ISSN-0971-720X (Print) • ISSN-0973-1283 (Electronic)

Volume 20, Number 3 July-September 2020

# Medico-Legal Update

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# Medico-Legal Update


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**Website: www.medicolegalupdate.org**



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Logix Office Tower, Unit No. 1704, Logix City Centre Mall,
Sector- 32, Noida - 201 301 (Uttar Pradesh)

**Printed, published and owned by**

**Dr. R.K. Sharma**
Institute of Medico-legal Publications
Logix Office Tower, Unit No. 1704, Logix City Centre Mall,
Sector- 32, Noida - 201 301 (Uttar Pradesh)

**Published at**

**Institute of Medico-legal Publications**
Logix Office Tower, Unit No. 1704, Logix City Centre Mall,
Sector- 32, Noida - 201 301 (Uttar Pradesh)

# Medico-Legal Update

CONTENTS

**Volume 20, Number 3** **July-September 2020**

1. Carbamate Poisoning – An Autopsy Study ..... 1
*Jinu.M, Thankamma.P.George, N.A.Balaram, Sujisha.S.S*

2. Profile of Burn Deaths: A Study based on Postmortem Examination of Burn Cases at R.N.T. Medical College, Udaipur ..... 8
*Akhilesh Sharma, Manish Kumar Sharma, Ashish Kumar Garg*

3. Psychological Autopsy: the Psychological Assessment of the Dead Individual's Role in the Death ..... 13
*Anand Kumar Vasudevan, Hanumantha, Lynne Eccleston*

4. Legality In Hospitals- Medico-Legal Case Management ..... 19
*Ashwini Pandit, Dhwani Patel, Arushi Chawla*

5. To Assess Association of Bullous Pemphigoid and Neurological Disorders- A Clinical Study ..... 24
*Balkrishna Pralhadrao Nikam, Dhanraj D Chavan, Nischhal Shrivastava*

6. To Assess Clinical Profile of Patients with Dermatophytosis Infection ..... 28
*Balkrishna Pralhadrao Nikam, Dhanraj D Chavan, Nischhal Shrivastava, Namita Narkhede*

7. The Study of Trends and Out Come of Acute Poisoning in a Tertiary Care Hospital Khammam, Telangana; India ..... 32
*Bharath Kumar Guntheti, Kondru Laxman*

8. Correlation between various Measurements of Sternum with Stature - An Autopsy based Study ..... 40
*Bhumesh Darade, Pawan Sabale, Shailesh Mohite, Swapnil Akhade, Chaitanya Kulkarni*

9. Assessment of Depression among the Housewives of Alcohol Consuming Husbands in Selected Community Areas, Kancheepuram District, Tamilnadu ..... 46
*Bhuvana.A, Ajaykumar.P, Yaazhini.T, Dineshkumar.S, Devaki. K*

10. A Study to Assess the Knowledge on Oral Health and Self Esteem among Young Adults in Selected College, in Kancheepuram District, Tamilnadu, India ..... 51
*Gini T.R , Ashika Parveen, Sharmilavathi.A, Avinash.U, Anto Benson, Shanthi*

11. Knowledge and Attitude of Final Year Medical Students Towards Dentistry and Dental Consultation: A Questionnaire-based Study ..... 55
*Girish Suragimath, Mrunal B Mohite, Ashwinirani SR, Sameer Zope, Siddhartha Varma*

12. Consensual Sexual Intercourse among children Vs Current Legal Provisions under POCSO: A Scientific Review with Prospective Quantitative Analytical Study ..... 60
*H. S. Tatiya, A. A. Taware, H. V. Vaidya, V. T. Jadhav, A. L. Bandgar, S. B. Punpale*

13. Assessment of the Psychological Wellbeing of Elderly Residing at Pooncheri Rural Community Area in Kancheepuram District, Tamilnadu, India ..... 66
*George Fernandez A, Janagiraman N, Shalini M, Vinitha R, Metha*

14. Effectiveness of Flax Seed Pillow on Stress and Physical Parameters of Premature Infants ..... 70
*Tessy Thomas, Sujatha R*

15. A Study to Examine the Association of Health Related Behaviours and Body Mass Index among Young Adults at Selected Colleges in Kancheepuram District, Tamil Nadu, India ..... 76
*J.Sherlinblessy, G.Santhiya, E.Mohan1, Shanthi*

16. Five Year Retrospective Study of Profile of Burn Deaths from Pune Region ..... 81
*Jadhao Vijay T, Bandgar Abhijit L, Taware Ajay A, Tatiya Harish S, Vaidya Hemant V*

17. Pattern of Poisoning Cases in a Tertiary Care Centre in South India - An Observational study ..... 86
*James Rajesh J, Sampath Kumar P, Priyadarshee Pradhan, Jothi Marie Feula A, Siva Reddy B*

18. Estimation of Stature from Footprint Length ..... 91
*Janarthanan R, Muthamizh Selvan*

19. Effect of Structured Exercise Programme on Functional Mobility in Parkinson's Disease ..... 96
*Joshi Madhura S., Kanase Suraj B.*

20. A Study to Assess the Knowledge on Pubertal Changes and Menarche among Adolescent Girls Residing in A Selected Rural Community, Kanchipuram District, Tamilnadu ..... 102
*Jyothish Lal Prasad, Abishek, Aishwariya, Ananthi, Cyril Cherian, Reshma Banu, L. Lakshmi*

21. For Effective, Earlier and Simplified Diagnosis of Retinopathy of Prematurity (RoP), a Probe through Digital Image Processing Algorithm in B-Scan ..... 105
*K R N Aswini, S Vijaya Raghavan, Sreekanth NP, Manju Sree RP*

22. Effect of Early Physiotherapy for Endotracheal Intubation Induced Temporomandibular Joint Dysfunction –Experimental Study ..... 110
*Krutika Dnyaneshwar Gawade, Sandeep Babasaheb Shinde, P.B. Jamale*

23. An Observational Study on the Sexual Assault Victims in the Year 2018 at Tartiary Health Care Center of Rajasthan ..... 117
*Mahendra Singh, R.K Punia, Deepali Pathak, Shashank Sharma*

24. Mob Lynching: A New Form of Hate Crime ..... 122
*Manoj Kumar Pathak, Srishti Rai*

25. Radiological Study of Appearance and Fusion of Iliac Crest in hip bone in Bikaner Region in 14-22 Years Age Group ..... 129
*Mathur Indubala, Sajjad Hussain, Bohra Bhavesh, Sharma Yogesh, Agrawal Anjali*

26. Abortion Laws in India: Issues and Challenges in 21st Century ..... 133
*Nitesh Bhatt, Pooja Suman*

27. Effect of Core Stability And Functional Mobility Exercises on Muscle Strength after Lumbar Spinal Cord Injury ..... 138
*Neha Y. Kakade, Suraj B. Kanase*

28. A Study to Assess Effectiveness of Jacobson Progressive Relaxation Technique on Sleep Quality among Elderly in Selected Old-Age Home of Kheda District.....144
*Patel Margi, Mayavanshi Rashmika, Pandya Rutu, Prajapati Nisha, Patel Vrutta, Khristi Linus, Patel Jay*

29. Awareness of Various Forms of Treatment Approaches in Stroke amongst Rural Population.....148
*Prajakta S.Kadam, Suraj B.Kanase*

30. Effect of Multidimensional Exercise Program for Improving Balance in Traumatic Brain Injury Patients.....155
*Pranali Kakade, Suraj B Kanase*

31. Traumatic Spinal Injuries: An Autopsy Study at Tertiary Health Care Center of Rajasthan During the Year 2017-18.....162
*R.K.Punia, Sanjay Achra*

32. An Analysis of Trends of Homicidal Deaths in Western Mumbai Region .....168
*Rajesh B. Sukhdeve, Sachin S. Sonawane, Shashank Tyagi*

33. Evaluation of Perception of II Year MBBS Students Regarding A Clinical Forensic Medicine Module in a Tertiary Care Centre .....174
*Ravindra Baliram Deokar, Harish Manilal Pathak*

34. A Retrospective Study to Determine the Type of Offence Committed by the Juveniles in the Reformatory Schools of a Capital City of India .....180
*Richa Choudhury, Neeharika Mishra, Pradeep Kumar Yadav*

35. Prevalence of Addiction among Tuberculosis Patients .....185
*Richa Choudhury, Shobhit Shakya, Pradeep Kumar Yadav, Hemant Kumar*

36. A Cross Sectional Autopsy based Study of Homicidal Deaths in Vijayapura, Karnataka.....191
*Siva Kumar V, Tejas J, Shruthi. K. Sivakumar*

37. A Descriptive Study on Alleged Sexual Offenders in South Bangalore .....196
*Sujatha P. L, Ananda. K, Mandar Ramchandra Sane*

38. Pattern and Nature of Fatal Blunt Force Homicidal Injuries and Its Correlation with the Weapon.....201
*Sujith Sreenivas C*

39. Prevalence of Odontogenic Cysts and Tumors – A Clinicopathological Study .....207
*Sushruth Nayak, Asha Karadwal, Prachi Nayak, Kush Pathak*

40. A Study of Over-The-Counter (OTC) Drug Usage Pattern among the Patients attending a Medical College Hospital .....211
*Tejasvi.P.K, Magendran.J*

41. Tobacco Toxicity in Tobacco Chewers .....217
*V. Chandrasekhar*

42. Study of Temporary Trends in The Pattern of Poisonings in a Tertiary Care Hospital.....221
*V.K.Sowmithra, Magendran.J*

43. Amputation of Penis Due To Electrocution- A Case Report ..... 228
*Vedant Kulshrestha, Mohammad Amjad*

44. Towards Digital Diagnosis of Oral Cancer: A Study on Optimum Preferences of Histopathological Techniques and Features ..... 232
*Tabassum Yesmin Rahman, Lipi B. Mahanta, Anup K Das, Jagannath D Sharma*

45. Trauma to the Thoracic Cage – An Autopsy Study ..... 239
*Thankamma P. George, K. Sreekumari, Sreedevi C. S.*

46. Evaluation of the Cookies Formulated with ***Costus igneus*** Plant Material for Antidiabetic Activity ..... 246
*A. Rajani Chowdary, Raaththika R, Payala Vijayalakshmi*

47. A Study to Assess the Effectiveness of Training Program on Knowledge and Practices Regarding Advanced Cardiovascular Life Support (ACLS) among Staff Nurses in MMIMS & R Hospital ..... 253
*Alka Walia, Simaranjit Kaur, Vinay Kumari*

48. Punjabi Adaptation of WHO's Global Physical Activity Questionnaire (GPAQ) in Gurumukhi Script: A Validity and Reliability Study ..... 257
*Harmandeep Singh, Sukhdev Singh, Amandeep Singh*

49. Management of Oroantral Communication Using Double Layered Closure with Buccal Fat Pad and Buccal Advancement Flap: Prospective Randomized Clinical Study ..... 264
*Kumar Nilesh*

50. Information Booklet on Self-Care Management of Chemotherapy among gynecological Cancer Survivors at Selected Hospital, Mangalore, Karnataka ..... 269
*Shynee Paul, Jacintha Veigas*

51. Effect of Yoga Therapy on State and Trait Anxiety in Perimenopausal Women: A Non-Randomized Controlled Study ..... 273
*Abhishek Chaturvedi, Asha Kamath, Gayathry Nayak,, Anjali Rao*

52. A Clinical Study of Complicated Inguinal Hernia with Special Reference to Its Management ..... 279
*Pulin Ch Kumar, Paul Pratik*

53. A Comparative Study of Medical Termination of Pregnancy Act, 1971 with Recent Medical Termination of Pregnancy (Amendment) Bill, 2020 Through Judicial Pronouncement ..... 284
*Pyali Chatterjee*

54. Effect of Kangaroo Mother Care on Physiological Parameters of Low Birth Weight Babies Admitted in NICU ..... 290
*Pratibha Thakur, Jyoti Sarin, Yogesh Kumar*

55. Perception of Medication error among Interns and Staff Nurses in a Selected Hospital at Mangaluru- A Mixed Method Approach ..... 298
*Pavithra K, Latha S, Gincy Joseph, Sujatha.R , Jyothi Rao*

56. Knowledge of Antenatal Mothers Regarding Human Milk Banking ..... 305
*Philomena Fernandes, Sabitha Nayak*

57. A Study on Occupational Health Psychology of Employees in IT Sector in Ahmedabad City ..... 313
*Pranav Saraswat*

58. Acupressure– A Review with a Current and Future Prospective in Dentistry ..... 320
*Dharnappa Poojary, Diksha Singh, Rubina Anjum, Dieu Thuy Dao, Shailesh Kudva*

59. Does Cerclage wiring with Intramedullary Nailing in Subtrochanteric Fractures Improve the Final Outcome? ..... 326
*Rajendra Annappa, Surendra Umesh Kamath, Sunil Lakshmipura Krishnamurthy, Sharan Mallya, Krithika Kamath, Pooja Kundapur Suresh*

60. Effect of Acupressure on Anxiety among Patients Undergoing Hemodialysis in Selected Hospitals of Ambala, Haryana: A Randomized Controlled Trial ..... 332
*Jimmy Dharwal , Srinivasan.P, Kanika, Jyoti Sarin*

61. Self Esteem and Peer Group Relationship of Adolescent Children in Single Parent Families ..... 339
*Anjaly Mohan, Priya V*

62. Skin Cancer Classification Using Dermoscopic Images based on Ranklet Transform, Co-occurrence Features and Random Forest Classifier ..... 344
*Chithra Devi M*

63. Melanoma Skin Cancer Classification Using Deep Learning Convolutional Neural Network ..... 351
*S. Mohan Kumar, J. Ram Kumar, K. Gopalakrishnan*

64. Cluster Analysis for MRI Brain Tumor Segmentation ..... 356
*M. Rajmohan, M. Abraham, D. Sahaya Lenin,P. Pandiaraj*

65. Effect of Posture on Electrical Axis of Heart During Different Phases of Breathing in Normal Subjects 362
*H. Vishnu Priya, S. Krishnan, Prem B*

66. Effectiveness of Guided Imagery on Stress and Coping among Wives of Alcoholics- A Quasi Experimental one Group Pre-Test Post-Test Research Design ..... 367
*Aarti, Srinivasan.P, Manpreet Sharma, Jyoti Sarin*

67. Predicting the Existence of Brain Tumor in Mri Images by Applying FCNN ..... 375
*Sylvester Ranjith F, Parveen Sultana H*

68. Effect of Video based Teaching on Knowledge and Attitude regarding ADHD of Children among Primary School Teachers ..... 381
*Vijyeta Bhasin, Srinivasan P., Uma J. Deaver, Jyoti Sarin*

69. Illegalities and Infirmities in Implementation of 'Ex-Servicemen Contributory Health Scheme: Public Audit Findings and Other Irregularities - An Analytical Study ..... 389
*Bhupal Singh, Asha Verma*

70. Attitude of Dental Faculty on Admissions to Dental Colleges through National Eligibility cum Entrance Test (NEET) - A Knowledge, Aptitude and Perspective Survey ..... 394
*Saloni Kachhara, Deepak Nallaswamy, Subha M*

71. Difference in the Academic Performance of NEET and NON-NEET batch- A Cohort Study At Saveetha Dental College ..... 401
*Saloni Kachhara, Deepak Nallaswamy, Subha M*

72. Effect of NEET based Selection Process on the Academic Outcome of Students Pursuing Dentistry - A Cohort Study at Saveetha Dental College ..... 407
*Saloni Kachhara, Deepak Nallaswamy, Subha M*

73. Medical Device Prototype for Planter Intrinsic Muscles: A Scientific Note ..... 412
*Amit Sharma, Priyanshu V Rathod*

74. Fire Safety Related Challenges Faced by Existing Hospitals: A Review ..... 419
*Abdul Hakim Choudhary, Mohammad Kausar, Sidhartha Satpathy, D. K. Sharma*

75. Body Mass Index, Modified Bishop Score and Transvaginal Sonographic Measurement of the Cervical Length as Predictors of Successful Induction of Labour by Misoprostol ..... 426
*Basma Mohamed, Omaima Idris, Noura El-Nassery, Mazen Abdel-Rasheed, Osama Azmy*

76. In Potential Siliko Simulation of Clorogenic Acid in ***Coffea canephora*** to Transfering Macrophage Polarization of M1 in Tuberculosis Infection ..... 432
*Christina Destri , Jusak Nugraha, Muhammad Amin, Djoko Agus Purwanto*

77. Molecullar Docking of Epigallocatechin-3-gallate (EGCG) on Keap1-Nrf2 Complex Protein in Photoaging Prevention ..... 439
*Damayanti, Cita Rosita Sigit Prakoeswa, Djoko Agus Purwanto, Anang Endaryanto, Siswandono*

78. The Effect of Buzz Group Modification Method on Exclusive Breastfeeding Against Self Efficacy in Pregnant Women: A Quasi Experiment ..... 446
*Febyana Dwi Cahyantia, Lailatun Nimah, Retnayu Pradaniea*

79. Tobacco Smoke and Pregnancy Outcome: Literature Review ..... 452
*Haerani Harun, Anwar Daud, Veni Hadju, Ridwan Amiruddin, Anwar Mallongi, Rosmala Nur*

80. Identifying and Revealing Active Compound from Green Tea (***Camellia sinensis***) for Curing Systemic Lupus Erythematosus by Acting as CASPASE 1 Inhibitor ..... 457
*Herin Mawarti, Jusak Nugraha, Djoko Agus Purwanto, Joewono Soeroso*

81. Herpes Virus, Causes of Infections and Preventive Methods ..... 464
*Huynh Tan Hoi*

82. Association between Inactive-Gymnastics and Active-Gymnastics Elderly towards Cognitive Functions Measured by The Mini-Mental State Examination (MMSE) ..... 470
*Muhammad Hamdan, Raini Wisnujono, Yudha Haryono, Abdulloh Machin, Ichwanuddin*

83. The Politics of Judicial Law in the Development of the National Health Law ..... 476
*Irfan Nur Rachman, Arief Hidayat, and Lita Tyesta*

84. Pattern of Fatal IntraAbdominal Injuries in Autopsy Cases- A 3 Year Retrospective Study ..... 481
*Khaja Azizuddin Junaidi, Kashif Ali*

85. ARM Diagnosis with Distal Colostography on Anorectal Malformations ..... 486
*Naely Rahma, Bambang Seprijanto*

86. Multiplanner Measurement to the Clicked Tempromandibular Joint (Condylar Process and Articular Dick) with Conbeam Computed Tomography ..... 491
*Nameer Fadhel, Manar Abd Alrazaq Hassan, Nour Abd Alrazaq Hassan*

87. Performance of the Health Cadres in Children's Growth and Development Monitoring Program after Training in the Working Area of Public Health Services of Abiansemal II, Badung, Bali ..... 498
*Ni Wayan Armini, Gusti Ayu Marhaeni, I Gusti Ayu Surati, I Putu Suiraoka*

88. The Effect of Re-unification Education on Empathy and Multicultural Competence of Nursing-College Students ..... 505
*Myoungsuk Kim, Gie-Ok Noh, MJ Park*

89. Assessment of Health Status of Children with Cancer who Undergo Chemical Therapy ..... 511
*Kareem Ghadhban Sajem*

90. Effects of Onion Extract on Hepar Histopatology in Alloxan-Induced Diabetic Rattus Novergicus ..... 517
*Ni Komang Aprilina Widi Suputri, Ajik Azmijah, Retno Bijanti, Made Mahaguna Putra*

91. Inclusive and Sustainable Healthcare Delivery-A Public Private Participatory Model ..... 525
*Nimble O J, A.V.Chinnasamy*

92. Factors Analysis Related to the Completeness of Providing Basic Immunization in Infant Aged 12 Months ..... 531
*Hannik Rahmaningrum, Harmayetty, Deni Yasmara, Ilya Krisnana*

93. The Effect of Soot Particulate towards Vascular Cell Adhesion Molecule-1 (VCAM-1) Expression in the Mechanism of Cardiovascular System Disruption ..... 538
*Edmond Leonard, Muhammad Aminuddin*

94. The Role of Universal Health Coverage in Supporting National Family Planning Program: A Comparative Study ..... 544
*Erni Rosita Dewi, Muhammad Ardian Cahya Laksana, Nur Anisah Rahmawati, Alifia Candra Puriastuti, Budi Prasetyo*

95. A Study to Assess the Level of Knowledge on Ill Effects of Mobile Usage among Adolescents in Selected College at Kancheepuram District, Tamilnadu, India ..... 550
*Renuga S, Alfred Sam D, Dinesh.J, Keerthi.G, Parasuraman P, Vijay S, N.Thivya*

96. Learning of Patient Identification in Patient Safety Programs Through Clinical Preceptor Models ..... 553
*Roymond H. Simamora*

97. Effectiveness of Structured Teaching Programme on Pulmonary Rehabilitation among Patients with Chronic Obstructive Pulmonary Disease ..... 557
*S.Eswari, Pushpakala K.J*

98. Nicotine Adds Risk Factors to the Cardiovascular System and Increases Mortality and Sudden Cardiac Arrest ..... 563
*Salah Abd- Al kader Omran; Abstract*

99. The Effect of Abuse of Some Anabolic Steroids on Hormonal and Testicular Function in Male Rats ..... 569
*Salah M.M. Al Chalabi Rashaa F. Abdul-Lattif and Haylim N. Abud*

100. Study of a Hormonal Assay in PCOS Patients with Type 2 DM and their Correlation with Inhibin B .... 575
*Huda Hameed Hassan, Suaad Muhssen Ghazi Aufaira Shaker Nasif*

101. Estimation the Scavenging Activities of Ascorbic Acid, Uric Acid, Gallic Acid and GSH to DPPH Radical .... 581
*Ali M.A. Al-Kufaishi*

102. Histological Investigations for Cordia Myxa During the Treatment of Gastritis in Local Rabbits.... 587
*Hussein Bashar Mahmood, Ghassan A Dawood, Ali Fayadh Bargooth*

103. Frequency of Aspirin Misuse Among Hypertensive Patients in Babylon Province .... 591
*Zahraa Fattah Ghani, Oday Jasim Alsalihi , Mustafa Shakir Mahmood*

104. Estimation of Antioxidants Activity Through DPPH Inhibition Levels in Patients with Chronic HPV 16 Cervicitis .... 598
*Ali M. A. Al-Kufaishi, Lamia A. M. Al-Mashhedy, Bushra Jaber Al-Rubaie*

105. Estimation of Some Genetic and Physiological Variables of Iraqi Desert Snake ***Cerastes gasperettii*** ... 603
*Samir M. Khalaf, Haitham L. Abdulhadi, Banan R. Dabdoub, Luay H. Ali*

106. Evaluation of Soluble PD-1 and PD-L1 in Iraqi Type 2 Diabetes Mellitus (T2DM) Patients with Chronic Toxoplasmosis .... 609
*Farah E. Mohammed , Ali N. Yaseen, Muhammed A. H. Aldabagh*

107. Clinical Variants of Rosacea in Iraqi Patients .... 616
*Ahmed Abdulhussein Kawen, Hussein Abbas Al-Sultany*

108. Assessment of MR-ProADM and N-Terminal B-Type Natriuretic Peptide of Serum Levels in Patients with Heart Failure. .... 621
*Ahmad abd alraheem Ibrahem Dahy; Walaa Al-Jedda , Abbas Al-Sharifi*

109. Effects of Two Different Doses of Vitamin B2 and a Single Dose of Vitamin B12 Against Cyclophosphamide Induced Nephrotoxicity.... 627
*Waleed K. Ghanim, Nada N. Al-Shawi, Muhsin S. G. Al-Moziel1*

110. Investigating the Effect of ***Lymnaea auricularia*** (snail) Powder on Different Species of Pathogenic Bacteria .... 634
*Sally Hani Abdul-Khaliq, Nebrass Faleh Chachain, Raghad Abdulatif Abdurazaq*

111. Effects of Simvastatin and/or Metformin Administration on Lipid Profile and Reproductive Function in Adults Male Rats .... 640
*Muhsin S.G. Al_Mozie'l [1], Abbas A. Khudhair, Noora S. Ghalib*

112. Parkinson's Disease Follow Up Self-Assessment Scale.... 647
*Kifah K. Al- Ubaidy, Aiyar Shakir, Basim Abdulelah Ali*

113. Dental Caries among Mental Patients in Kerbala-Iraq in 2019 .... 654
*Yaseen, Nabeel, Al Haydari, Amer, Al Mousawi, Ali*

114. Treatment of Iraqi People with Hyperkinetic Movement Disorders by Tetrabenazine in Relation to Genetic Polymorphism of CYP450 2D6 .... 660
*Zainab A. Abbood , Shatha H. Ali Nawfal M. Sheaheed*

115. New Record of the Genus Hydrotaea Robineau-Desvoidy, 1830 (Diptera, Muscidae) from Kerbala City, Iraq ..... 667
*Haider Naeem Al-Ashbal , Rafid Abbas Al-Essa , Hanaa H. Al-Saffar*

116. Effect of Aerobic Training on Selected Cardiopulmonary Parameters in Myocardial Infarction Patients with Stroke ..... 673
*Zeezy Soliman Eraky, Nesreen Ghareb El-Nahas, Naguib Mohamed Salem, Samir Abdelfattah El-gazar, Ahmed Ali*

117. Effects of Perceived Health Condition, Gerotranscendence, and Wisdom on Successful Aging of Elders ..... 681
*Hee Kyung Kim*

118. Association of Terminal Complement Complex (TCC), Prostaglandin (PGj2) among Patient with First Episode Psychosis (Case-Control Study) ..... 688
*Rana Fadhil Obaid, Rasha Fadhel Obaid, Sumeiya Mahdi al Har*

119. Perception of Medical Health College Students Toward Mental Health ..... 695
*Wiwik Widiyawati, Ah Yusuf, Indra Fajar Ibnu*

120. The Correlation between the Characteristic of Reflux Based on 24 Hours-Multichannel Intraluminal Impedance- Ph Monitoring with the Quality of Life of Refractory Laryngopharyngeal Reflux Patients . 701
*Muhammad Amsyar Akil, Risma Sari Ayu Hasroni, Abdul Kadir, Fardah Akil*

121. Tympanogram and Audiogram Presentation after Tympanomastoidectomy Surgery Using Musculus Temporalis Fascia Profunda Graft and Composite Graft ..... 708
*Sandrianto Lande, Riskiana Djamin,Sutji Pratiwi Rahardjo*

122. Risk Factors of Lung Tuberculosis Occurence in the Working Area of Kaluku Bodoa Health Center Makassar City ..... 714
*Stang, Anwar Mallongi, Indra Dwinata, Sumarni*

123. Difference of Predisposing Factors with Notification Pulmonary TB through Rapid Moleculer Test and Specimen Transportation Method of TB Health Centre Staff ..... 720
*Tukiman, Syarifah, Hiswani*

124. The Influence of Duration, History of Contact and BMI on the Incidents of Pulmonary TB in patients with DM ..... 725
*Sorimuda Sarumpaet, Evawany Aritonang, Syarifah*

125. Analysis Relationship of the Pulmonary TB Prisoners with the Prevention Measures in Jail In Province of Sumatera Utara ..... 729
*Lina Tarigan, R. Kintoko Rochadi*

126. The Influence of Distance from Health Facility, Family Number at Home and TB History in Starting Treatment of MDR-TB in Medan ..... 736
*R. Kintoko Rochadi, Erna Mutiara*

127. The Influence of Education, Existence of Sufferers, and Ventilation with TB Incidence in Batak Etnics in Pematang Bandar Health Centre ..... 740
*Alam Bakti Keloko, Lina Tarigan*

128. Proximate Characteristics and Nutritional Value of White Anchovy Flour ..... 744
*Hendrayati, Theresia Dewi KB, Laras Budyghifari, Adriyani Adam*

129. Distribution of RNA M. Leprae Household Contact in Endemic Area Indonesia ..... 750
*A. Rizki Amelia*

130. Analysis of Environmental Risk Factors and Treatment Efforts Malaria Import Patients in Puskesmas in the Work Area of District Health Center of Segeri, Pangkep Regency 2019 ..... 757
*Mugfira Mayangsari Putri, Hasanuddin Ishak, Indar, Anwar Mallongi*

131. Formulation and Effectiveness Test of Matoa Stem (Pometia Pinnata) Skin Extract Cream Combination of Honey on Staphylacoccus Aureus Bacteria ..... 763
*Norma*

132. Relationship between Level of Knowledge of Childbearing Age Women About Cervical Cancer and Behavior of Preventing Cervical Cancer in Mayamuk District, Sorong Regency ..... 770
*Sunaeni, S.ST, M.Keb*

133. The Affectivity of Knee and Hip Muscle Strengthening Exercise to Improve Muscle Strength, Balance, Pain, and Functional Activity of People with Osteoarthritis ..... 775
*Djohan Aras, Fatimatuzzahrah Syarif, Natalia Toding Padang, Nurhikmawaty Hasbiah, Herdin Rusli, Ita Rini*

134. Quinone Oxidoreductase 2 Serum Level that affecting the Psychotic Disorders of Methamphetamine Abusers ..... 782
*Dany H. Ludong, A. Jayalangkara Tanra, Mochammad Hatta, Sonny T. Lisal, Ismail Fikri, Reza Nasution, Tri Supartini*

135. Application Pis (Indonesia Wellness Progrsam) PK Model with Decision and Matriarchal Patriarchal Family of Compliance on the Family of the Suffering of Disease TB Lung Health in the Work Remu City Sorong ..... 788
*Maria Loihala*

136. Decompression Sickness Indicators in Traditional Divers in Bajo, Boalemo District ..... 794
*Syamsiar S. Russeng, Lalu Muhammad Saleh, Muhammad Syafar Muliadi Rais*

137. The Coparation between Exclusive Breastfeeding and Infant's Development at the Age of 6 Months in Rskia Pertiwi Makassar South Sulawesi Indonesia ..... 800
*Sundari, Andi masnilawati, Daswati, Lina Fitriani, Sitti Hadriyanti, Sumiaty, Nurlina Akbar*

138. Effects of Classical Music Therapy on Anxiety Level of Caesarean Section Mother ..... 806
*Sumarni Marwang, Rosita Passe, Rosdianah Aswan, Nurhidayat Triananinsi, Nahira Iskandar, Fadjriah Ohorella, Sumarni Sikki*

139. Effectiveness of Baby Spa and Music Therapy on Growth and Development of Baby ..... 811
*Sri Handayani, Anwar Mallongi*

140. The Role of Kamoro Traditional Leaders in Communities Empowerment and Health in Mimika District ..... 817
*Vince Tebay, Anwar Mallongi*

141. Effect of Brown Algae Extract Sargassum sp on Malondialdehyde Levels in White Rats (Rattus Norvegicus) Pregnant Wistar Strains ..... 822
*Dahniar, Suryani As'ad, Nasrudin A.Mappeware, Gemini Alam, Budu, Rosdiana Natzir, Burhanuddin Bahar*

142. Factors Corresponded to Health Service Utilization of Chronic Disease Management Program (Prolanis) Patient in Health Center Lateri Ambon City Post-Earthquake ..... 828
*Ervina Imelda Souhaly, Muhammad Alwy Arifin, Darmawansyah, Amran Razak, Anwar Mallongi, Syamsuddin Wadi, Muh. Yusri Abadi*

143. The Influence of Occupational Safety and Health on Job Satisfaction and Organizational Commitment of Hospital Nurses in Makassar City ..... 834
*Andi Niartiningsih, Irwandy, Masyitha Muis*

144. Influence of Iur Cost to Patient Satisfaction through Customer Value patients BPJS Hospital in South Sulawesi Province ..... 840
*Marwah Thaha, Amran Razak, Indar, Fridawat Rivai*

145. Health Education Influence the Maybrat's Women Early Cancer Cervical Detection ..... 847
*Yowel Kambu, Simon Lukas Momot*

146. Snowball Education Method Effect the Family Support for Plwha Art's Adherence ..... 852
*Oktovina Mobalen, Yowel Kambu : Absract*

147. Analysis the Influence of Job Embeddednes and Work Engagement on Improving Employee Performance in Rsud Haji of South Sulawesi Province in 2020 ..... 857
*Noviani Munsir, Irwandy, Syamsuddin*

148. Study of Tobacco Smoke and Pregnancy Outcome ..... 864
*Haerani Harun, Anwar Daud, Veni Hadju, Ridwan Amiruddin, Anwar Mallongi, Rosmala Nur*

149. Environmental Factors and Use of Protective Personal Equipment for the Prevention of Covid-19 in 3 Large Cities in Indonesia (Jakarta, Surabaya and Makassar) ..... 869

150. The Influence of Body Image towards Self-Esteem, Self-Compassion and Psychological Well-Being in Female Exerciser ..... 876
*Namora Lumongga Lubis, Hasnida, Anwar Mallongi*

151. A qualitative Study of Accessibility Health Services among Communities on Small Islands in Makassar City ..... 882
*Alfiah Ramadhani Amran, Muhammad Alwy Arifin, Muhammad Syafar*

152. Environmental Pollution and Health Problems Due to Forest Fires with Co2 Parameters ..... 888
*Anwar Mallongi, Rusydi Indra, Muh. Kamil Muh. Arief, M. Fais Satrianegara*

153. The Effect of Giving Date Palm Juice on the Duration of the First Stage of Labor in Sele Be Solu Hospital, Sorong City ..... 893
*Ariani Pongoh, Niken Kumala Budi, Sri Ayu Dawam*

154. Food Management System and Satisfaction Level of Students of Pesantren Tebuireng Jombang, East Java ..... 899
*Mustamir Kamaruddin, Anwar Mallongi*

155. Macronutrient Intake of 6-11 Months Old Infant on Mothers Obtaining Moringa Leaves and Iron Supplements ..... 907
*Sumiaty , Abdullah Tahir , Bahar Burhanuddin , Jafar Nurhaedar, Hadju Veni, Syafar Muhammad, MasyitaMuis , Sri Sumarmi*

156. The Effect of Moringa Oleifera on the Life Outcome of Pregnant and Breastfreeding Mothers: Literature Review ..... 914
*, Nur Ulmy Mahmud, Tahir Abdullah, Arsunan, A.A, Burhanuddin Bahar, Veni Hadju, Muhammad Syafar*

157. Analysis of Drug Logistics Planning at Medical Management Agency in Ambon City Health Office (Qualitative study) ..... 920
*Jakobis Lewier, Darmawansyah, Muhammad Alwy Arifin, Sukri Palutturi, Anwar Mallongi, M. Furqan, Dian Saputra Marzuki*

158. The Influence of Individual Characteristics on the Performance of Nutrition Program in Ambon City Public Health Center ..... 926
*Horib, Darmawansyah, Sukri Palutturi, Amran Razak, Yahya Thamrin, Rahmatia Yunus, Nurhayani, Anwar Mallongi*

159. Analysis of Ability and Willingness to Pay Patients in Psychiatric Clinics (Special hospital case study in Maluku Province) ..... 932
*Mega Aziza, Darmawansyah, Indar, Muhammad Alwy Arifin, Syamsiar S Russeng, Rahmatia Yunus, Muhammad Al Fajrin*

160. Factors Corresponded to Health Service Utilization of Chronic Disease Management Program (Prolanis) Patient in Health Center Lateri Ambon City Post-Earthquake ..... 937
*Ervina Imelda Souhaly, Muhammad Alwy Arifin, Darmawansyah, Amran Razak, Anwar Mallongi, Syamsuddin Wadi, Muh. Yusri Abadi*

161. The Effect of Work Discipline on a Employee Performance (The Health Office Case Study of Tanimbar Island) ..... 943
*Edy Slamet Kelibulin, Sukri Palutturi , Muhammad Alwy Arifin, Indar, Yahya Thamrin, Stang, Suci Rahmadani*

162. Analysis Health Information Systems Quality on the Effectiveness of Public Health Center Officers in Ambon City ..... 948
*Erwine Senda N Wattimena, Amran Razak, Sukri Pallutturi, Darmawansyah Muhammad Syafar, Lalu Muhammad Saleh, Suci Rahmadani*

163. Juvenile Treatment Model according to Juvenile Criminal Justice System in the LPKA (Juvenile Detention Center) Class I, Tanjung Gusta, Medan ..... 954
*Madiasa Ablisar, Marlina*

164. Factors Related to the Existence of Aedes Aegypty Larvae in Endemic and Non Endemic Areas in Makassar City ..... 959
*Erniwati Ibrahim, Jusnita, Syamsuar Manyullei, Anwar Mallongi*

165. Analysis of Cost Sharing on the Satisfaction of NHI Patients Not Contribution Beneficiaries (Case Study of Passo Hative Hospital in Ambon City) ..... 965
*Yoki Stefanus, Darmawansyah, Muhammad Alwy Arifin , Indar, Syamsuar Manyullei, Ansariadi, Dian Saputra Marzuki*

166. Estimation of Some Immunological and Biochemical in the Patients with Systemic Lupus Erythematosus in Males and Females in Baghdad ..... 972
*Dua'a Akram AL-Atabi, Bushra F. Hasan, Ali H. AL-Hafidh*

167. Impact of Food Simulants Material on Orthodontic Bond Strength after Application of Caries Infiltrant Resin (In Vitro Study) ..... 979
*Ahmed Muhsin Yousif AL-Mayali , Mohammed Nahidh, Hayder A. Kadhim, Ali Hadi Fahad*

168. Antibacterial Activity of Selected Fractions Extract of Coptis chinensis Franch Rhizomes ..... 985
*Reyadh R Al-Rashidi, Hisham Al-Shaikhli, Rusul A Alsaray, Tahrani Munusamy, Radhi K. Obaid*

169. Therapeutic Effect of Chemically Synthesized Silver Nanoparticles on Aphthous Stomatitis in Some Iraqi Patients ..... 991
*Zahraa Neamah Abbas, Nafal NazarBahjat*

170. Evaluation of Serum Leptin, Interlukein–6 and some Biochemical Parameters in Iraq obese Adult Patients ..... 996
*Salwa Gahzi Turki, Asmehan Adnan AL- Naqeeb, Zahid Jasim Muhammed, Wesam Hameed Ahmed*

171. Estimation The Scavenging Activities of Ascorbic Acid, Uric Acid, Gallic Acid and GSH to DPPH Radical ..... 1003
*Ali M.A. Al-Kufaishi*

172. Frequency of Aspirin Misuse among Hypertensive Patients in Babylon Province ..... 1009
*Zahraa Fattah Ghani , Oday Jasim Alsalihi , Mustafa Shakir Mahmood*

173. Estimation of Antioxidants Activity Through DPPH Inhibition Levels In Patients with Chronic HPV 16 Cervicitis ..... 1016
*Ali M. A. Al-Kufaishi, Lamia A. M. Al-Mashhedy, Bushra Jaber Al-Rubaie*

174. Postoperative Hypothermia in Surgical Patients at Azadi Teaching Hospital ..... 1021
*Anas Amer Mohammad, Mehvan Jameel Ahmed,*

175. Histological and Biometric Study of the Effects of Fusarium Graminarum Silver Nanoparticles on the Kidney in Male Albino Mice ..... 1028
*Sahar A. H. AL-Sharqi*

176. Assessment Hormonal Disorders of Women in Oral and Vaginal Changes ..... 1036
*Karama M.T AL-Nuaimy*

177. A Difficulty Chart for Estimation of Treatment Duration of Palatally Impacted Canines ..... 1040
*Riyadh A. Ruwiaee, Dhuha A. Al-Ali, Mushriq F. Abid*

178. Histological and Enzyme Histochemical Changes of Liver Induced By the Action of Maxxthor Insecticide in Male Albino Rats ..... 1047
*Entesar A. Essa, Sahar A.H. AL-Sharqi , Jabbar H. Yenzeel, Layla J. Mohammed*

179. The Nature of the Il17 Cytokine Response In Rabbits Prime-Boosted With Eschrchia Coli-Pseudomonas Aeruginosa Prototype Bacterin Combinations.....1054
*Ibrahim Ms Shnawa, Ferial Abd*

180. Effect of Hearing Impairment on Behavior and Communication of Children in Schools and Special Education Centers in Mosul City.....1060
*Hana A. Al-saeed Rabei M. Al-dobooni*

181. Molecular Identification of Pathogenic Klebsiella Pneumoniae Strains Producing Biofilm .....1068
*Omer N. Abbas, Ahmed A. Mhawesh , Abdulwahid B. Al-Shaibani*

182. Molecular Localization of Human Papilloma Viral 16/18 DNA in Adenoctomized Tissues from a group of Iraqi Patients .....1075
*Taghreed F. Almahbobi; Mustafa Jaffar Hussien, Zainab A. Hamid, Shakir H. Mohammed Al-Alwany Saad Hasan Mohammed Ali*

183. Roles of Brain-Derived Neurotrophic Factor (BDNF) In Developing Jaw.....1082
*Noor Natik Raheem, Mohammed Faris, Athraa Y. Al-Hijazi, Ali I Alqurshi*

184. Serum and Salivary Immunoglobulins levels in Tobacco Smokers of Baghdad Governorate.....1088
*Shatha F. Tariq, Raghad N. Shihab*

185. Association of Retinol Binding Protein-4 and Microalbuminuria and Blood Glucose Regulation in Type 2 Diabetic Iraqi Patients.....1094
*Thair Lateef, Ali Abdulhussain Kasim*

186. Assessment of Nurses Knowledge Toward Neonate with Birth Asphyxia at Neonatal Intensive Care Unit in Pediatric Hospitals at Babylon Governorate .....1099
*Salim Amir Yousef, Abdul Mahdi Abdul Ridah Hasan*

187. Evaluating the Concentration of Cotinine, Lead and Cadmium in Newborns with Respsiratory Distress Syndrome .....1105
*Hiba Hussein Ali , Ali Faris Hassan, Hayder Hussein Alzubaidi*

188. Synergistic Effect of Some Natural Substances in Combination with Antibiotics on MDR Klebsiella isolates .....1112
*Mohammed Shaker Mahmoud Alani, Laith Musleh Najeeb Al Nuaimi*

189. Assessing the Response of a Sample of Iraqi Asthmatic Patients to Different Medication Regimens ...1119
*Ali L. Jasim, Eman S. Saleh, Mustafa N. Abd Ali*

190. Experimental Study of Prepared Killed Vaccine For S. Aureus in Local Rabbits.....1127
*Mohammad Hamid Kareem, Rafid Khalid Ali , Shireen Jameel Khaleel , Mustafa Salah Hasan, Eman Naji Saleh*

191. Evaluation of Serum Leptin Level in Correlation with CRP in a Sample of Iraqi Patients with Inflammatory Bowel Disease at Gastroenterology and Hepatology Teaching Hospital .....1133
*Ali S. Musa Al Shammaa, Ghaith Sael Mohammed Ali Haitham Kaddouri Hussein*

192. Influence of Quality of Nursing Work Life on Nurses' Turnover Intention: the Mediating Effect of Organizational Commitment.....1140
*Hyoungshim Choi, Insook Kim, Yeongyi Yim, Seonae Won*

193. The Role of Aspiration and Thyroxine Suppression Therapy in Management of Benign Thyroid Nodules ..... 1147
*Jalil Ibrahim Awaid alrubaye; Hussein Ali Abed Ahmad ; Salah Mahdi Tager*

194. Assessment of Risk Factors of Lung Cancer Patients in Babylon Governorate ,Iraq ..... 1154
*Ali Abdullah Jasim, Basim Hussein Bahir*

195. Preparation & Characterization of Some Poly Ester-Amide as Drug Polymers..... 1159
*Abeer Abdul RazakMohammed; ManalAzat Aziz*

196. Correlated of Some Parameters of Placenta and Umbilical Cord with the Newborn Baby ..... 1165
*Saif Kamel Mohammed; Saad Ahmed Al-Rawi; Samira Abdul Hussein Abdullah ; Nihad Khalawe Tektook*

197. Treatment of Retained DJ(neglected DJ) in AL-Anbar Government, A Postconfict Study..... 1171
*Omar Mahmood Shakir; Dhia A.Kareem ; Ameel Farooq Al Shawi , Wafaa Khalel Ibrahim*

198. The Association of Raised Mid-trimester Serum Human Chorionic Gonadotrophin (hCG) and Alpha-Fetoprotein with adverse Pregnancy Outcome ..... 1179
*Marwa Hamood Jabir, Taghreed Salah Alquzwini*

199. Evaluation of the Immune Response in Scabies Patient (Ordinary and Prisoners) Treated with Permethrin 5% ..... 1185
*Kawther Omran Hashim, Maan Abdul Aziz Shafiq, Hazima Mossa Al-Abassi, Majid Mohammed Mahmood*

200. Association of birth Spacing with birth weight in Baghdad City ..... 1192
*Buthaina Ateyah Rashid; Shaymaa Hadi Najm ; Aws Azmi Shakir*

201. Knowledge of Mothers Regarding Measles Control in Primary Health Care Centers in Al- Samawa City..... 1200
*Salwan Abdullah Naji , Khadija S. AL-Mizury, Shatha K. Atrah*

202. Correlation of Ki 67, Histopathological Features and Shape of Lesion in Skeletally Mature Osteochondroma ..... 1211
*Wafaa Redha Mohammed Al Sabbagh, Mushtaq Talib Hussein, Ali Fadhil Hashim, Enass Abdul Kareem Dagher Al-Saadi*

203. Vitamin D Level Status and hypertension among Elderly Iraqi People in Al Hillah City..... 1218
*Ismael Hasan Jawad, Hasan ALwan Baiee*

204. Impact of Physical Activity Program upon Elderly Quality of Life at Al-Amara City/Iraq ..... 1223
*Ghazwan Abdul Hussein AlAbedi, Arkan B. Naji*

205. Fear and Anxiety Disorders Related to Childbirth among Primiparous Women in Kirkuk City ..... 1229
*Abbas Lateef Muhe-Aldeen, Ameer Salah-Aldeen Abdulrazaq, Ahmed Mohammed Jasim*

206. Effectiveness of an Educational Program on Nurses' Knowledge and Practices Concerning Nursing Care for Critically – Ill Patients at Critical Care Units in Misan Governorate Hospitals..... 1236
*Aqeel Azeez Arrar, Suad J. Mohammed*

207. Genotyping Tinea Capitis Fungi based on Barcoding ITS rDNA Marker ..... 1243
*Falih Hasan Mohammad Alkhafaji, Hiba Jabur Sallal, Zaidan Khlaif Imran*

208. Encrypt Medical Image using CSalsa20 Stream Algorithm ..... 1248
*Kian Raheem Qasim, Sara Salman Qasim*

209. Evaluation of Students' Self–management and Academic Achievement in the University of Baghdad 1257
*Basima J. Jasim*

210. Risk factors for Cardiovascular Diseases among Diabetic Patients attending Al Nasiriyha Diabetic and Endocrinology Center ..... 1264
*Qasim Ali Khasal, Dheyaa Kadhim Jabbar, Fatima J Shinjar*

211. Comparative Study between the Effect of Melatonin and Hyaluronic acid on Induced Bone Defect Healing in Rabbit ..... 1271
*Rawaa Abdul-Jabbar Mahmood, Noor Abdulkareem Razouki*

212. Knowledge and Protective Health Behaviors Concerning Risk Factors for Coronary Heart Disease among Baghdad University Students ..... 1277
*Aqeel H Jasim, Haider M. Majeed , Tahseen R. Mohammed*

213. Evaluation of Quality of Nursing Documentationin Surgical Wards at Baghdad Teaching Hospitals ... 1284
*Tahseen R. Mohammed, Haider M. Majeed, Aqeel H. Jasim*

214. Knowledge of Mother Regarding Children Vaccines ..... 1289
*Faraj H. Johni*

215. Effect of Corrective Exercises According to the Biomechanical Indicators of the Footprint of the Paraplegic ..... 1294
*Haider Fayyadh ALamiri*

216. Effects of Caring Children with Leukemia on their Mothers` Psychosocial Status ..... 1299
*Adraa H. Shawq, Khitam M. AL-Mousawi , Zaid W. Ajil*

217. Social Factors associated with Relapse in Psychotic Patients Attending Teaching Hospitals in AL-Furat Al-Awsat Governorates ..... 1303
*Ali A. ALHatab, Saja H. Mohammed*

218. Linkage between Cariogenic Streptococcus Mutans and Atherosclerotic Plaques of Cardiovascular Disease Patients in Iraqi Population ..... 1309
*Adil Ateyah A. A. AL-Nasrawi , Haider Ali Muhammed , Ali Kadhim Aljarah*

219. Effect of Omega-3 on Induced Cutaneous Wounds Healing in Rabbits ..... 1316
*Falah Mahmood Hameed*

220. Use of Iraqi Castor (***Ricinus Communis***) Leaf Extract as Anti-Inflammatory in Treatment of Skin Wounds in Rabbits ..... 1321
*Namir I. Mohammed, Jassim M. Khalaf Albozachri*

221. Assessment of Child Complications Related to Fluids and Electrolyte Disorders in Babel Hospital for Mothers and Children in AL-Hilla City ..... 1326
*Abdul Mahdi A. Hassan*

222. The Rate of Post-Spinal Puncture Headache in Patients Undergoing Spinal Anesthesia According to the Size of Spinal Needle (G22 versus G24): Case Reference Study ..... 1329
*Ahmed Matrood Kadhim , Salman Abbas Badi, Watheq Maeh Naji*

223. The Crime of Establishing a Shell Bank – A Comparative Study ..... 1335
*Hawraa Ahmed Shakir , Israa Mohammed Ali Salim , Ammar Ghali Abdulkadhim El-Eisaw*

224. Prevalence Rate of Hepatitis C virus (HCV) and Hepatitis B virus (HBV) Infection in Iraqi Patients on Hemodialysis: Cross Sectional Study ..... 1340
*Wisam Hatef Kareem Al-Muramdy*

225. Impact of Mass Media upon Juvenile Delinquency in Basra Central Prison and AL- Maqal Police Station ..... 1346
*Haider Falih Jabbar, Ali Kareem Al-Juboori*

226. Evaluation of the Quality of Primary Health Care Services for Adolescents With Chronic Illness in Kirkuk City ..... 1352
*Burhan A. Hama Hussein, Mohammed F. Khalifa*

227. Self-evaluation of Continuing Nursing Education Programs in Kirkuk Health Directorate Hospitals ... 1356
*Hussein M. Abdulfatah Salma K. Jeehad*

228. IL-10(-1082 G/A) Gene Polymorphism in Iraqi Patients with Scabies ..... 1361
*Amerah Abdel Hadi, Alaa Jawad Hassan*

229. Assessment of Pregnant Women Knowledge and Practices Concerning Iron Deficiency Anemia at Al-Amara City/Iraq ..... 1368
*Ghazwan Abdulhussein AlAbedi , Aqeel Aziz Arar, Mustafa Salim Abdul Alridh*

230. Epidemiology of Burn Cases in Erbil Governorate ..... 1374
*Pakestan Hamadamin Yousif , Hoshyar Amin Ahmed*

231. Changes of Some Environmental Factors in the Iraqi Coastal Waters ..... 1381
*Mohammed Faris Abbas , Sabeeh H. Al-Mayah , T. A. Khalaf*

232. Primary School Teachers' Attitudes regarding Stuttering of School Age Children at First Al-Karkh Education Directorate in Baghdad City ..... 1390
*Rafea Qadri Meteab Al-Qaisi , Eqbal Ghanim Ali , Ali Kareem Khudhair, PhD*

233. Synthesis and Antibacterial Evaluation of some New Pyrazole Derivatives ..... 1395
*Mohammad M.Al-Tufah, Saad Salim Jasim, Khalid A. Al-Badrany*

234. Bacteriological Study of Eye infection in Baghdad City ..... 1400
*Farah Ali Hameed*

235. Effectiveness of an Instructional Program on Hypertensive Patients' Knowledge toward Prevention of Cerebral Vascular Accident at Al-Razi Center in Al-Basra City ..... 1406
*Khadija Mohammed Jassim, Suad Jassim Mohammed*

236. Determination the Causes of Neonatal Mortality during the Last 3 Years Ago in Al-Kut City ..... 1412
*Gossoon Juma Elywy, Mohammed Malih Radhi, Alaa M. Tuama*

237. Nurses Knowledge Assessment Concerning Prevention of Ventilator-Associated Pneumonia..... 1420
*Hussein Jassim Mohammed , Nuhad Mohammed Kassi , YasharAl-Naamy, Ali F . Abdul Hussein, Raheem Malalla ABADi, R.N Kadhim Husssein Jassim*

238. Maternal Nutritional Status and Preterm Birth ..... 1426
*Hind Abd Al-Rasoul Mughir, Basim Shanin Jasim, R.N .Kadhim Hussein Jassim*

239. Immunological Aspects of Patients Infested with Scabies in Thi-Qar Province, Southern Iraq ..... 1431
*Zainab Abd Ali Mohammad, Nadia Ahmed Hadi, Ahmed Abdulhussein Kawen*

240. Mother's Knowledge of Initiative Breast Feeding in Relation to Neonatal Jaundice ..... 1436
*Nuhad Mohammed Al Doori, Wafaa Ahmed Ameen , Mohommed Talib*

241. Epidemiology and Outcome of Burn Patients in the Burns Specialty Center at Al-Diwaniyah Province, Iraq, 2019..... 1442
*Muhammad Kerim Jasim Albo Jumaa, Abdulameer abdulhussein Kadhim, Hassoon Oleiwi Tinah*

242. The Effect of Fixed Force Exercises by Using Different Tools in the Values of Some Bio Kinematics Variables to the Hit/Spike Skill in Volleyball for Young People..... 1448
*Hussein Ali Kadhim, Ali Naeem Sultan, Amjad Abd Kadhim*

243. Nurses' Knowledge, Attitude and Practice Towards Preparedness of Disaster Management in Emergency of Mosul Teaching Hospitals..... 1454
*Nasir M. Younis, Mahmoud M. Ahmed, Ahmed A. Hussein*

244. Molecular detection of Virulence Factors genes Associated with Immune Resistance in Klebsiella pneumonia ..... 1459
*Nihad Jawad Kadhim , Hayder Shkhair Al-Janabi , Mohanad Jawad Kadhim*

245. Evaluation of Technical Quality and Procedural Errors of Root Canal Treatment Performed by Undergraduate and Postgraduate Dental Students: A Retrospective Radiographic Analysis ..... 1466
*Ahmed H. Ali , Noor H. Fadhil , Ahmed G. Al-Maroof*

246. Studying the Problems of Attracting Attention in the Physical Education Lesson for the Preparatory Stasge from the Female Teachers Point of View..... 1472
*Jihan Karim Amana, Mohssen Ali Musa*

247. Study the Correlation between Serum level of Interlukin 6 and Lactate Dehydrogenase in Myeloma Patients at Stage III with Serum Creatinine and Calcium Level ..... 1477
*Shaymaa Obaid Abdullah, Hussein Jasim Al-Harbi*

248. Direct Vision Comparison of Lip Curvature between Genders in Fully Edentulous Patients..... 1483
*Zahraa S. Karkosh*

249. Evaluation of Nurses' Evidence-based Practice at Primary Health Care Centers in Baghdad City..... 1487
*Ali Hadi Muosa, Mohammed Fadhil Khalifa*

250. The Effect of Competitive Antigen on Some Cytokine in Rabbits ..... 1493
*Aseel Hashim Neama, Ibrahim M. S. Shnawa, Frial G. Abd*

251. Estimation of Vitamin D Levels in Women with Carpal Tunnel Syndrome (with and without Diabetes) ..... 1500
*Ghadeer hamid AL-Ardhi, Adil Mohammed AL-Maamory, Ali Mohammed Abd- Alameer*

252. Hematological Study of Spleenctomized Dog in Iraq ..... 1505
*Ali Hussein Fadhil, Mohammed Assad S. Alkabi, Ihab Ghazi Mahdi AL, Shemmari, Ameer Sachet Atta AL-Saigh*

253. The Effect of Using the Cognitive Strategies on the Achievement and Practical Performance of Physiology (Modeling / Reciprocal teaching) ..... 1511
*Miade Nazim Rashid*

254. Effectiveness of Instructional Program for Nurses' Knowledge regarding Oxygen Administration Methods at Pediatric Teaching Hospitals in Mosul City ..... 1519
*Mohammed Ahmed Sultan Al-Wily , Afifa Radha Aziz, PhD*

255. Nurses Knowledge Assessment Concerning Prevention of Ventilator-Associated Pneumonia..... 1526
*Hussein Jassim Mohammed, Nuhad Mohammed Kassi, YasharAl-Naamy, Ali F. Abdul Hussein, Raheem Malalla ABADi, R.N Kadhim Hussein Jassim*

256. Skill and Capacity of Women through Social Mobilization: Analysis of Urban Women Self Help Groups in Coimbatore City..... 1532
*Kanagaraj S , Priya V*

257. Fluorosis: An Endemic Disease ..... 1538
*Sakshi Chaturvedi, Chakrapani Chaturvedi*

258. Family Interaction Pattern in Wive's of Alcohol Dependents..... 1542
*Chinnu Sebastian , Suja M.K*

259. Experiencing Foster Care-Happiness and Wellbeing of Institutionalised Children ..... 1547
*Saleena.M , Suja M.K*

260. Empathy and Interpersonal Relationship among Institutionalized Children ..... 1552
*Jincy V.V, Suja M.K*

# Carbamate Poisoning – An Autopsy Study

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## Abstract

Acute poisoning is a cause of both morbidity and fatality in many parts of the world. Furadan, the organo-carbamate commonly available in Kerala, being used in plantain, tea, potato and carrot farms as insecticide are usually misused as an easy source of poison for suicide. This study was carried out on Twenty nine medico legal cases, brought with history of carbamate poisoning which were brought for autopsy during the period from January 2014 to June 2015. The main objectives of the study were to study post-mortem findings in Carbamate poisoning, clinical profile in Carbamate poisoning and histopathological changes in Brain, Heart, Lungs, Liver and Kidney due to Carbamate poisoning. Males (82.8%) outnumbered females and maximum cases were of age group 51-60 yrs (27.6%). Most of the victims were taken to hospital for treatment and died after admission (58.6%). Such studies of poisoning cases will help authorities for planning, prevention and treatment of these cases

***Key Words:*** *Agriculture, Death, Furadan, Insecticide, Poisoning*

## Introduction

Agriculture had always been a part of human civilization and involved domestication of plants and animals. From the archaeological evidences it is believed to have developed around 12,000 years ago, although earlier people began altering communities of flora and fauna for their own benefit.[1]Archaeological remnants indicates that rice was a part of the Indian diet as early as 8000 BC.[2]

The Food and Agriculture Organization (FAO) has defined pesticide as any substance or mixture of substances intended for preventing, destroying, or controlling any pest, including vectors of human or animal disease, unwanted species of plants or animals, causing harm during or otherwise interfering with the production, processing, storage, transport, or marketing of food, agricultural commodities, wood and wood products or animal feedstuffs, or substances that may be administered to animals for the control of insects, arachnids, or other pests in or on their bodies. The term includes substances intended for use as a plant growth regulator, defoliant, desiccant, or agent for thinning fruit or preventing the premature fall of fruit. Also used as substances applied to crops either before or after harvest to protect the commodity from deterioration during storage and transport.[3]

The first known pesticide in history would have been sulfur dust used in Sumeria about 4500 years ago. In recorded history, nicotine sulfate extracted from tobacco leaves were used as an insecticide in the seventeenth century. During World War II, DDT (dichloro-diphenyl-trichloroethane) was the most effectively used agent against mosquitos, with high larvicidal and adulticidal properties. However, concern over its residues, magnification and ecological implications were voiced by researchers and practitioners. Above all, possibility of emerging resistance to DDT created concern among them, who advocated development of more desirable and effective substitutes. These include methoxychlor, DDD (Dichloro-diphenyl-dichloroethane), tetra-chloro diphenylethane (TDE) and others, but they also showed

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activity similar to that of DDT.[4]

The production of pesticides started in India in 1952 with the setting up of a plant for the production of BHC (Benzenehexachloride) near Calcutta, and India is a leading manufacturer of pesticides in Asia standing next to China and ranks twelfth globally.[5] There are 234 pesticides registered in India. Out of these, 4 are WHO Class Ia (Extremely Hazardous) pesticides, 15 are WHO Class Ib (Highly Hazardous) pesticides and 76 are WHO Class II (moderately toxic) pesticides, together constituting 40% of the registered pesticides in India.[6]

Agriculture in South India involves 127 million cultivators and 107 million agricultural laborers. Crop productivity in India mostly depends on the monsoons and as such is low and unpredictable. Monsoon-fed areas include more than 70% of the cultivated land in the country. A major chunk of the population (74.3%) is rural and 34.7% live below the international poverty level.[7] During the Green Revolution, to increase the productivity, high-yielding varieties of various crops were introduced. These varieties were significantly more susceptible to plant pests and diseases and, subsequently, the use of pesticides became more popular, increasing from 2,330 kilo ton during 1950–51 to 54,773 kilo ton in 1990–91 (Directorate of Plant Protection, 2002)[8]

The Government of Kerala has banned the sale of Red category pesticides such as Phorate, Thimet and Furadan in the State two years ago, the application of such chemicals is increasing in the state in an alarming rate as they are easily available over the counter at shops in the Kerala-Tamil Nadu border area and there are no government agencies at the border check-posts to monitor their transportation.[9] Because of the easy availability, case of accidental and suicidal poisoning by these pesticides are on the increase and most of them end fatally.

Carbamates are esters of carbamic acid with an anticholinesterase action.[10] They are used as insecticides, fungicides, herbicides, nematicide and acaricide. They are effective by contact, ingestion or inhalation or any other routes through which it can reach the body.[11,12] Their carbamoyl and thiocarbamoyl structure account for their inhibitory action on cholinesterases.[10-12] Carbamates are available as Aldicarb (temic), Carbaryl (agrovin, agoryl, bangvin 50, caravet, hexavin, kevin 50, kilex carbaryl, sevin 50, sujacarb); Carbaryl+gamma BHC(sevidol); carbofuran( agrofuron 3g, furadan 3g, hexafuran, vegfru diafuran); Methomyl (lannate); Propoxur (baygon, protox bait); Triallate (avadex).

## Material and Method

This descriptive study was conducted on all cases with history of Carbamate poisoning brought for autopsy at state medico legal institute during the study period.

The study was conducted for one and a half years duration from 1st January 2014 to 30th June 2015. General information regarding demographic profile, socioeconomic status etc. of each case were collected from relatives. During autopsy the macroscopic appearances of the organs were recorded in the proforma. Bits of tissues from brain, heart, lungs, liver and kidney were collected using sharp knife and were fixed in formalin. The tissues were processed in histokinete and embedded in paraffin wax, cut with a standard microtome and slides were prepared. After that slides were stained with eosin and haematoxylin. Microscopic study of each slide was made at this stage and all microscopic details were recorded in the proforma.

Samples were collected for chemical analysis which include-stomach and upper part of intestine with their contents, about 500g of liver and one half of each kidney. These samples were preserved in saturated saline and send to the chemical examiner's laboratory, Thiruvananthapuram for chemical analysis. Blood and urine, if available was also taken for chemical examination .The report of chemical analysis was collected and analysed for correlation with clinical findings.

The details of the hospital records were analysed with special reference to the clinical findings, laboratory investigation and period of survival. All these findings were compared with the histopathological changes noticed in the cases.

The collected data were statistically analysed in form of ratio & frequencies and compared with other studies.

## Findings

In our study out of total 29 carbamate poisoning cases 82.8% were males and 17.2 % were females. In age group analysis maximum incidence was seen in age group of 51 to 60 years (27.6%), followed by 61-70 years (17.2%).

Present study showed that majority of the cases were farmers (41.4%), followed by manual labourers (27.6%), government servants (10.3%) and housewives (10.3%). One case was a student (3.4%) and two of them were unemployed (6.9%)

Among the 29 cases studied, 31% were graduates, followed by those having plus two qualifications (20.7%) and those studied up to tenth standard (20.7%). Cases who studied up to primary school level and high school level respectively constituted 13.8% each.

Majority of victims consumed furadan along with food (82.8%), whereas the rest consumed furadan mixing it with alcohol (10.3%), with formic acid (3.4%) and with aspirin tablets (3.4%).

Majority of the victims (58.6%) were taken to hospital for treatment and died after admission, while 24.1% of them were brought dead at the emergency department and 17.2% of them were seen dead.

Among the cases studied majority of cases (62.1%) had inter personal problems, while 31% had financial crisis and 6.9% had some unknown reasons for terminating their life.

Death occurred within 12 hours in 62.1% of cases, 41.4% died within one hour of consumption of poison. One victim died on the second day and two of them died on the third day. Eight victims (27.6%) survived more than three days

Among the cases studied 41.4% were not treated, whereas the rest of them (58.6%) were treated as inpatients which included 20.7% cases who needed ventilator support.

The major presenting symptoms were central nervous system symptoms like headache, dizziness, anxiety or convulsion (62.1%) and muscarinic symptoms like salivation (62.1%), followed by sweating (51.7%) and abdominal pain (51.7%).Nicotinic symptom like muscle fasciculation were found in 48.3% of cases. Shock was observed in 24.1% of cases. Froth at nostrils was observed in 31% of cases and lacrimation in 20.7%.

Impairment of plasma choline esterases levels were observed in 11 cases (37.9%). Liver function tests were impaired in 27.6% cases and renal functions were impaired in 20.7% cases.

The results of chemical analysis revealed furadan alone in 79.3% cases. Furadan along with ethyl alcohol were detected in 10.3% cases and furadan along with formic acid were detected in 3.4% cases. In 6.9% cases no poison were detected.

Apart from generalized cyanosis and congestion which were present in all cases, the violet sandy furadan particles were found in stomach in 82.8% cases. Miosis was observed in 58.6% cases and froth at nostrils in 32% cases. Unusual smell of stomach contents were observed in 27.6% cases.

**Table 1: Distribution of post mortem findings**

| **Post-mortem appearances** | **Frequency** | **Percentage** |
|---|---|---|
| Cyanosis | 29 | 100 |
| Congestion | 29 | 100 |
| Furadan particles in stomach | 24 | 82.8 |
| Miosis | 17 | 58.6 |
| Froth at nostrils | 9 | 31 |
| Unusual smell | 8 | 27.6 |

Congestion was the major finding in liver, found in 86.2% cases. Liver was pale in 13.8% cases. 10.3% showed fatty changes, and one case each showed cirrhosis and sub capsular hemorrhage. The major microscopic change observed in liver was congestion in 86.2% cases. Foamy hepatocytes were observed in 48.3% cases. Macro vesicles were seen in 37.9% cases. Thirty one percent cases showed enlarged hepatocytes and 27.6% showed periportal fibrosis. Hepatocyte necrosis and inflammatory infiltrates were observed in 13.8% and 6.9% cases respectively.

**Table 2: Macroscopic findings in liver**

| **Findings** | **Frequency** | **Percentage** |
|---|---|---|
| Congestion | 25 | 86.2 |
| Pallor | 4 | 13.8 |
| Fatty liver | 3 | 10.3 |
| Cirrhosis | 1 | 3.4 |
| Subcapsular haemorrhage | 1 | 3.4 |

Macroscopically in 65.5% kidneys were congested. Cortical hemorrhages were observed in 48.3% of cases and prominence of cortico-medullary demarcation was observed in 37.9% cases. Pallor was observed in 34.5% cases. On histopathology examination, the major change observed was congestion in 65.5% cases. Tubular necrosis was observed in 48.3%, while 34.5% cases showed shrinkage of glomeruli. Red blood cell casts and inflammatory infiltrates were observed in 6.9% cases.

**Table 3: Microscopic findings in kidney**

| **Findings** | **Frequency** | **Percentage** |
|---|---|---|
| Congestion | 19 | 65.5 |
| Tubular necrosis | 14 | 48.3 |
| Shrinkage of glomeruli | 10 | 34.5 |
| RBC cast in tubules | 2 | 6.9 |
| Inflammatory infiltrates | 2 | 6.9 |

Photo 1: Violet sandy furadan particles mixed with stomach contents

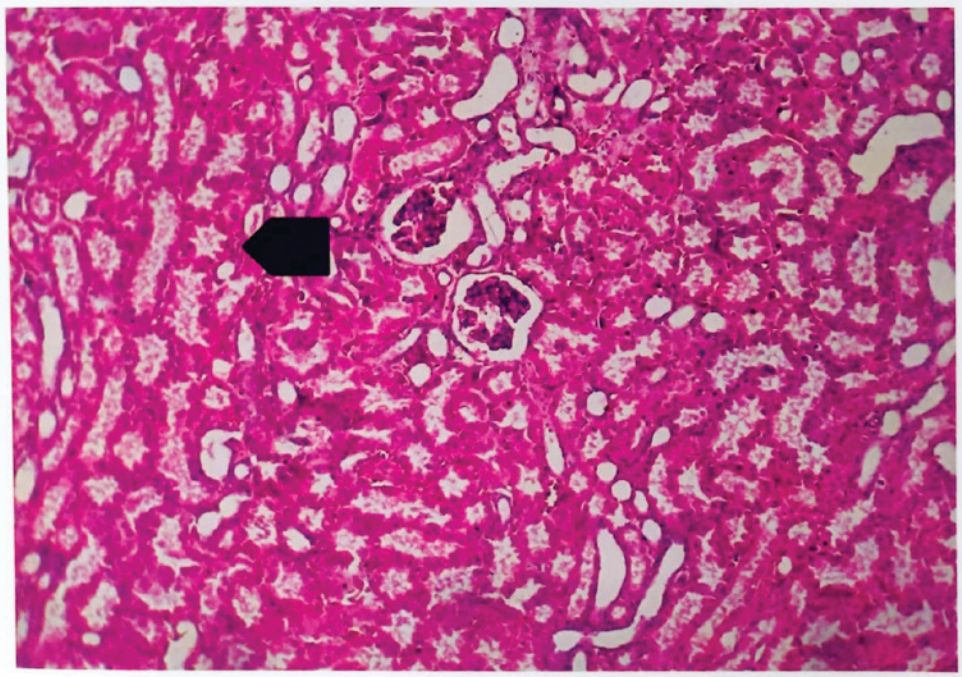

Photo 2: Microscopic picture of Kidney showing tubular epithelial damage and epithelial debris in lumen

On gross examination, heart showed congestion in 65.5% cases. Other findings observed were sub endocardial hemorrhages (34.5%) and flabbiness of myocardium (20.7%).Myocardial fibrosis (10.3% ) , myocardial hemorrhage (7%). and sub epicardial petechial hemorrhages (7%) were also observed. Congestion of cardiac muscle were observed in 65.5% cases on histopathology. Two cases (6.9%) showed myocardial hemorrhage.

**Table 4: Macroscopic findings in heart**

| Findings | Frequency | Percent |
|---|---|---|
| Congestion | 19 | 65.5 |
| Sub endocardial hemorrhage | 10 | 34.5 |
| Flabby myocardium | 6 | 20.7 |
| Myocardial fibrosis | 3 | 10.3 |
| Hemorrhage in myocardium | 2 | 6.9 |
| Sub epicardial petechial hemorrhage | 2 | 6.9 |

Lungs showed congestion in all cases. Oedema was observed in 41%, consolidation in 34.5% and emphysematous changes in 24% of cases. Microscopic examination of lungs revealed congestion in 34.5%, hemorrhage in 44.8% and oedema in 41.4% and shock lung in 24.1% cases.

Gross examination of brain showed congestion and oedema in 93% of cases. Sub arachnoid hemorrhage was observed in one case Histopathological examination of brain showed congestion in 93.1% cases and oedema in 75.6% cases.

Shock lung was not observed in cases that survived for less than 24 hours. It was observed in 7 cases, one among them survived for more than one day but died within two days, two cases survived for more than two days but died within three days and four among them survived for more than five days.

Lung consolidation was observed in 10 cases (34.4%), out of which all cases survived for more than two days. Eight among them survived more than 3 days and four of them survived more than 5 days.

Acute tubular necrosis of kidneys were observed in 14 cases (48.3%). Ten cases among them survived for more than 48 hours. It was not detected in any case that survived for less than an hour.

Sub endocardial haemorrhage was observed in 10 cases (34.4%). Among them 7 cases had gone into circulatory shock during treatment. Three of the cases with sub endocardial haemorrhage succumbed to death before reaching hospital and hence the data could not be assessed.

## Conclusion

Carbamate poisoning is acquiring the status of a special clinical entity because of its increased incidence in south India. Although Furadan is banned in kerala, the preparation is available over the counter in nearby states and is traded illegally across borders. The present study is to find out the relation between clinical, autopsy and histopathological findings in fatal cases of carbamate poisoning.

The results of present study are summerised as follows

1. It was found that 27.6% of the victims belonged to the age group of 51-60 years.
2. The majority of victims were males 82.8% and the rest were females 17.2%
3. Analysis of victims according to their occupation revealed that majority (41.4%) of them was farmers.
4. Among the victims 31% of them were graduates
5. Majority of the victims consumed furadan along with food (82.8%) and 10.3% consumed furadan mixed with alcohol
6. Most of the victims were taken to hospital for treatment and died after admission (58.6%)
7. All cases were suicidal and inter personal problems were the major triggering factor ending up in suicide (62%)
8. Death occurred within 12 hours in 62% cases where 41% died within one hour of consumption of poison

9. Major presenting symptoms were central nervous system symptoms 62.1% and muscarinic symptoms 62.1%
10. Impairment of plasma cholinesterase level was observed in 38% cases. Liver function tests were impaired in 27% cases and renal functions were impaired in 20% cases
11. The results of chemical analysis revealed furadan in 79.3% cases and no poison was detected in 6.9% cases
12. On post mortem examination violet sandy furadan particles were found in stomach in 24 cases (82.8%). Among them 12 cases had undergone stomach wash.
13. Gross examination of liver showed congestion 86.2% cases. Microscopically liver showed congestion (86.2%), foamy hepatocytes (48.3%) and macro vesicles (38%)
14. Macroscopic examination of kidneys showed congestion in 65.5% cases, cortical hemorrhages in 48% and on microscopy congestion was observed in 65.5% followed by tubular necrosis in 48.3%.
15. Heart showed congestion 65.5% cases and sub endocardial hemorrhage in 34.5% cases. Microscopy showed congestion in 65.5% cases
16. Pulmonary congestion was observed in all cases and oedema was observed in 41% cases
17. Gross examination of brain showed congestion and oedema in 93% cases. Microscopy revealed oedema in 75.6% cases

**Conflict of Interest**: None to declare

**Source of Funding**: Self

**Ethical Clearance:** Institutional Ethics Committee clearance obtained

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Original Research Paper

# Profile of Burn Deaths: A Study based on Postmortem Examination of Burn Cases at R.N.T. Medical College, Udaipur

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## Abstract

Burn injuries are a public health problem in developing countries like India specially in females. Our objective of the present study is to know the pattern of deaths due to burns, socio etiological factors involved and to suggest preventive measures. A study based on autopsies conducted in R.N.T. Medical College, Udaipur (from 1st March 2018 to 30th September 2018) where total 780 Medico-legal autopsies were conducted during this period , out of those 86 were due to burn. 45 victims were male and 41 were female. Maximum 46 of the cases were in the 21-40 years of the age group in both genders. Most of the cases were found to be from rural area (80.23%). The most common manner of burn was accidental (74.41%) followed by suicidal burns (22.09%). Majority of victims died as a result of flame burn (74.41%) and death due to flame, major cases were females (62.5%). Majority of victims (41.86%) died with more than 80% burns and (52.32%) victims could not survive for more than 24 hours. The cause of death in (52.32%) cases was shock followed by septicemia in (32.5%).

***Keywords:*** *Burn, Incidence, Pattern of burn, Manner of death.*

## Introduction

Burns constitute a major role in mortality and morbidity in the whole world, whether accidental, suicidal or homicidal. Burn injuries are among the most devastating of all injuries and a major global public health crisis. Burns are the fourth most common type of trauma worldwide, following traffic accidents, fall from height and homicidal death. Approximately ninety percent of burns occur in developing countries, regions that generally lack the necessary infrastructure of fire safety measures and instruments to reduce the incidence and severity of burn cases in human being.

Dowry deaths in India have become a problem of great concern. Almost every day we see in the media and read in the newspapers. Cases of young women either burnt or provoked to commit suicide by the husband and in-laws for the dowry. At the same time accidental burns are very common in young women. They are more vulnerable as most of the young women spend their time in the household work especially in the kitchen.[7]

The aim of present study is to provide an analysis of burn morality across all age group, dead bodies brought in the mortuary of RNTMC, Udaipur. It investigates how to mortality is distributed across all age groups, sex, and population groups and what are the circumstances of burn mortality occurrence.[4]

## Material and Method

This is prospective study based on autopsies conducted in the Department of Forensic Medicine Toxicology, Ravindra Nath Tagore Medical College, Udaipur during 1st March 2018 to 30th September 2018. In this period total 780 autopsied were conducted, out of that 86 dead bodies were brought to mortuary with the alleged history of burn injuries. These cases autopsies

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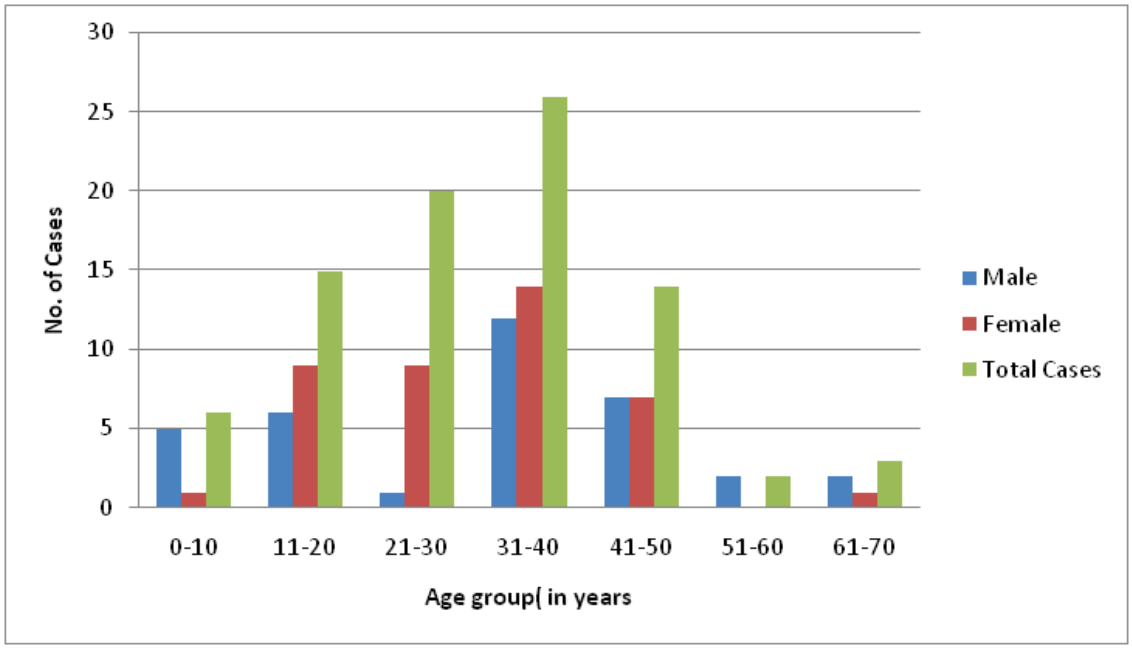
reports prepared in detail including age, gender, time of death, period of survival, percentage of burn injuries, hospital records, history recorded from the police with inquest papers, relatives of deceased and friends.

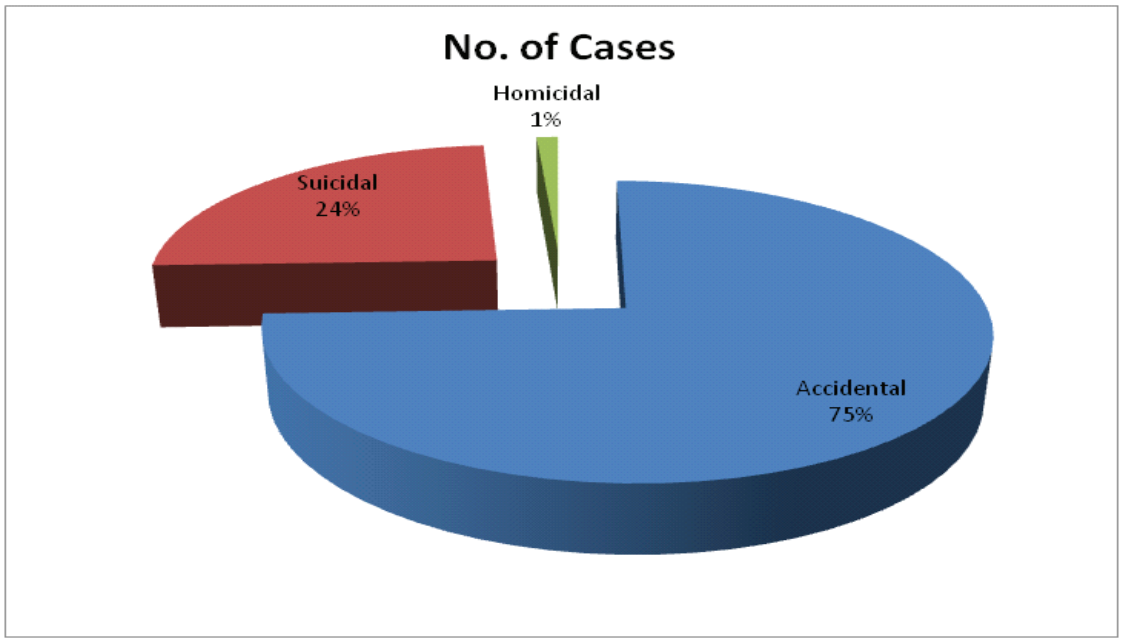
**Distribution of burn cases according to age and gender (Fig.1)**



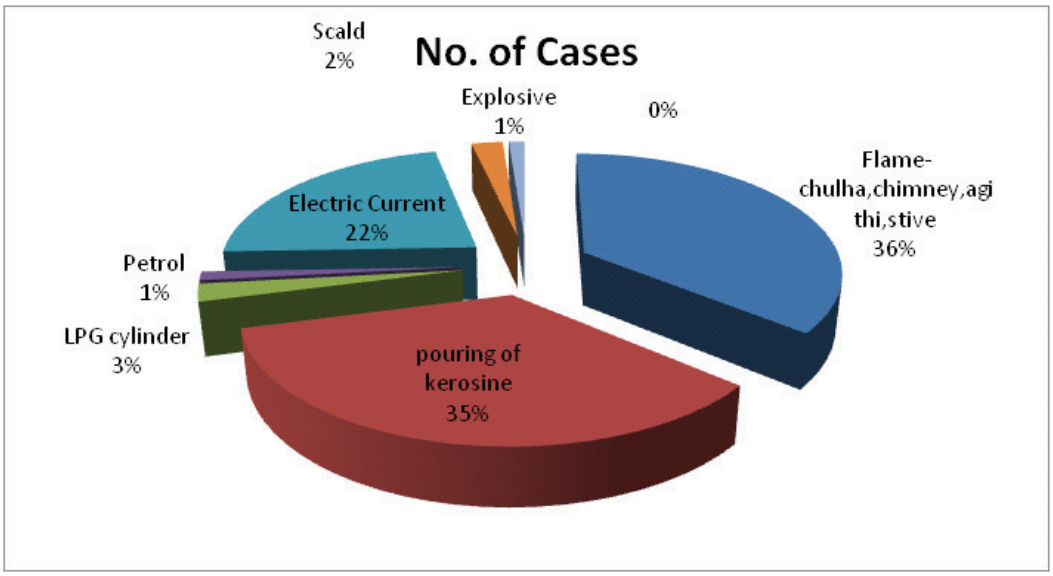

**Distribution of burn cases according to marital status (Table 1)**

| Marital status | No. of cases | Percentage |
|---|---|---|
| Married | 65 | 75.5 |
| Unmarried | 21 | 24.5 |

**Distribution of burn cases according to manner of death (Fig.2)**




**Distribution of burn cases according to type of burn (Fig.3)**




**Distribution of burn cases according to involved body surface area (Table 2)**

| TBSA% | No. of cases | Percentage |
|---|---|---|
| 0-20 | 20 | 23.3 |
| 21-40 | 04 | 4.6 |
| 41-60 | 07 | 8.1 |
| 61-80 | 19 | 22.1 |
| 81-100 | 36 | 41.9 |

**Distribution of burn cases according to duration of survival (Table 3)**

| Duration of survival | No. of cases | Percentage |
|---|---|---|
| <12hrs | 25 | 29.06 |
| 12-24hrs | 20 | 23.25 |
| 2-3days | 14 | 16.27 |
| 4-7days | 17 | 19.76 |
| >1 week | 10 | 11.62 |

## Result

In the study period total 780 medico-legal autopsies were conducted, out of total, 86 cases brought to mortuary with the alleged cause of death as burn. 45 were males and 41 were females. Male and female ratio was 1:1.1. 46 cases were in the 21-40 years of age group in both the gender. Maximum cases belong to the married category (75.5%). Majority of the cases were from rural area (80.23%). Majority of burn incidence occurred at home (80.23%). Peak incidence of electric burns occurred in rainy season. Manner wise distribution of death due to burns reveals that more number of victims died by accidental burn (74.41%) followed by suicidal burn (24.4%) and homicidal burn

(1.16%). Majority of victims died as a result of flame burn (74.41%) followed by electric burn (22.09%), scald burn (2.32%) and explosive burn (1.16%). Death due to flame burn majority of cases were female (62.5%). This study revealed that the total body surface area involved was more than 80% category in 41.86% cases. Majority of death due to burns in victims were more due to shock (66.2%) followed by septicemia (32.5%) and complications (1.16%). Majority of victims died due to burn admitted in hospital were (83.7%). Majority of burn incidence occurred during 9 p.m. to 4 a.m. (45.3%) followed by 1 p.m. to 8 p.m. (31.4%) and 5 a.m. to 12 p.m. (23.3%).

Most of the burn deaths occurred at indoor places and were preventable by reasonable precautions. Most effective ways to prevent these burn accidents are mass public education programme regarding safety measures in household environment and industries, first aid education of burn injuries should be part of elementary education. All buildings and industries should be equipped with all fire safety instruments.

## Discussion

In the present study, there is slight predominance of male victims on females and majority of them were in the reproductive age group 21-40 years. Most common manner of the burn was accidental, followed by suicidal and homicidal. similar in an earlier study of government medical college and hospital Chandigarh and PDU Medical college Rajkot, it was observed that most burn death occurred in the age group of 21-40 years.[7] In other study of deaths from burn in Faisalabad, most common age group in females was 20-29 years and in males 30-39 years.[8]

In our study maximum cases belongs from married category and majority of burn incidence occurred at home. Similar study reports of Ranchi 78.6% burn cases were married[10] and in Chandigarh study majority of burn cases were married and belong from rural area.[11]

Manner wise distribution of deaths due to burn was accidental followed by suicidal and homicidal. In other study of Rajkot most common manner of death was accidental followed by suicidal and homicidal and in Memochoubi et al study most of death due to burn were accidental.[2,7] In study of Masud U et al .most of burn cases died due to homicidal burn (59%).[8]

Majority of victims in my study died due to flame burn (74.41%) followed by electric current (22.09%), scald burn (2.32%) and explosive (1.16%). Females died due to exposure of flame burn cases were (62.5%). In similar study of death from burn in Faisalabad most of cases were of flame burn, in Indore study most common agent of burn injuries were flames.[8,12]

41.86% cases involved more than 80% body surface area in my study which is similar to Memchoubi et al study.[2]

Most common cause of death is shock in 66.2% cases in present study which is similar to other study of Mishra et al from 01 January 2013 to 31 December 2013[9] and the fire is both a blessing and scourge to the mankind study of Mangal HM et al 55.33% victims died within 24 hours of incidence due to shock.[7] Majority of burn incidence occurred in late night (9 p.m. to 4 a.m.).[7,9]

## Conclusion

In the present study, there is male predominance slight higher than female, with the majority of burn cases are between 21-40 years of age. Flame and accidental burns were the most common mode of burn injuries involved. Most of burn injuries occurred at homes and were preventable by reasonable efforts and fire safety measures. Our study clearly indicated that shock was the most common cause of death. Main factor of high rate of burn injuries in society are social factors. Most important step in reducing the burn incidence is through mass education programme, simple safety instructions and adopting measures regarding fire safety. Government, non-government organizations and doctor community are needed to concentrate in the fire safety programme. Burn prevention programmes need to be launched in country especially in rural areas. In cold climate, fire safety measures should be followed in special manner to prevent burn injury accidents.

**Ethical Clearance t**aken from institutional ethical committee of RNT Medical College, Udaipur as per rules.

**Source of Funding :** Self

**Conflict of Interest:** Nil

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# Psychological Autopsy: *the Psychological Assessment of the Dead Individual's Role in the Death*

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## Abstract

This article deals with the psychological assessment of equivocal death. As an investigator it is important to possess the knowledge of the cause and manner of the circumstances surrounding any suspicious death. The authors of this study have explored in detail the procedures involved in the equivocal death investigations and protocols followed during the conduct of the interview by the investigators. However, the psychological autopsy report has certain guidelines to be prepared and needs to be evaluated in-depth before any conclusions is to be drawn. To be politically correct, this paper will leave no stone unturned in terms of psychological assessment of the deceased role in the death.

***Key words:*** *Psychological autopsy, Equivocal death, and Investigations.*

## Introduction

"*Human consciousness is an unusual template of experience and emotions" – Unknown*

In every instance of death, a physician must distinguish both the cause and mode of death. The cause of death is defined as "the original underlying medical condition which initiates the lethal chain of events culminating in death"[20], Its is the duty of the medical examiner, coroner, and law enforcing authorities, to determine the mode of death in all violent and suspicious death investigations. There are times when physical evidence and evidence found in autopsy does not reveal the mode of death. This is known as equivocal death. Equivocal deaths often involve questions that surface around suicide, homicide, accidental or some natural deaths. Those deaths that fall under the category of "undetermined" are based on what is found at the scene of crime and autopsy, but which frequently require a closer "psychological" investigation and examination. The psychological autopsy was developed as a further post mortem investigative tool that aids in the determination of the person's death. The psychological autopsy is a retrospective construction of a decedent's life initiated to get a better understanding of his death. It is used to determine the victim's psychological intent, using interviews and examination of documents to reconstruct the behaviour, personality, lifestyle, habits and history of the victim prior to death[15]. The concept and technique of the psychological autopsy was developed by Dr. Edwin S. Shneidman who defined the psychological autopsy as:

"*A behavioural scientific impartial investigation of the psychological (motivational, intentional) aspects of a particular death. It legitimately conducts interviews (with a variety of people who knew the decedent) and examines personal documents (suicidal notes, diaries, and letters) and other materials (including autopsy and police reports) that are relevant to the role in the individual's death*"[19]**.**

In general terms, it is used to determine the state of mind, and to identify the personality of the deceased at the time of death in order to clarify the mode of death[7].

### Indications for psychological autopsy

Applications of the psychological autopsies are most commonly used when a case is controversial whether suicidal or accidental. What appears, as suicide could be murder, what seems to be murder could be culpable homicide, what resembles a culpable homicide could in fact be an accident? What is apparently an accident can

turn out to be a case of suicide[4]. For instance, a pedestrian walking out in front of a moving vehicle – to determine whether it was an accident or intentional? Drug ingested deaths also raises questions, whether the drug was taken accidentally (overdose), or purpose of self–destructive behaviour, or was administered by someone else. Firearm related deaths require looking into the history of the individual, was the person obsessed with weapons, or careless in handling weapons, defect of the firearm itself and queries continue till the conclusions are derived.

Typical equivocal deaths may be when a child who commits suicide aged between five to nine, then the next task is to determine whether the child is psychologically capable of committing suicide, or in single vehicle accidents when the car leaves no skid marks, or hangings where there is the possibility of the death having resulted from an autoerotic asphyxia, or sexual asphyxia (sexual fantasies derived from hypoxic states) gives us erroneous conclusions whether suicidal or accidental[11]. For example, suicide by drowning there is likely to be an orderly scene, hats, or handbags left behind, with clothing folded, or if it is a woman wearing a night dress sometimes to keep stones in the pockets for two reasons, firstly to drown faster and secondly, the dress does not float exposing her body in an obscene manner. A drowning due to homicide involves the presence of unexplained injuries and disturbances in a scene of crime, to determine the person was dead or alive when he reached the water is investigated by weeds or plants present in the hand, held firmly due to cadaveric spasm, and study of diatoms present in the body[16], in case of accidental drowning victim's pocket article may contain a trip planner, which suggests the victim did not predict his death. In falls from height cases, the cause of death is due to the multiple injuries sustained by the impact of hitting the ground, but the mode of death may not be certain. The occurrence could have been an accident, may be the victim tripped, or it may have been intentional or the victim has been pushed out. Especially, if the physical evidence has no significance and absence of witnesses. Therefore, further investigation is needed to determine the mode of death in equivocal cases.

The term Psychological autopsy is related to two types of investigations:[10]

1) Understanding the psychosocial factors that have contributed to the death.

2) To assist in the forensic determination of the manner of death.

For these criterions to be fulfilled some objectives are necessary:[3]

a) Medical history and history of events surrounding the death.

b) Details of scene of crime.

c) The quality of autopsy.

**Behind the scene of equivocal death investigation**

Role of the medical examiner in the investigation:

The medical examiner, who is the forensic pathologist defines the cause of death, provides details about the manner and circumstances of death and the results of a medico-legal autopsy. It is the job, or privilege of the forensic pathologist who acts as a medical detective, to probe, investigate and record the truth. The prime function of the medical examiner is medico-legal certification of the manners of death, when it is straightforward in "typical" cases, while complex in "equivocal" cases[12]. The medical examiner's responsibility for certifying the manner of death has important legal, social, medical and research implications[12].

**Role of the investigators:**

An investigator in the death team investigation includes the magistrate/coroner, medical examiner, psychologist, psychiatrist, a psychiatric social worker, or a police investigating officer and other law enforcement authorities. As psychological autopsy aids as an investigative tool which is at the outer edge of professional knowledge and practice in that it requires an application of skills, experience, and training to assess a variety of factors including the behaviour, thoughts, feelings, and relationships of an individual who is deceased[12]. Therefore, the interview with the family, friends, co-worker, relatives, neighbours, physicians and other acquaintances to prepare a psychological autopsy report are carried out mainly by the mental health professionals and behavioural science investigators, the possible reason for this, is the limited training and exposure of medico legal officials in the psychological aspects of equivocal death. For reasons that the coroner or magistrate has minimized background in medicine or psychology, moreover the medical examiner also receives most of the training in pathology and forensic science techniques with little formal training in

psychological aspects of death[12].

Primary goals of these mental health professionals and behavioural scientists are:[18]

a) To determine the mode of death.

b) Reasons for death at that particular period of time.

c) Assessment of lethality (suicide).

d) Psychotherapeutic value to the survivors.

**Protocol to conduct an equivocal death interview**

a) Ethical considerations concerning the interview, is of prior importance, the integrity of the deceased must be respected. There may be issues that the deceased or his or her family does not want revealed or facts that requires special handling. It is the responsibility of the interviewer to maintain the code of ethics in relation to the deceased.

b) History of the actual events must be reviewed, later the interviews of family members, friends, relatives, colleagues at work/school, neighbours, physicians, priest, acquaintance and eyewitnesses, should be conducted.

c) Approaching the informant to conduct an interview is an important consideration, the informants are contacted by mail and later a phone call, to avoid contact refusal rate[1]. The time interval between the death and the interview will influence the quality of information, for instance, day or weeks etc. degrade memory traces.

d) It is important to avoid harming the survivors. Sometimes they may not be ready for an interview, so the interviewer has to be flexible and ready to re-schedule the interview. If someone refuses to participate, that decision should also be respected and no feelings of guilt should be placed on them.

e) The interviewer should establish mutual respect and confidence, with the informant, and ensure confidentiality and anonymity, and also obtain an informed consent before the investigation[2].

f) The interviewer must have experience in dealing with situations of varying degrees and possess knowledge of the state of mental health of the interviewee, who may be in immense emotional crisis (shock/grief)[13].

g) The skills of interviewing includes, proper language, clear, listening more than speaking, no threatening questions, no repetitions, avoid loaded questioning and more than one informant in a single interview[18].

h) The interviewee may have motives of giving exaggerated information or concealing facts, or give pertinent information to protect the image of the victim and family. False information also can be given due to lack of memory or it may be intentional. Therefore is important to explain to the interviewee the significance of the information they are providing. It is the role of the interviewer to be able to assess distorted or irrelevant information[13].

i) The interviewee's reactions should be evaluated and the interviewer should possess skills and knowledge of the bereavement process and support for the family and friends during investigation[14].

j) The interviewee's opinion and reactions to the interview can be obtained by asking them to complete a brief questionnaire at the end of the session.

**Salient features in an equivocal death interview**[7]

1) Description of the deceased: the personal views about the deceased.

2) Period of association with the deceased: how long they know the deceased, how often they see each other, type of relationship between them.

3) Any changes noticed in behaviour or emotional distress associated with the deceased.

4) Any problems noticed by the interviewee, or have discussed with them.

5) Observed or expressed mental status of the deceased to situation of depression and stress.

6) Recent changes physically observed: pain, signs of illness, fatigue, tension, or loss of appetite, changes in sleep pattern, insomnia, wakes up throughout the night.

7) The interviewee's reasons behind the death: what would have probably happened and why.

Other sources:[5]

- Suicide note: This plays an important role to solve the whole issue if it is proved that the deceased had written the suicide note (verified by a forensic

document examiner), the contents and language (specific references to suicide or morbid content). Suicide note also plays as an experimental control for the mental health professionals in interviewing process, when they are not disclosed about the evidence, and to derive their opinion to provide an estimate of validity[17].

o Personal documents: Letters (family, friend, relatives, or acquaintances), dairies, videos, and literature read recently and in past (morbid content), emails, threats notes or messages received recently, bills, tickets, and pornographic collections if any.

o Medical records: Visits to physicians, medical illness, addiction, family history of illness, whether under medications.

o School records: Information such as change in academic performance or absenteeism, conduct and character in general

o Military records: Reveals education and training background, areas of deployment, promotions, efficiency and obsession for weapons.

o Employment records: Performance, conduct, alibi of work and absenteeism.

With the above mentioned information, a psychological autopsy report is produced, and later reviewed by the death investigation team to determine the mode of death[6]. The psychological autopsy is considered ultimately to be an expert opinion; therefore it depends on the accuracy of the data collected from the interviews, examination of relevant documents and other materials. Therefore the interviewee's probabilities and limitation to science should be noted[15].

**Guidelines To Prepare The Psychological Autopsy Report**

These are general guidelines that should or might be useful in preparing a psychological autopsy report and should be used only when there is an absolute indication[5,6,8,10].

1) Identifying information for victim

2) Details of the death

3) Crime scene evidence

4) Medical autopsy report

5) Background/outline of victim's history

5a. Development history

5b. Medical history

5c. Psychiatric history

5d. History of previous suicidal attempts

5e. Substance abuse history

5f. Financial history

5g. Employment history

5h. Educational history

5i. Marital history

5j. Sexual history

5k. Legal history

5l. Family history

5m. Military history

6) Death history of victim's family

7) Description of the personality and life style of the victim

8) Description of last days of life

9) Assessment of intention

10) Reaction of the informants to victim's death

11) Rating of lethality of suicidal intension

I. Lethality: absent/low/medium/high

II. Rating: 0-8

III. Statement: First degree - high rating 6-8

Circumstance is certain for suicidal death.

Second degree – medium-rating 4-6

Impulsive Vs unplanned act.

Third degree – low-medium rating 0-3

Remote possibility of suicidal death.

**Evaluation of psychological autopsy report**

The psychological autopsy report provides detailed information about the death using various sources including the autopsy report, medical records, relevant

documents and information gathered from interviews with key informants. These sources and information provided is to be clearly documented for evaluation and its potential validity. The behavioural scientist and other mental health professionals would be expected to provide more systematic details about the important psychological stages in the person's thought processes e.g. motivation and personality, to deliver a formal evidence for the conclusion. Actually there is no well developed conceptual or theoretical basis for deriving conclusions from various sources of information, due to lack of standardised technique or specific procedure in conducting the psychological autopsy which may serve as areas of potential weakness. From the assumption that people known to the deceased can furnish details of both the historical and recent activities and behaviour of the deceased, the information may be distorted or biased, the informant can deny, conceal or suppress valuable information necessary for the evaluation.

Therefore, circumstances surrounding death are given important consideration; including pre-existence of a stressor in some form of debilitating life circumstances is usually a precursor to suicide. Increasing rate of suicide by firearms can be due to the increasing availability of the lethal agent[6], there are cases of poisoning seen more often in farmers, or drug toxicity in personnel who work in medical and other health services. The crucial concept for defining suicide is intention. A major purpose of the psychological autopsy is to clarify the pre-mortem intensions of the deceased[15]. Previous suicidal attempts or depression provides a prima facie evidence for suicide as opposed to accidental death. In this context, rating of lethality plays an important role. The crime scene investigation has an active participation in the evaluation regarding the circumstances surrounding death for an accidental case a precise reconstruction of events is absolutely necessary, in case of homicide, the investigator should keep in mind that any individual, when accused of a crime, will tell a tale favourable to themselves. Murder will be painted to look like self-defence, for instance, and manslaughter to resemble an accident. Some suspects can be further be subjected to polygraph, of which validity is of concern in court of law.

The investigators should not base their opinions on police reports and other forms of documentary evidence, as they are incomplete, or because the police are primarily interested in determining whether a homicide has been committed and also psychological autopsies evaluation should not rely on depositions alone[9]. Here, the investigator is merely interpreting a prior set of facts rather than predicting future behaviour based upon the limited facts available before assessment. The final judgement as to the mode of death is based upon a review of all the know facts and circumstances; including the magistrate/coroner's report, forensic medical report, police reports, crime scene analyst reports, and the psychological reconstruction[19]. Finally, to analyse and conclude to a specific answer in equivocal death circumstances, are dependent on the objectives to remove the bias from the conclusions that may be encountered in suspicious death or ambiguous fatalities, and to facilitate the expansion of knowledge so that people may learn from the tragedy and, hopefully, be cautious and reduce the chances of similar occurrence in future.

## Conclusion

Psychological autopsy is most often used in cases of suspected suicide or homicide in an attempt to reconstruct the personal life and character of the deceased, to uncover hidden secrets that may help to give family members peace of mind and also plays a role in many legal suits, malpractice suits, and insurance claims, including criminal investigations. This article has covered in-depth inquiry of psychological assessment involved in analysing the procedures of psychological autopsy that has become a valuable tool in the investigation and, at times, resolution of questionable and equivocal death cases. Despite the weakness of the evidence and procedures used in this technique, mental health professionals face problems while reconstructing a psychological autopsy in both in civil and in criminal matters, when questions can be raised to the mental state of the deceased prior to death. Therefore, it is important to establish the value that the report may add to the proceedings, and that includes the admissibility of psychological autopsies as evidence in court hearing which will also be expected to vary from case to case, in terms of understanding the application of rules of evidence and concerning the scientific basis for the technique.

**Conflict of Interest:** None declared.

**Source of Funding:** No funding.

**Acknowledgement:** Nil

**Ethical Approval**: No ethical approval is needed.

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# Legality In Hospitals- Medico-Legal Case Management

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## Abstract

The growing number of legal issues in various fields and specialties in the current era has been no different in the healthcare sector. The complexity associated with such issues has been the major concern of practicing doctors/healthcare professionals. In this article, an attempt has been made to focus the legalities in the field of medicine with an emphasis on the Indian set up and existing Laws governing such actions. The article comprises of medico-legal case management, awareness and prevalent practices among the health care professionals especially among those who are directly or indirectly involved with the treatment of patients. As far the awareness is concerned regarding a procedure, the documentation and various other medico-legal issues were studied in detail. Also, various aspects of medico-legal cases admitted in the hospital.

***Keywords:-****Medico-legal, Medicine, Law, MLC case management*

## Introduction

The health profession is taken into account to be one amongst the noblest professions within the world. The application of medication is capable of rendering noble service to humanity provided ordinary care, sincerity, efficiency, and professional skill is observed by the doctors. However, today, the patient-doctor relationship has nearly diminished its fiduciary character and has become additional formal and structured. The law, like medicine, is an inexact science. One cannot predict with certainty an outcome of cases many a time. It depends on the actual facts and circumstances of the case, and also the personal notions of the judge concerned who is hearing the case. The axiom "you learn from your mistakes" is too little honored in healthcare. The best way to handle medico-legal issues is by preventing them[1]. The survey deals with various aspects of medico-legal cases admitted in the hospital. The medical professionals need scientific knowledge, technical skill, moral understanding of profession and awareness about the relevant laws of the land. Primarily doctors but also on other ancillary and administrative staff of the hospital have several ethical and legal obligations in the performance of their duties.

## Methodology

The material for the present study is comprised of information gathered from the medical professionals- Physicians, medical administrators, members of hospital ethical committee, who were directly or indirectly engaged in treatment and care of various kind of medico-legal case management. This study was carried out at five hospitals. The method used was interview with the concerned staff . The questions were designed to know the standard of knowledge and skill, practical application, customary practices, in their hospital as it may or may not be within the control of the doctors and ancillary staff. Appropriateness in documentation in case-files, record keeping, care of preserving material of evidence of medico-legal cases for purpose of the law as per guidelines of regulatory authorities. Also, lawyers and judicial officers were consulted to gain information for the same.

## Discussion

Not only medical professionals but also various private medical institutions are usually apprehensive in dealing with MLC, for, according to them, an MLC (Medico-legal Case) implies a lot of disputes, unwanted burden, rough speaking police officials, inordinate hours in the court, unrelenting defense counsels, etc. Because of this fear-factor, they either try to avoid the cases or try to get rid of them as soon as possible. With these improper understanding of the implication of the cases,

they invite mistakes, deliberation, which may land them in trouble. Members of the medical profession are liable to be called upon to give medico-legal assistance in varied circumstances and situations by police and law. Like any other witness, the medical practitioner is also bound to answer truly all questions posed to him in the court of law. The law usually requires reliable evidence of facts and authoritative opinions. Thus, a doctor has not only to play a vital role struggling to save the life of the patients or relieving their sufferings but also has to fulfill the required minimum formalities on medico-legal aspects in each case.

**Medico-Legal Case**

A medico-legal case is a case of injury/ illness/death of the subject where the attending doctor, after eliciting history and examining the patient, thinks that some investigation by enforcement agencies is important to ascertain and fix responsibility for the case in accordance with the law of the land. It may be described as a case of injury or ailment, etc., in which investigations by the law enforcing agencies are essential to fix the responsibility regarding the causation of the said injury or ailment. The doctor is ought to do everything possible to resuscitate the patient and make sure that he's out of danger. All legal formalities stand suspended till the patient is out of danger. This has been clearly exemplified by the Honorable Supreme Court of India in Parmananda Katara Vs Union of India.Every doctor is bound to provide medical aid to the victims irrespective of the cause of the injury; he cannot take any excuse of allowing the law to take its course.

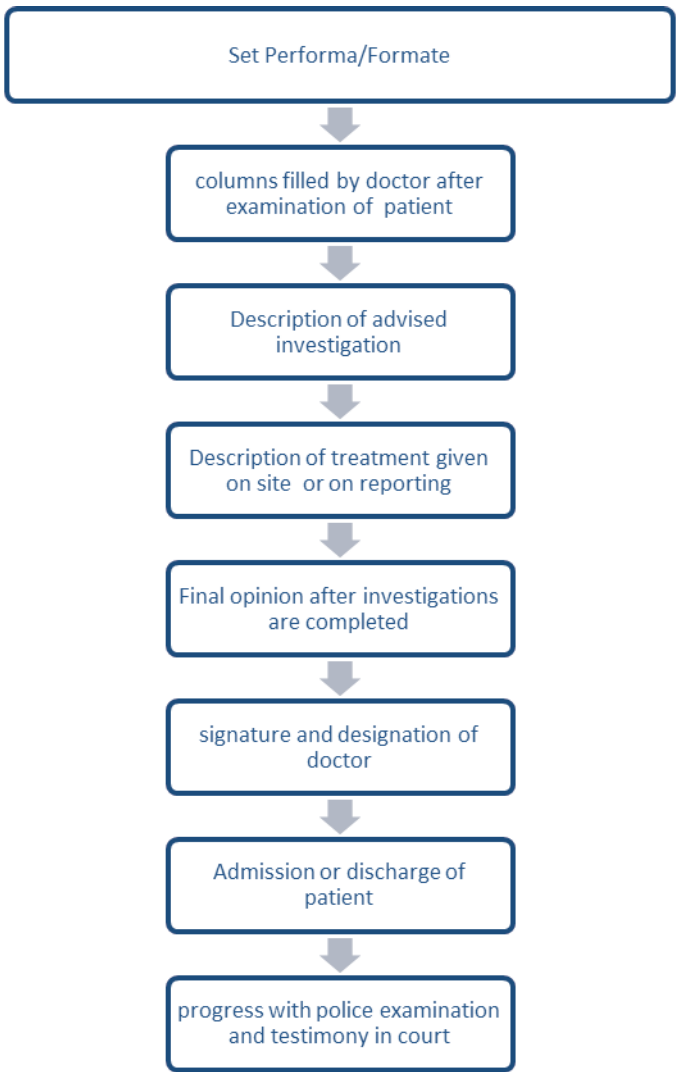


**Fig.1.1 Medico-legal Case process**

**Receiving MLC**

A Doctor will receive a Medico-Legal Case in any of the four situations:

• A case is brought by the police for examination and reporting or order of the Court for medico-legal examination.

• The person in question was already attended by a doctor and MLC was already registered in a previous hospital and the person is now referred for expert management/advice.

• When the patient himself expresses his intention to register a case against the alleged accused.

• By the doctor himself after eliciting history and examining the patient, if he feels so that the case in accordance with the law of the land. In such state of affairs, the doctor has to utilize his medical knowledge and judgment to decide whether the case should be treated as MLC or not, especially when the history is not fully concealed, either by the patient or his relatives/ friends, due to some motive.

**Brought Dead Cases**

In all the brought dead cases wherever casualty duty officer is extremely satisfied after taking history and researching the records present, that the death was natural, he may not label them as medico-legal strictly at his discretion. In the death certificate form against the column of the cause of death one should write "NOT KNOWN BROUGHT DEAD" In no case, it should be mentioned that cause of death should be determined after post mortem.[2] A Doctor making MLC is a mere legal formality even in brought dead cases. It is practically impossible to diagnose the cause of death on external examination, history, etc. It is for the police being law enforcing personnel to decide whether it is natural or unnatural death or to submit for Post mortem examination to rule out.

**Documentation of an MLC**

Documentation is completed in duplicate in a set Performa (as per Hospital policy) with a ball-point pen, in clear and legible handwriting and incomplete words without using abbreviations. Cutting/ overwriting etc. should be avoided as much as possible and all corrections should be properly initialed. Abbreviations of any sort should be avoided. Separate Performa may be available for medical examination, an examination of drunkenness, etc. All columns are filled up fastidiously and by the identical Doctor who had examined the patient. Each MLC is given a recent MLC number consecutive. The details are completed there itself, leaving no provisions as to be completed later on. Investigations advised and found to be entered Treatment given at the site or on reporting. The opinion to be recorded in the MLC sheet, if an opinion cannot be given, under observation be given and signed by the doctor with name written in block letters. The Final opinion is given by the same doctor making MLC in the original MLC sheet. After all, investigations are completed. After completion, the Doctor must sign and mention his/ her full name below it with designation and Police constable on duty should be informed in each case. After registration of a case as MLC henceforth all documents and registration forms bear identical MLC number as well as the discharge slip. The patient is admitted or discharged with recommendation be entered into the case sheet. The doctor examining the patient should complete the MLC sheet before leaving the hospital.[3] All MLC X-rays be kept in the department as evidence for a court of law. Special samples were taken to be entered into the MLC sheet. If the patient is dead or died when handed over to the police for post mortem and not to relatives, A copy of the MLC sheet is handed over to the police for further investigation against his signature and belt number on the copy.

**Collection and preservation of samples**

When a Medico-legal case is received by a Hospital, preservation, and collection is the prime concern of the hospital. The following samples are collected-Gastric lavage, Vomitus in poisoning cases, Blood in Alcoholic/ poisoning cases/drug abuse/ or for DNA test (preserve in Refrigerator/ or in common salt),Clothes in Assault/ Injury/Firearm/Burn cases, Nail clippings in Assault/ Rape cases Pellets/Bullet etc. if recovered, Vaginal swabs/ smears /Pubic hairs in Rape cases, Swabs from firearm entry wounds, Urine for pregnancy test in Rape cases, Undergarments, Swabs from Glans penis in Rape/ Unnatural sexual offences[4].Any other exhibit e.g., a bottle of poison, tablet or weapon if recovered should be properly labeled and sealed. Sample seal to be given and the endorsement of a sample of the seal should also be made in MLR.

**Dying Declaration**

A dying declaration or statement created by the

person on the verge of death on the cause of his death or on to any of the circumstances of the transaction that resulted in his death, such a statement, oral or in writing, made by the deceased to the witness is a relevant fact and is admissible in evidence, provided it has been created by the deceased while in a fit mental condition as certified by the attending doctor. A Doctor should intimate the police for calling the Magistrate to record the declaration. If there's no time the attending doctor ought to record the dying declaration in presence of police[5].

**Examination of MLC Cases**

It is advisable that a lady doctor should examine a woman, or, wherever this is not possible, a female attendant/nurse should be present during the examination. If a case is referred from another hospital where medico-legal case sheet has been prepared, the findings are attached to the same without making fresh MLC. If the date of incidence is delayed and the patient brought late, the present findings are to be entered in MLC.

**Admission and Discharge**

Whenever a medico-legal case is admitted or discharged, the same should be informed to the nearest police station at the earliest. It is better to tell the police through the casualty of the hospital wherever the medico-legal register is typically maintained and necessary entries may be made in it. While discharging or referring the patient, care should be taken to see that he/she receives the Discharge Card/Referral Letter, complete with the summary of admission, the treatment given in the hospital and also the directions to the patient to be followed when discharged[6]. Failure to try and do therefore renders the doctor accountable for "negligence" and "a deficiency of service". If the patient is not serious and can take care of him, he may be discharged on his own request, after taking in writing from him that he has been explained the doable outcome of such a discharge which he is happening on his own against medical advice. Police have to be informed before the said patient leaves the hospital.

**Abscond/Death of Medico-Legal Case**

In case an individual admitted as a medico-legal case expires or absconds, inform the police immediately. Send the body to the hospital mortuary for preservation, till the legal formalities are completed and the police release the body to the lawful heirs. Request a medico-legal Postmortem examination, providing a copy of the death summary. Do not issue a death certificate before post-mortem even if the patient was admitted[7]. The dead body should NEVER be released to the relatives; it ought to solely be handed over to the police.

**Copy of MLC to Individuals Other Than Police**

A medico-legal report could be a report given by a professional and is of confidential nature and isn't a public document. As such the accused or respondent is not entitled to get a copy of the same during the investigation of the case. In such cases, a no-objection certificate should be obtained from the police authorities investigating the cases, before a copy is supplied. In some cases, the police ask for a medico-legal report after the case has been discharged or expired. It is irregular to issue a medico-legal report on the MLC in such cases. The police, however, can ask for any specific information (including the details of injury), which may be supplied to them from a record of such case. If needed a fresh MLC to be made recording the present findings, after re-examining the patient on a new date.

**Medical Testimony of Doctor In The Court Of Law**

Do not misrepresent documents/medical literature in the Court of Law. When evidence is read into the record of a trial, only that portion of the document, which validates the information being discussed need to be read aloud. One paragraph or even one part of a paragraph may be all that is necessary to substantiate the point you are making. When a document is cut in a manner, which lends the quoted passage a meaning other than what would be derived from a more complete reading, you are misrepresenting the document[8].

**Final Opinion**

Final opinion is to incline on the original MLC sheet by the identical doctor preparing record reckoning on investigation findings or treating physician in admitted case. Final opinion in MLC to be given by the hospital where it had been made after obtaining a case summary from a referred hospital. After discharge of the patient or death the MLC record to be sent to MRD for preservation. The doctor needs to give a witness in court as an expert witness if summoned by the Honorable Court. At that point he could manufacture the case record or final opinion ahead of the magistrate.

## Conclusion

Medico-legal cases have to be forbidden properly, following the latest prevailing guidelines. Even if due guidelines/procedures are not followed or not available, these cases pose no problem if one uses proper caution and due care and attention, while dealing with them. Proper documentation, Timely data, an organized and thorough examination together with all relevant investigations and referrals, etc. are all that is necessary to see such cases completed successfully.

**Conflict of Interest**- Nil

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# To Assess Association of Bullous Pemphigoid and Neurological Disorders- A Clinical Study

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## Abstract

**Background:** Bullous pemphigoid is an immunobullous disease which affects the elderly. The present study was conducted to assess association of Bullous pemphigoid and neurological disorders.

**Materials & Method:** The present study was conducted on 125 cases of pemphigoid. Parameters such as name, age, gender, clinical features, etc were noted. The medical history, neurological diseases and medications used by the patients were recorded.

**Results:** Out of 125 cases, 65 were in males and 60 were in females. Common neurological disorders were dementia seen in 15, stroke in 12, Hemorrhagic stroke in 6, Parkinson's disease in 14 and epilepsy in 5. The difference was significant ($P< 0.05$). There was positive correlation of dementia, stroke and Parkinson's disease with Bullous pemphigoid ($P< 0.05$).

**Conclusion:** Authors found that positive correlation of dementia, stroke and Parkinson's disease with Bullous pemphigoid.

***Key words:*** *Bullous pemphigoid, Dementia, Parkinson's disease.*

## Introduction

Bullous pemphigoid is an immunobullous disease which affects the elderly. The incidence of BP has been estimated to be 4.5 to 14 new cases per million per year. The prevalence is shown to be increasing in some studies.[1]

Bullous pemphigoid (BP) is an autoimmune subepidermal blistering skin disorder which occurs mostly in the elderly.[2] It is associated with circulating autoantibodies against hemidesmosomal proteins BP180 (BPAG2) and BP230 (BPAG1) in the dermoepidermal junction. Clinical features of this disease include subepidermal blisters on urticarial plaques, erythematous, or noninflamed skin. It occurs mostly on the flexural aspects of the limbs and on the trunk. BPAG2 is a transmembrane protein that has a long extracellular domain and is associated with synapse stabilization in the central nervous system. BPAG1 is an intracellular protein which belongs to the plakin family.[3]

The role of BPAG1 is to connect the intermediate filament, microtubule, and microfilament cytoskeletal networks with each other and to cell membrane sites. They are also known as scaffolds for signaling proteins that modulate cytoskeletal dynamics. Different isoforms of BPAG1 have been found: BPAGI-e in the skin, BPAG1-a in the nervous system, and BPAG1-b in the striated muscle.[4]

There is growing evidence to suggest an association between BP and a range of neurological disorders including dementia, cerebral stroke, Parkinson's disease, cerebrovascular disease, multiple sclerosis, epilepsy, and polyneuropathies. While the immunological mechanisms have not been fully elucidated the association between BP and neurological disorders may be due to immune responses arising from cross-reactivities of skin auto antibodies with BP antigens or their isoforms that are known to be expressed in brain and neuronal tissue.[5] The present study was conducted to assess association of Bullous pemphigoid and neurological disorders.

## Materials & Method

The present study was conducted in the department of Oral Medicine & Radiology. It comprised of 125 cases of pemphigoid. Ethical clearance was obtained from institutional ethical committee. All patients were informed regarding the study and written consent was obtained.

Parameters such as name, age, gender, clinical features, etc were noted. The medical history, neurological diseases and medications used by the patients were recorded. Data thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

## Results

**Table I Distribution of cases**

| Total- 125 | | |
|---|---|---|
| **Gender** | **Males** | **Females** |
| Number | 65 | 60 |

Table I shows that out of 125 cases, 65 were in males and 60 were in females.

**Table II Neurological disorders**

| Neurological disorders | Number | P value |
|---|---|---|
| Dementia | 15 | 0.05 |
| Stroke | 12 | |
| Hemorrhagic stroke | 6 | |
| Parkinson's disease | 14 | |
| Epilepsy | 5 | |

Table II shows that common neurological disorders were dementia seen in 15, stroke in 12, Hemorrhagic stroke in 6, Parkinson's disease in 14 and epilepsy in 5. The difference was significant (P< 0.05).

**Table III Correlation of Neurological disorders and Bullous pemphigoid**

| Neurological disorders | R value | P value |
|---|---|---|
| Dementia | 0.321 | 0.04 |
| Stroke | 0.314 | 0.01 |
| Hemorrhagic stroke | 0.982 | 0.12 |
| Parkinson's disease | 0.412 | 0.05 |
| Epilepsy | 0.824 | 0.54 |

Table III shows that there was positive correlation of dementia, stroke and Parkinson's disease with Bullous pemphigoid (P< 0.05).

## Discussion

Several mechanisms have been postulated to explain the association between bullous pemphigoid and neurological disorders. Firstly, in terms of immunology and inflammation, neuronal isoforms of BP180 and 230 antigens lead to cross reactivity between the skin and the brain.[6] This process is further facilitated by damage to the blood-brain barrier due to the neurological disorder. Systemic inflammation involving the T helper 1 and T helper 2 immune responses has also been found in bullous pemphigoid as evidenced by elevated serum levels of cytokines.[7]

Clinical manifestations include pruritus and urticated, erythematous lesions which later develop into large, tense subepidermal blisters and mucosal involvement. An association of bullous pemphigoid with neurological diseases such as stroke, dementia, Parkinson's disease, epilepsy, amyotrophic lateral sclerosis, syringomyelia and multiple sclerosis has been reported.[8] The present study was conducted to assess association of Bullous pemphigoid and neurological disorders.

In this study out of 125 cases, 65 were in males and 60 were in females. Chen et al[9] conducted a retrospective case-control study involving 43 patients with bullous pemphigoid and 43 age-, sex- and ethnicity-matched controls. There was a statistically significant association between bullous pemphigoid and neurological disorders

in particular for dementia. Although stroke was more common among patients with bullous pemphigoid, this association was not statistically significant with OR of 1.9 and adjusted OR of 2.1. Similarly both ischaemic stroke and hemorrhagic stroke were more common. Other neurological disorders more common among patients with bullous pemphigoid were Parkinson's disease and epilepsy. Dyslipidaemia was significantly less common among patients with bullous pemphigoid.

We found that common neurological disorders were dementia seen in 15, stroke in 12, Hemorrhagic stroke in 6, Parkinson's disease in 14 and epilepsy in 5. Yang et al[10] in their cross-sectional study, 87 patients with BP were enrolled. Out of 87 patients with BP, 17 (19.5%) had at least one neurological disease. Cerebrovascular accident (CVA) was the most common neurological disease that was seen in 7 patients (8.0%) in the case group and 4 (2.1%) in the control group. The incidence of CVA was significantly different between BP patients and the control group ($P$ = 0.022). Dementia was observed in 6 patients in the case group (16.8%) and 2 (1.0%) in the control group. The incidence of dementia was significantly different between BP patients and the control group ($P$ = 0.008). In this study, the incidences of Parkinson's disease ($P$ = 0.830), epilepsy ($P$ = 0.067), and multiple sclerosis ($P$ = 0.326) were not statistically significant between the two groups.

We found a positive correlation of dementia, stroke and Parkinson's disease with Bullous pemphigoid ($P< 0.05$). Langan et al[11] retrospectively assessed 183 patients with BP and 348 age- and sex-matched controls for neurological disorders. Overall, there was a highly statistically significant association between BP and neurological disorders. These included dementia, Parkinson`s disease, stroke and other neurological disorders but not Alzheimer`s diseases, which was more common among patients in the control group.

Texeira et al[12] observed that neurological disorders which cause central nervous system inflammation or degeneration were related to BP and the association was strongest between multiple sclerosis and BP (13). Indeed, an association between multiple sclerosis and BP has also been observed in several other reports. Interestingly, other conditions such as dementia, Parkinson's disease, epilepsy, stroke, schizophrenia, schizotypal and delusional disorders, as well as personality disorders also revealed a statistically significant association with BP.

## Conclusion

Authors found that positive correlation of dementia, stroke and Parkinson's disease with Bullous pemphigoid.

**Ethical Clearance**- Taken from Institutional Ethical committee

**Source of Funding**- Self

**Conflict of Interest**- Nil

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# To Assess Clinical Profile of Patients with Dermatophytosis Infection

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## Abstract

**Background:** The distribution of dermatophyte infections and their causative agents varies with geographical region. The present study was conducted to assess clinical profile of patients with dermatophytosis infection.

**Materials & Method:** The present study was conducted on 86 patients of both genders. In all patients, a through clinical examination was performed. The skin specimen was taken for histopathological examination.

**Results:** Out of 86 patients, males were 34 and females were 52. Type was T. corporis in 24, T. cruris in 14, T. manuum in 2, T. unguium in 13, T. Faceii in 12, T. capitis in 11 and T. pedis in 10. The difference was significant (P< 0.05).

**Conclusion:** Dermatophytosis is common in skin disorder seen all age groups especially adults. Most common was T. corporis followed by T. cruris and T. manuum.

***Key words:*** *Dermatophytosis, Skin, Geographical.*

## Introduction

Dermatophytoses is a superficial infection caused by a group of fungi, dermatophytes. The distribution of dermatophyte infections and their causative agents varies with geographical region and is influenced by a wide range of factors, such as type of population, climatic factors, lifestyle, migration of people, cultural practices and socioeconomic conditions, incidence of peculiar comorbidities and drug therapy.[1]

Dermatophytes comprise of three major genera, Trichophyton, Microsporum and Epidermophyton, of the class hyphomycetes and division deuteromycota. They are keratinophilic in nature and have the ability to colonize keratinized non-living tissues such as skin, hair and nail in human and animals. The infection spreads easily by direct contact from infected humans and animals or through fomites.[2]

The infection is common world-wide with higher prevalence in tropical countries. The dermatophytoses infection is commonly referred as ringworm due to the appearance of the lesion. Despite the increasing incidence of recurrent dermatophytosis, information on the extent of the burden in our country is scarce.[3]

Dermatophytosis is currently a disease of worldwide importance and a public health problem in many parts of the world particularly in developing countries.[4] Although the disease hardly causes death, it is a common refractory infection deleteriously affecting the quality of life via social stigma and upsetting day-to-day activities.[5] Large population size, low socioeconomic status, inadequate health facilities, and exchanging of foot-wears, clothes, and barber shop materials among people in developing nation have been recognized as potential risk factors for the proliferation of the disease.[6] The present study was conducted to assess clinical profile of patients with dermatophytosis infection.

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## Materials & Method

The present study was conducted in the Department of Dermatology, Krishna Institute of Medical Sciences Deemed to be University, Karad.

It comprised of 86 patients of both genders. The study was approved from institutional ethical committee. All participants were informed regarding the study and written consent was obtained.

Data related to participants such as name, age, gender etc. was recorded. In all patients, a through clinical examination was performed. The skin specimen was taken for histopathological examination. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

## Results

**Table I Distribution of participants**

| Total- 86 | | |
|---|---|---|
| **Gender** | **Males** | **Females** |
| Number | 34 | 52 |

Table I shows that out of 86 patients, males were 34 and females were 52.

**Table II Type of dermatophytosis**

| **Type** | **Number** | **P value** |
|---|---|---|
| Tinea corporis | 24 | 0.01 |
| Tinea cruris | 14 | |
| Tinea manuum | 2 | |
| Tinea unguium | 13 | |
| Tinea faceii | 12 | |
| Tinea capitis | 11 | |
| Tinea pedis | 10 | |

Table II shows that type was T. corporis in 24, T. cruris in 14, T. manuum in 2, T. unguium in 13, T. Faceii in 12, T. capitis in 11 and T. pedis in 10. The difference was significant (P< 0.05).

## Discussion

The epidemiology of dermatophytoses in developed countries has also exhibited notable changes over the past decades as a consequence of variation in some environmental conditions, and the distribution of the etiological agents usually reflects the changing clinical patterns of dermatophytoses.[7] Some species of dermatophytes are endemic in certain parts of the world and have a limited geographic distribution. T. soudanense, T. gourvilii and T. yaoundii are restricted to Central and West Africa. T. concentricum is confined to islands in the South pacific.[8] The present study was conducted to assess clinical profile of patients with dermatophytosis infection.

In this study, clinical profile of patients with dermatophytosis infection was assessed.

We found that out of 86 patients, males were 34 and females were 52. Type was T. corporis in 24, T, cruris in 14, T. manuum in 2, T. unguium in 13, T. Faceii in 12,

T. capitis in 11 and T. pedis in 10.

Mahajan et al[9] conducted a study in which one hundred and fifty patients with recurrent dermatophytosis were enrolled. Recurrent dermatophytosis was seen in 9.3% of all patients with dermatophytosis in this study. Trichophyton mentagrophytes was the most common species identified (36 patients, 40%) samples followed by T. rubrum (29 patients, 32.2%). In−vitro antifungal susceptibility testing showed that the range of minimum inhibitory concentrations (MIC) on was lowest for itraconazole (0.015–1), followed by terbinafine (0.015–16), fluconazole (0.03–32) and griseofulvin (0.5–128) in increasing order.

Lakshmanan et al[10] conducted a study in which Tinea capitis was the predominant clinical manifestation consisting of 48.1% of the cases. Among 153 patients with tinea capitis, 73.2% were in the age group of 1-14 years. Of 318 study participants, 213 (67.98%) were found to be positive for dermatophytosis microbiologically. Out of 164 fungal isolates, 86 were dermatophytes and 78 were non-dermatophyte fungi. Among 86 dermatophytes, T. violaceum represented 38.4% of dermatophyte isolates and 89.7% of the isolates were recovered from tinea capitis. Of 76 non-dermatophyte molds, Aspergillus spp., Scytalidium dimidiatum, and Cladosporium spp. were the most common isolates, respectively.

Senthamilselvi et al[11] found that out of total 150 subjects, most common clinical type of dermatophytosis, identified in our study, was tinea corporis in 53 (35.3%) subjects followed by tinea cruris in 34 (22.6%) subjects. 134 (89.3%) subjects were tested positive by direct microscopy (KOH mount) and 69 (46.0%) by culture. Highest KOH mount positivity was seen in patient suffering from tinea corporis (94.3%) followed by tinea cruris (94.1%).

Pathania et al[12] found that the most frequent clinical forms were tinea unguium (39.2% of the total dermatophytoses), tinea corporis (22.7%) and tinea pedis (20.4%). There was a predominance of women for tinea unguium and corporis and of men for tinea pedis and especially tinea cruris. T. rubrum was the prevalent causative agent, implicated in 64% of total cases, followed by M. canis (14%) and T. mentagrophytes (10%). In parallel with this changing pattern, the frequency of isolation of T. rubrum has shown a continuous increase during the last 35 years, whereas a progressive decline of the etiological role of T. violaceum, M. canis and even more of E. floccosum has been noted.

## Conclusion

Dermatophytosis is common in skin disorder seen all age groups especially adults. Most common was T. corporis followed by T. cruris and T. manuum.

**Ethical Clearance**- Taken from Institutional Ethical committee

**Source of Funding**- Self

**Conflict of Interest** - nil

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*Original Research Article*

# The Study of Trends and Out Come of Acute Poisoning in a Tertiary Care Hospital Khammam, Telangana; India

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## Abstract

**Background and Objective:** It is important to know the trends, nature, sevesrity and outcome of acute poisoning cases in order to take up appropriate planning, time lapse, first aid and recovery. This study is to assess the trends and outcome of acute poisoning cases in a tertiary care hospital in Khammam.

**Materials and Methods:** This is a retrospective study conducted in a tertiary care hospital attached to a medical institution in Khammam. The study includes 126 cases and data regarding age, sex, time elapsed after intake, circumstances of poisoning, name of the poisonous substance, chemical type, duration of hospitalization, severity and outcome collected in the Proforma.

**Results:** Incidence was common among 21-30 yr. old married Hindu male laborers from rural background belonging low socioeconomic classes with only primary education. Majority of the incidents occurred in the victim's home during the day time. Maximum number of cases were encountered during the Rainy season and in the month of November. Organophosphorus insecticides and poisoning by snake bite were the commonest types of poisoning. Majority of the acute poisoning cases were hospitalized within one hour of toxic exposure. Maximum number of patients stayed in hospital for up to 7 days and recovered. Family problems and financial problems were the most common reasons behind poisoning. Overall mortality was found to be 3.05% and 38 cases succumbed to the poisoning.

**Conclusion:** Poisoning was common in young males. Maximum number of cases encountered in Rainy season. Organophosphorus insecticides and poisoning by snake bite were the commonest types of poisoning. Majority of the acute poisoning cases were hospitalized within one hour of toxic exposure. The overall mortality was substantially high, mainly contributed by self-poisoning with insecticides. Early care in a tertiary care center may help to reduce mortality in India.

***Key words:*** *Acute poisoning, Trends and outcome, tertiary care hospital, Time lapse, OPC*

## Introduction

Poisoning both accidental and intentional were significant contributors to mortality and morbidity throughout the world According to WHO, three million acute poisoning cases with 2,20,000 deaths occur annually. Of these 90% are of fatal poisoning and occur mainly in developing countries particularly among the agricultural workers[1]. Acute poisoning forms one of the commonest causes of emergency hospital admissions. Pattern of poisoning in a region depends on variety of factors, such as availability of the poisons, socioeconomic status of the population, religious and cultural influences and availability of drugs. In India, it has been estimated that about 5 to 6 persons per lakh of population die due to poisoning every year.[1] The most common cause of poisoning in India and other developing countries is pesticides. OP compounds are readily available, relatively cheap and have a rapid, lethal action even in smaller doses. Therefore, they are

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widely used as suicidal poisons.[2]

The mortality and morbidity in any case of acute poisoning depends upon a number of factors such as the nature of the poison, dose consumed, availability of medical facilities, treatment by qualified persons and time interval between intake of poison and provision of medical help.

The main objective of the present study was assessing the pattern and outcome of acute poisoning cases admitted at a tertiary care hospital and to know the nature and severity of poisoning in order to take appropriate preventive measures.

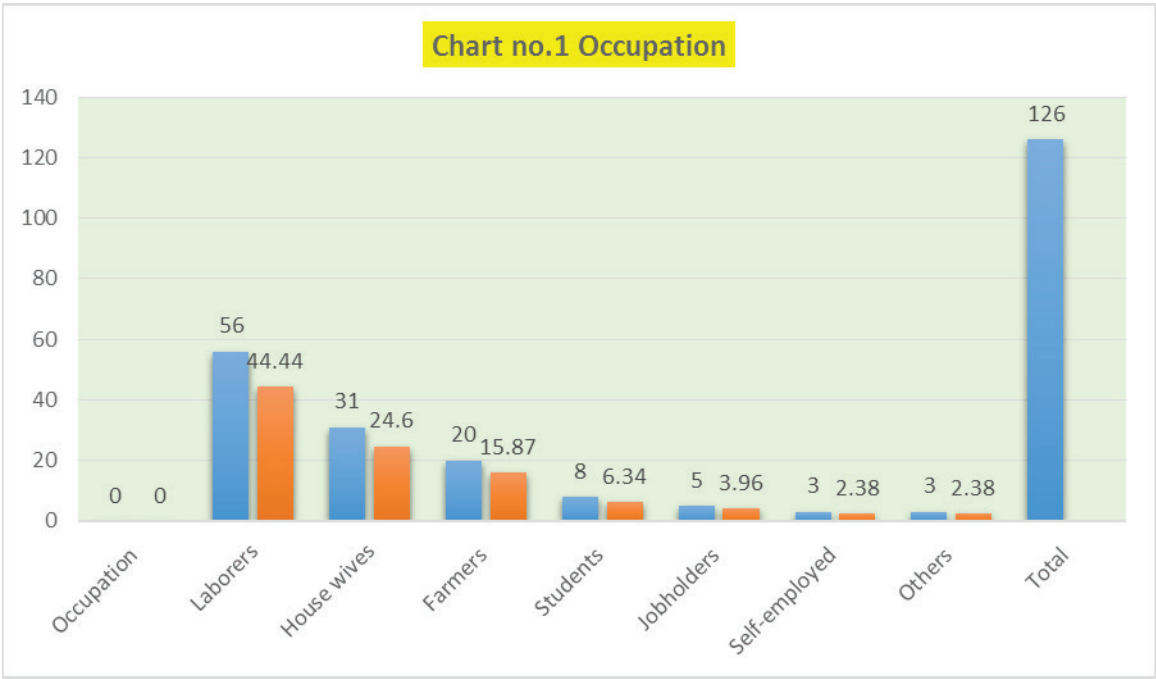
## Materials and Method

Present retrospective study was conducted in a tertiary care hospital attached to a Medical College in Khammam for a period of one year from October 2017 to August 2018. The study included 126 cases of various acute poisoning due to various poisons /drugs /chemicals. Data regarding profile, domicile pattern, type of poison, manner of poisoning, seasonal trends, motive behind poisoning, name of poisonous substance, chemical type, duration of hospitalization, severity, time elapsed after intake and outcome were collected in the Proforma. All data were documented, analyzed and interpreted with previous studies. In our study the age above 14 years onwards cases were studied.

## Aims and Objectives

To assess the trends and outcome of acute poisoning cases in a tertiary care hospital in Khammam.

To know the nature, severity and outcome of acute poisoning cases in order to take up appropriate preventive measure.



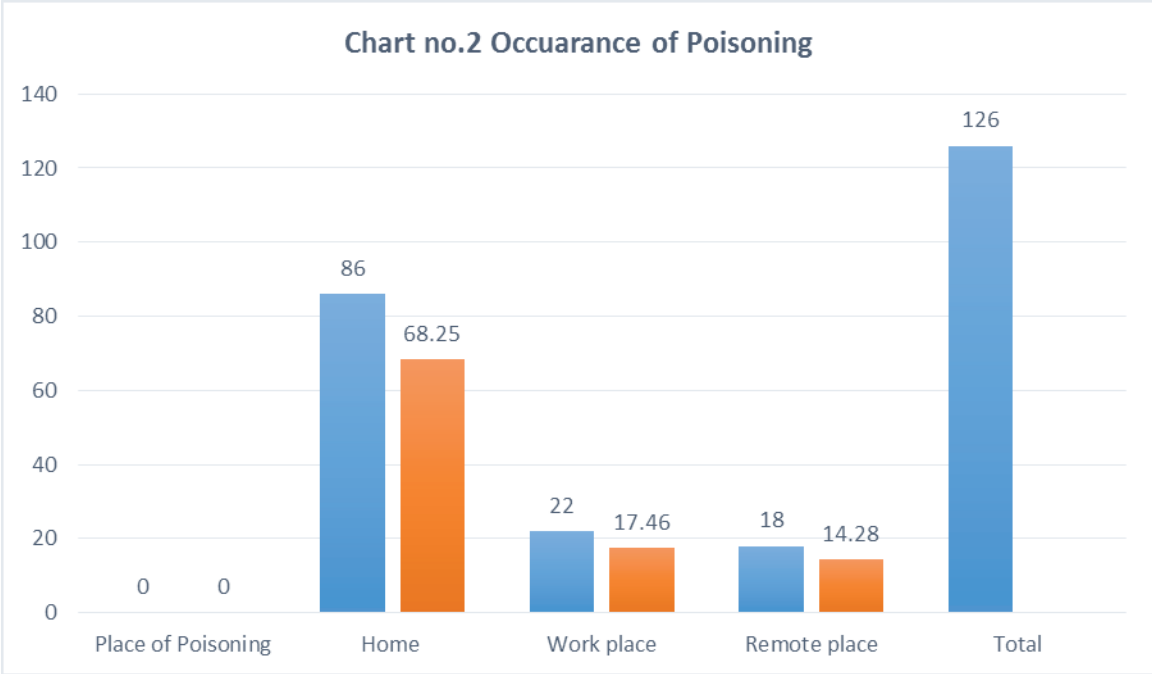


Chart no.2 Occuarance of Poisoning
140
120
100
80
60
40
20
0
0
0
86
68.25
22
17.46
18
14.28
126
Place of Poisoning
Home
Work place
Remote place
Total

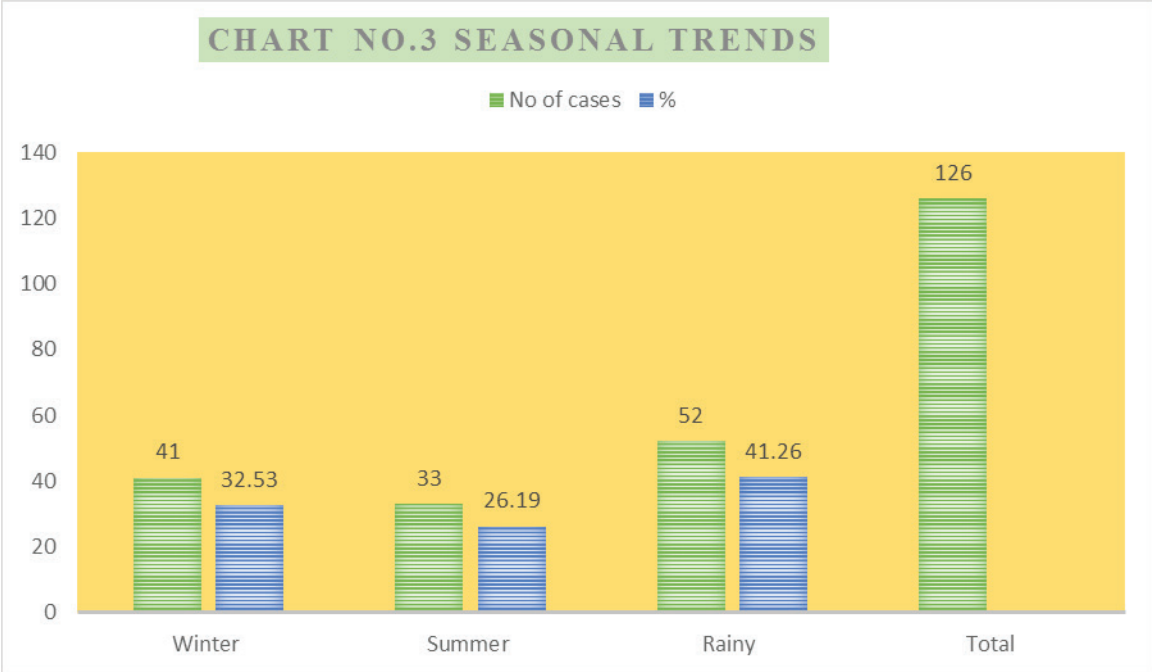


CHART NO.3 SEASONAL TRENDS
No of cases
%
140
120
100
80
60
40
20
0
41
32.53
33
26.19
52
41.26
126
Winter
Summer
Rainy
Total

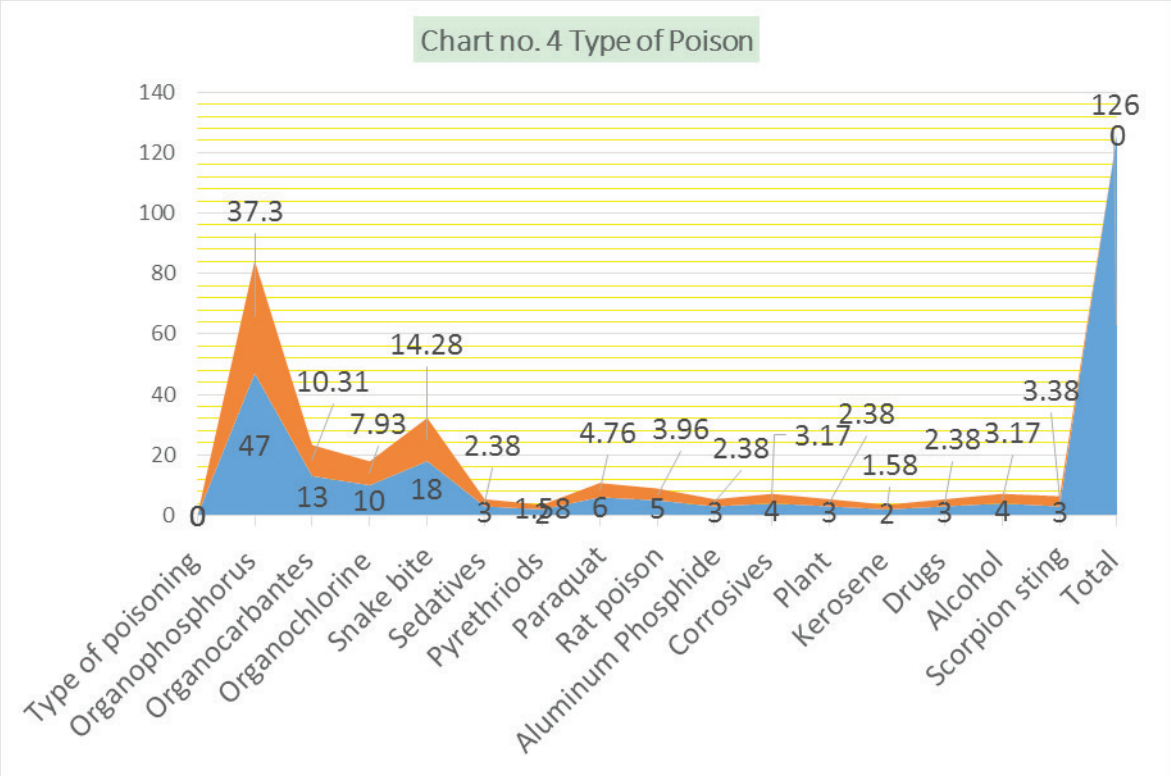


Chart no. 4 Type of Poison
140
120
100
80
60
40
20
0
37.3
47
10.31
13
7.93
10
14.28
18
2.38
3
1.58
2
4.76
6
3.96
5
2.38
3
3.17
4
2.38
3
1.58
2
2.38
3
3.17
4
3.38
3
126
0
0
Type of poisoning
Organophosphorus
Organocarbantes
Organochlorine
Snake bite
Sedatives
Pyrethriods
Paraquat
Rat poison
Aluminum Phosphide
Corrosives
Plant
Kerosene
Drugs
Alcohol
Scorpion sting
Total

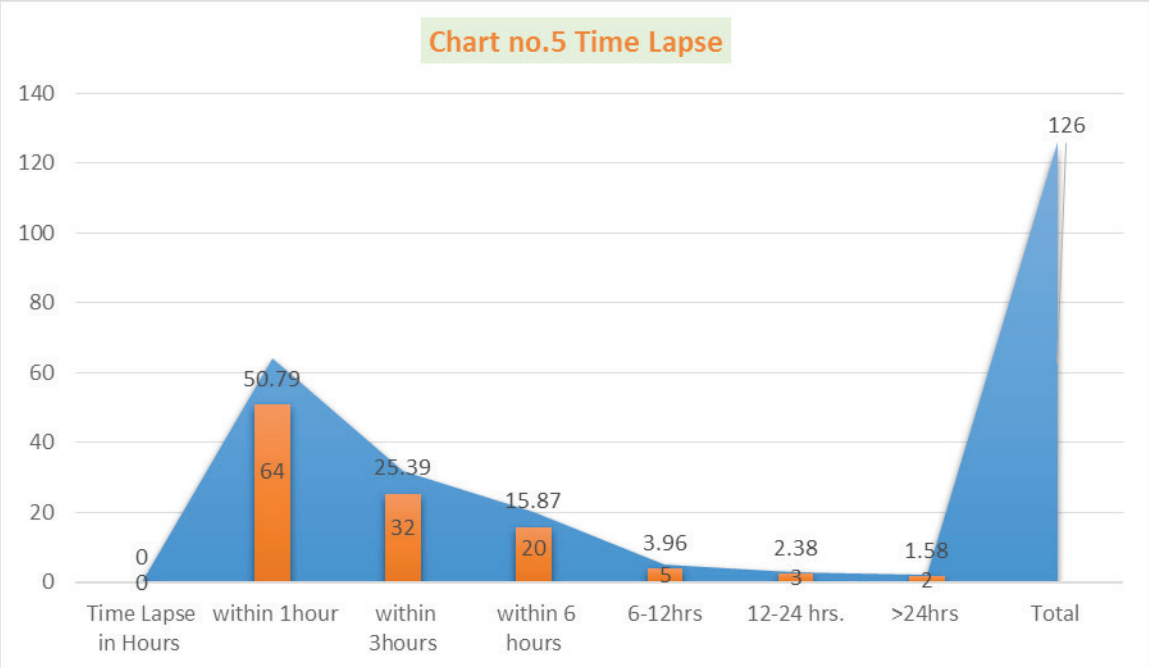
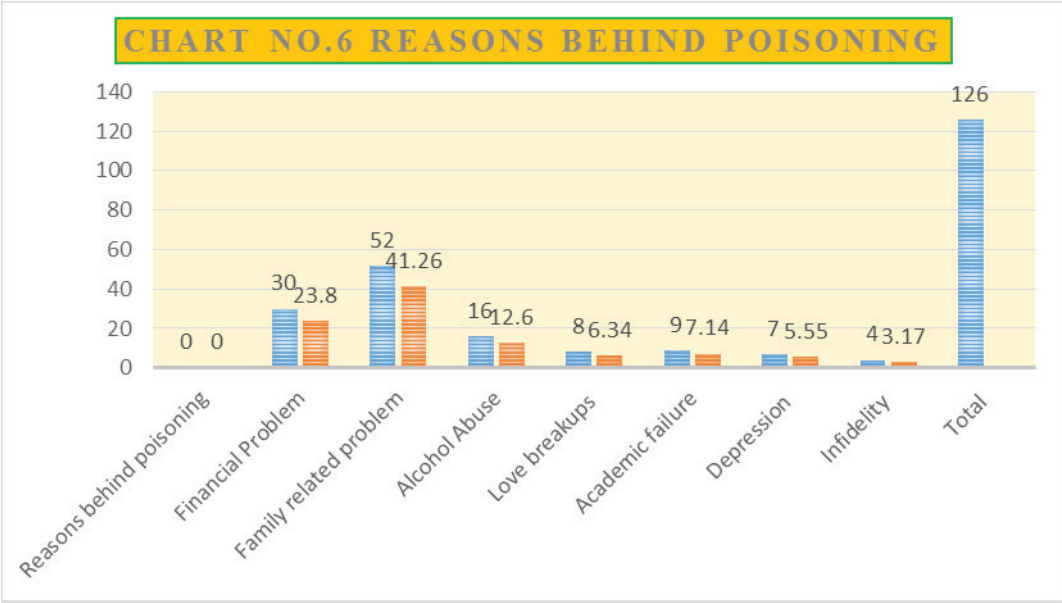


Chart no.5 Time Lapse
140
120
100
80
60
40
20
0
0
0
50.79
64
25.39
32
15.87
20
3.96
5
2.38
3
1.58
2
126
Time Lapse in Hours
within 1hour
within 3hours
within 6 hours
6-12hrs
12-24 hrs.
>24hrs
Total




## Observations and Discussion

- In the present study, the overall mortality was found to be 3.05%. The reasons observed were delay in admission to hospital, improper management of the patient, nature of poison, dose consumed, availability of medical facilities and time interval between intake of poison and medical treatment and lack of information regarding the poison and its antidote. Similar observations were made by other studies.[1-3].

- In our study 59 [46.82%] patients were of 21-30 years followed by 28[22.22%] patients of 31-40 years and 22[17.46%] patients were less than 20 years of age and least 10[7.93%] were from 41-50 years age group. In age of above 60 years, 3 cases were reported. These results were consistent with studies conducted by others. [2-4] Exposure to social, economic, domestic, occupational pressures, early marriages and inability to cope with the post marital pressures especially in rural areas are important factors.

- In the present study, 71[54.34%] patients were male as compared to 55[43.65%] females thus giving a male to female ratio of 13:10**.** Similar patterns were observed by other studies.[2-5] Males are more exposed to stress and occupational exposure compared to females and have easy accessibility to the agrochemicals due to more involvement in agricultural work. This is the main reason for the disparity.

- In our study**,** 87[69.04%] patients were from rural background and in comparison, only 30.95% of the people were from urban background. These results were similar to other studies.[5] Pesticides were the main choice by the victims as these are easily available in rural areas.

- In this study, 92[73.01%] of the victims were Hindu while 20[15.87%] were Muslim and 4 [11.11%] were Christian. Similar results were obtained by studies conducted by others reseachers.[6]

- In this study, we observed that the acute poisoning was most commonly seen in married men [51/40.47%] and women [31/24.60%] while unmarried people were 38[30.15%]. Which could be due to variable income of agriculture workers who come across various stressful situations in their life. This finding is similar with the study done by others.[4-6]

- In our study, severe acute poisoning cases were more likely to occur in low income people [80/63.49%] when compared to middle class [38/30.15%] and people of high socio-economic status [8/6.34%]. Similar observations were noted by others.[5,6]

- We observed that in most cases, poisoning victims

had only primary education [55/43.65%] followed by secondary education in 37[29.36%] cases only 18[14.28%] were graduates while 16[12.69%] were illiterate. This consistent with other studies.[5,6]

- In our study, majority of acute severe poisoning cases were seen in laborers [56/44.44%] followed by house wives [31/24.60%] and farmers [20/15.87%]. Similar findings were made by other studies.[5-7] chart no.1.

- In this study, 82[65.07%] patients consumed poison during the day **(**6 am -6pm) while 44[20.63%] of them consumed it at night (6pm-6am). The consumption during evening hours could be explained as people usually meet at homes after working hours and discuss about their problems leading to frustration resulting in them taking the extreme step. Same observations were noted by other studies.[7,8]

- In the present study**,** 86 [68.25%] victims consumed poison at their home while 22[17.46%] did it at their work place18 [14.28%] of them in a remote place. These were consistent with other studies.[7,8,9] Chart no. 2

- Seasonal trends of acute poisoning: Most of the cases were reported in Rainy season [52/41.26%] followed by Winter [41/32.53%] and Summer [33/26.19%]. The increased incidence during the rainy season could be attributed to increased availability of pesticides, frustration resulting from the loss of crops as a result of excessive or inadequate rains. Similar trends were observed by other studies.[7-9] Chart no.3

- In the present study on acute poisoning cases, it is seen that the Organophosphorus insecticides account for 47[37.30%] cases and poisoning by snake bite for 18[14.28%] cases. There is a rapidly increasing trend in the incidence of OPC poisoning over the last few years due to easy availability and uncontrolled sale and use of these agents. Due to greater exposure in fields, there is a great risk of posing by snake bite especially in rural agriculture workers and laborers. Similar results were reported by various studies conducted by other authors.[6-10] Chart no.4

- In our study, out of this insecticide group, carbamate was responsible in 13 [10.31%] cases followed by organochlorine compounds in 10 [7.93%] cases. The difference in the type of poisoning seen within the country may be due to the difference in the pattern of use and availability of pesticides in various parts of the country. This is consistent with other wokrs.[7-10]

- In the present study, 98[77.77%] patients consumed the poison with suicidal intent while in 26[20.63%] cases, the exposure was accidental. However, in 2[1.58%] cases, the intention was homicidal. Similar observations made by others.[7-13] It appears that the easy availability of OPC, low cost coupled with their faster and more effective action probably makes it a favorite poisoning agent for suicidal purpose. It was seen on psychiatric assessment that majority of the suicidal cases were associated with reactive depression. Accidental poisoning especially with kerosene was more common in alcoholics and was observed in 8[6.34%] cases.[7-13] In our study, snake bites were responsible for accidental poisoning in 18[14.28%] cases as this region has more snakes and agricultural population. These results were consistent with other researchers.[7-13]

- In our study, 64[50.79%] of the acute poisoning patients were hospitalized within the first one hour of toxic exposure while 32[25.39%] of them were admitted between 1-3 hrs. However, 20[15.87%] of them were brought in less than 6 hrs. after toxic exposure. The remaining 10 patients were hospitalized between 6 hours to 24 hours of toxic exposure. The early reporting to the hospital after poisoning had greatly affected the case of fatality and similar observations were made by previous works.[10-14] chart no.5

- In present study, 88[69.84%] patients consumed highly toxic and fatal dose of poison whereas 38 [30.15%] patients consumed mild toxic and fatal dose of poison. There is a variability of symptoms and signs depending on the nature of the compound, amount consumed, absorption, time gap between exposure and presentation to the hospital. Similar outcomes were also observed in other studies.[13,15]

- In the present study, a rather high 106 [84.12%] patients received first aid while 20[9.52%] people did not receive first aid as they were close to the hospital and were brought immediately. Similar findings were made by others.[12-16] Regarding role of first aid, it plays an important role in mortality and morbidity.

- 60[47.61%] patients had to stay in hospital up to 7 days while 24[19.04%] stayed in the hospital for 3 days 24 [19.04%] patients had to stay only for one day in hospital. However, in two poisoning cases, patients had to stay in hospital for more than 30 days. These were consistent with studies conducted by others.[14-18]

- In this study, 88[69.84%] recovered as they reached hospital within 3 hours and were managed properly.

- Delay in transfer of the patients from remote places to hospital leads to delay in treatment which may cause more damage to their organs and lead to death. This was seen in 38[30.15%] cases. Overall mortality in the present study is 3.05%. Same outcomes were obtained by other studies.[18-20]Among the total deaths, reported majority of them arrived at hospital after 3 hours. Mortality due to poisoning depends on various factors including age, toxicity of the poison, amount consumed, health status of the patient, early hospitalization and proper management. Cause of death was refractory hypotension with severe metabolic acidosis and respiratory failure along with secondary complications.

- In the present study, the most common causes were family problems seen in 52 [41.80%] cases followed by financial problems in 30[23.80%] cases. The motives depend on the variety of factors such as economic crisis, stress, rain dependent agriculture, natural calamities etc. Unemployment, chronic illness, quarrels and love failure were the other contributory factors in suicides. It was seen from our study on psychiatric assessment of all suicidal attempt cases that majority of cases were associated with acute stress reaction. Similar findings also observed by other studies.[20-22] chart no.6

- Alcohol presented as an associated inebriant in 28 cases may explain the fear of death in these people. These were similar to other researchers.[20-22]

**Preventive Measures**

The changing trends of poisoning need proper health care policy planning for early proper diagnosis and effective treatment of such cases.

Strict rules must be followed regarding sale of pesticides.

## Conclusions

- The overall mortality is 3.05%.

- Most of the victims were married Hindu Rural Laborers of low socio-economic groups.

- Most of them consumed poison at home in the evening hours during monsoon.

- The trends of acute poisoning cases indicated that Organophosphorus insecticides and poisoning by snake bite were the commonest types of poisoning.

- It was seen on psychiatric assessment, that majority of the suicidal cases were associated with reactive depression, consumed the poison with suicidal intent.

- Majority of the acute poisoning cases were hospitalized within one hour of toxic exposure after receiving first aid.

- Maximum number of patients stayed in hospital for up to 7 days and recovered.

- In the present study, family problems and financial problems were the most common reasons behind poisoning.

**Conflict of Interest:** Nil

**Source of Funding**: Self

**Ethical Clearance:** Obtained

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# Correlation between various Measurements of Sternum with Stature - An Autopsy based Study

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## Abstract

The sternum is of crucial significance while estimating body stature. Dwight, in the late 19th century, discussed potential use of the sternum for estimation of the stature. Various researchers have shown that the sternum may be of use in stature assessment merely when long bones are not obtainable. The study was conducted to analyse the correlation between the stature and various measurements of the sternum. The posterior curved length, length of manubrium, length of mesosternum and length of sternum were measured in 300 adult sterna. The mean length of a cadaver (Stature) was observed to be greater in males (162.34 ± 8.03 cm) as compared to females (156.53 ± 8.50 cm). A positive moderate correlation (R ranging from 0.332 to 0.647) was observed between various measurements of sternum with stature in both the genders. Sternal length shall be considered as a better parameter over other sternal measurements for estimating the stature. However the application for utilizing the sternum for stature estimation should be restricted to the population sample for and from which they have been developed.

***Keywords:*** *Stature estimation; sternum; posterior curved length of sternum; forensic anthropology.*

## Introduction

Estimation of stature is an essential component in the estimation of an individual's identity from mutilated or dismembered or fully skeletonised remains in forensic casework. Karl Pearson (1899) and thereafter Trotter and Gleser (1952) derived regression equations for estimating the stature using long bones which are being used worldwide for a long period of time.[1,2] A number of other bones like skull, metacarpals, metatarsals, scapula, lumbar vertebrae and sacrum have also been used for the estimation of stature.[3,4,5,6,7,8] The osseous skeleton of the sternum is the structure which is observed to resist the effects of putrefaction and decomposition for a long period of time.

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The sternum is of crucial significance while estimating body stature. Dwight, in the late 19th century, discussed potential use of the sternum for estimation of the stature.[9] Various researchers have shown that the sternum may be of use in stature assessment merely when long bones are not obtainable. Recent studies have led to the development of regression equations for the estimation of stature in several different population groups. Menezes RG et al.[10,11] and Singh J et al.[12] have assessed the usefulness and the importance of macerated sternum in the estimation of stature in two different Indian adult populations.

The present study was conducted to analyse the correlation between the stature and various measurements of the sternum and to derive regression equations for the estimation of stature in males and females.

## Materials and Method

This study was conducted after the ethical clearance from institute's ethics committee for academic research projects in deceased that were subjected to medicolegal

autopsy at a post-mortem centre attached to a medical college in Mumbai, India. The deceased aged 18 years and above, of either sex without trauma to sternum were included in the study. During the study period from November 2014 to August 2016, 300 adult sterna were examined. Primary data, in each case, was collected from the inquest report and hospital indoor paper records in admitted cases.

During the autopsy, the deceased was put in a supine position on a flat, hard-surfaced autopsy table, with the knee and hip joints extended, and the neck and feet in a neutral position after breaking the rigor mortis. The cadaveric length (stature) was measured from the vertex up to the heel using a steel measuring tape. After removing the sternum from the thoracic cage, the sternal margins that articulate with the cartilages of the first seven pairs of ribs were carefully dissected. The soft tissue was scraped and measurements were taken using a measuring tape. The posterior curved length of the sternum (PCL), length of manubrium (M), length of mesosternum (B), length of sternum (S) were noted keeping the bone on a flat surface. The xiphoid process was not taken into consideration in the present metric study to measure the length of sternum because of the high variability of its length.[13]

Study parameters were described using descriptive statistics like mean, standard deviations and p-values. The correlation between the various measurements of the sternum and stature analysed by calculating Pearson's correlation coefficient, coefficient of determination and standard error of estimate using SPSS v16.0 (SPSS, Inc., Chicago, IL).

## Results

In the study, 300 adult intact sterna were examined, 150 (50%) were of males and 150 (50%) of females. The mean age of males was 43.83 ± 14.93 years and that of females was 39.98 ± 18.92 years. A p-value of 0.0518 indicates no significant difference between the mean age of males and females. The mean length of a cadaver (Stature) was observed to be greater in males (162.34 ± 8.03 cm) as compared to females (156.53 ± 8.50 cm). The mean of all the sternal measurements was greater in males as compared to females except that of the length of manubrium (M). P-value <0.05 in all parameters indicates a significant difference in sternal parameters between males and females **(Table 1).**

**Table 1 Study population and descriptive statistical data for various measurements of sternum**

| **Variables** | **Males N=150** | | **Females N=150** | | **P value** |
|---|---|---|---|---|---|
| | **Range** | **Mean±S.D** | **Range** | **Mean±S.D** | |
| Age (years) | 18-84 | 43.83±14.93 | 19-90 | 39.98±18.92 | 0.0518 |
| Stature (cm) | 145-178 | 162.34±8.03 | 134-175 | 156.53 ±8.50 | <0.0001 |
| PCL (mm) | 124-185 | 140.37±12.90 | 115-185 | 135.10±11.09 | 0.0002 |
| M (mm) | 34-65 | 42.58±5.74 | 35-65 | 46.06±4.66 | <0.0001 |
| B (mm) | 83-140 | 97.40±10.79 | 75-120 | 87.72±8.40 | <0.0001 |
| S (mm) | 119-188 | 139.98±14.40 | 110-175 | 133.94±11.78 | <0.0001 |

PCL – Posterior curved length of sternum, M – Length of manubrium, B - Length of Mesosternum, S - Sternal length.

**Table 2 Linear regression equations for stature estimation from various sternal measurements in males (N=150) and females (N=150).**

| Group | Variables (mm) | R | R2 | Adjusted R2 | SEE (cm) | Regression equations Stature (cm) =aX+b | P value |
|---|---|---|---|---|---|---|---|
| Male | PCL | 0.424 | 0.179 | 0.174 | 7.294 | =0.264×PCL+ 125.33 | <0.0001 |
| | M | 0.332 | 0.110 | 0.104 | 7.595 | =0.464×M + 142.58 | .000033 |
| | B | 0.380 | 0.144 | 0.139 | 7.448 | =0.283×B+ 134.82 | <0.0001 |
| | S | 0.417 | 0.173 | 0.168 | 7.319 | =0.232×S +129.83 | <0.0001 |
| Female | PCL | 0.628 | 0.394 | 0.390 | 6.639 | =0.481×PCL+ 91.525 | <0.0001 |
| | M | 0.569 | 0.323 | 0.319 | 7.016 | =1.037×M + 108.786 | .000033 |
| | B | 0.561 | 0.315 | 0.310 | 7.062 | =0.567×B+ 106.779 | <0.0001 |
| | S | 0.647 | 0.418 | 0.414 | 6.506 | =0.468×S +129.93842 | <0.0001 |

R- Pearson's correlation coefficient

$R^2$ - Coefficient of determination

SEE - Standard error of the estimate,

aX+b -'a' is the regression coefficient of slope or independent variable (sternal lengths), 'X' is the sternal measurement and 'b' is the regression coefficient of intercept/or dependent variable (stature).

Positive moderate correlations were observed for posterior curved length of the sternum (PCL), mesosternal length (B), sternal length (S) and manubrial length (M) with stature in males and females. The correlation coefficient (R) was observed to be higher in females than that in males for all sternal measurements. In males better correlations for PCL (R = 0.424) and sternal length (R = 0.417) were found than that of length of manubrium (R = 0.332) and length of mesosternum (R = 0.380) with significant p values. In females better correlations for PCL (R = 0.628) and sternal length (R = 0.647) were found than that of length of manubrium (R = 0.569) and length of mesosternum (R = 0.561) with significant p values **(Table 2).** Simple linear regression analysis was done for the different sternal lengths to derive regression formulae for estimation of stature. The $R^2$ (Coefficient of determination) and standard error of estimate (SEE) were calculated to assess the significance of a regression as shown in **Table 2.** $R^2$ determines the degree of association of correlation that exists between sternal measurements and the stature, higher the value of $R^2$, better the regression equation as a predictive device. The SEE estimate measures the accuracy of the estimated figure, smaller is its value, better will be the estimates.

## Discussion

The mean length of male cadavers (162.34 ± 8.03 cm) was observed to be more as compared to that of females (156.53 ± 8.50 cm). The study population, sample size and mean length of cadaver (Stature) observed in the other Indian studies is charted in **Table 3**. The mean length of male cadavers observed by Singh J et al.[12], Menezes RG et al.[10,11], Ranjith Raj VP et al.[14] and Saraf A et al.[15] is comparatively on the higher side than that observed by Tumram NK et al.[16], Baraw R et al.[17] and in the present study. The mean length of female cadavers is observed to be relatively similar in all the studies except that of Saraf A et al.[15] **(Table 3).**

**Table 3 - Study population, sample size and mean length of cadaver (Stature) observed in the Indian studies.**

| **Source and study population** | **Sample Size (N) and mean length of cadaver (Stature) in cm ± SD** | | | |
|---|---|---|---|---|
| | Male | | Female | |
| Menezes RG et al. (South India) | N=35 | 166.47 ± 7.22 | N=40 | 155.88 ± 5.27 |
| Singh J et al. (Northwest India) | N=252 | 168.1 ± 7.19 | N=91 | 156.3 ± 6.98 |
| Tumram NK et al. (Central India) | N=92 | 160.8 ± 8.8 | - | - |
| Baraw R et al. (Delhi) | N=50 | 162.76 ± 7.3 | N=50 | 156.14 ± 7.3 |
| Ranjith Raj VP et al. (South India) | N=50 | 171.2285 | - | - |
| Saraf A et al. (South India) | N=50 | 166.90 ± 3.20 | N=50 | 164.4 ± 3.50 |
| Present Study (Mumbai) | N=150 | 162.34 ± 8.03 | N=150 | 156.53 ± 8.50 |

**Table 4- Sternal measurements and correlation coefficients observed in various Indian studies.**

| **Source** | **Parameters** | **Sternal measurements Mean±SD** | | **(R)** | |
|---|---|---|---|---|---|
| | | **Male** | **Female** | **Male** | **Female** |
| Menezes RG et al. | S | 14.20±1.34 cm | 14.12±1.07 cm | 0.638 | 0.639 |
| Singh J et al. | M<br>B<br>S | 52.1±5.21 mm<br>94.1±10.01 mm<br>145.7±11.41 mm | 47.2.1±5.17 mm<br>78.5±10.23 mm<br>124.9±10.12 mm | 0.191<br>0.255<br>0.318 | 0.237<br>0.229<br>0.318 |
| Tumram NK et al. | M<br>B<br>S | 4.65±0.086 cm<br>9.89±0.125 cm<br>14.59±1.441 cm | -<br>-<br>- | 0.44<br>0.25<br>0.55 | -<br>-<br>- |
| Baraw R et al. | PCL* | 20.41±1.64 cm | 18.27±1.64 cm | 0.809 | 0.755 |
| Ranjith Raj VP et al. | S* | 19.2342 cm | - | 0.941 | - |
| Saraf A et al. | M<br>B<br>S | 48.80±6.47 mm<br>86.05±13.86<br>134.86±15.87 | 43.0±5.91<br>78.13±15.05<br>121.14±17.77 | 0.367<br>0.853<br>0.894 | 0.680<br>0.747<br>0.859 |
| Present Study | M<br>B<br>S<br>PCL | 42.58±5.74 mm<br>97.40±10.79 mm<br>139.98±14.40 mm<br>140.37±12.90 mm | 46.06±4.66 mm<br>87.72±8.40 mm<br>133.94±11.78 mm<br>135.10±11.09 mm | 0.332<br>0.380<br>0.417<br>0.424 | 0.569<br>0.561<br>0.647<br>0.628 |

R - Pearson's Correlation Coefficient, *Measurements include xiphoid process.

Menezes RG et al.[10,11] observed a higher correlation coefficient and a lower standard error of the estimate for regression models in macerated and dried sterna. Singh J et al.[12] obtained a correlation coefficient value of 0.316 for males and 0.328 for females for regression models which were based on the sternal length taken from dry bone specimens. Saraf A et al.[15] in their study observed that the stature correlated best with the combined length of sternum, among males (R=0.894), females (R=0.859) as compared to manubrium and mesosternum. All these studies[10,11,12,15] suggested that stature can be estimated from sternum with reasonable accuracy and also concluded that sternum may be of vital importance for stature estimation if long bones are not available. Yonguc G et al.[18] in Turkey observed moderate to strong correlation (R ranging from 0.372 to 0.850) and suggested that the sternal lengths can be used for estimation of sex. They also stated that a sternum is a useful tool for estimating stature when other skeletal bones are not available **(Table 4).**

Baraw R et al. [17] in their study measured PCL of the sternum in fresh and dry samples of the sternum and observed correlation coefficient of 0.872 and 0.610 respectively. They concluded that PCL of sternum acts as an alternative to estimate stature in Delhi population. Ranjith Raj VP et al.[14] observed a correlation coefficient of 0.9410. They concluded that the length of the sternum is a strong correlating factor to the stature of South Indian adolescent male population and it is useful for anthropologists and medico-legal experts for stature estimation. Baraw R et al.[17] and Ranjith Raj VP et al.[14] observed strong correlation coefficients in their study while in both the studies the sternal measurements were taken including the xiphoid process which has high variability in its length.[13] However, Marinho Let al.[19] reported a correlation of 0.329 on fresh sterna sample in a male which also includes the xiphoid process. They also argued that sternal length has inadequate forensic value and comparatively low dependability in determining stature from mutilated human skeletal remains, either skeletonised or fresh **(Table 4).**

Tumram NK et al.[16] derived linear regression equations by measuring manubrium, mesosternum and the total sternal length. The regression model provided a correlation coefficient of 0.55. The study concluded that sternal length in relation to body stature shows a moderate positive correlation and relatively low reliability in estimating stature, and has limited forensic value.

In the present study, positive moderate correlation (R ranging from 0.332 to 0.647) was noted between PCL of the sternum, sternal length, manubrial length and mesosternal length with stature in both the genders. Sternal length is the most significant predictor for stature among male gender and female. However, the accuracy of prediction is higher among females compared to males [R2=41% vs 17%]. The PCL of the sternum showed correlation coefficient of 0.424 in males and 0.628 in females, it was 0.872 in the study of Baraw R et al.[17] including the xiphoid process **(Table 4).** Overall all the sternal lengths display relatively moderate correlation coefficients with stature and relatively high standard errors of estimate in regression analysis **(Table 2)**.

## Conclusion

Many researchers have shown that the sternum may be of use in stature assessment merely when long bones are not obtainable. Sternum carries ethnic variations, in view of gross population variation in metropolitan cities; the observations derived from multiple studies are of meagre significance. The application for utilizing the sternum for stature estimation should be restricted to the population sample for and from which they have been developed. Sternal length shall be considered as a better parameter over posterior curved length, the length of manubrium and length of mesosternum for estimating the stature if at all being used.

**Source of Funding**-None

**Ethical approval**: The study was conducted after the ethical clearance from Institute's Ethics Committee for Academic Research Projects vide approval letter number ECARP 2014-57. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Conflict of interest statement:** The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript.

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# Assessment of Depression among the Housewives of Alcohol Consuming Husbands in Selected Community Areas, Kancheepuram District, Tamilnadu

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## Abstract

Assessment of depression among the housewives of alcohol consuming husbands in selected community areas, Kancheepuram District, Tamil Nadu. Aim of the study is to Assessment of depression among house wives. The objectives are to determine the level of depression among house wives of alcohol consuming husband, to find out the association between the level of depression with their selected demographic variables of the house wives of alcohol consuming husband.169 samples are selected by purposive sampling techniques. Data collected by using Beck's Depression scale.

The data collected period was for one week. The collected data was tabulated and analyzed. Descriptive and inferential statistical were used. The results are majority 53% of house wives having depression and Minority 47% of house wives did not having depression.

Assessment of demographic variables regard to Factors associated with the level of depression among the demographic variables, Family type,family monthly income ,Frequency of consuming alcohol,Variables like Age,Educational status of wife, Educational status of husband, Employment status of husband,Problem after alcohol consumption,Physically abuse after consumption of those Demographic variables doesn't has significant association.

***Keywords:*** *Assessment, Depression, Alcohol, Wife and Level.*

## Introduction

Alcoholism, now known as alcohol use disorder, is a condition in which a person has a desire or physical need to consume alcohol, even thought it has a negative impact on their life. Alcohol misuse also contribute to poor performance at school, and work, Family problems, unprotected sex, violence and depression. There are a considerable number of anecdotal reports This women faced social, emotional, physical, mental health, also violence and anxiety. The alcoholic addiction of the husband can create significant mental trauma and physical health problems to the and research findings that women's were getting married to alcoholics husbands. wife.[ 9)]

According to the **NATIONAL INSTITUTE OF ALCHOL ABUSE AND ALCOHOLISM**, It state the problems for spouse - Marital conflict, Infidelity, Domestic violence, Unplanned pregnancy, Financial instability, Stress , Jealousy and Divorce. These wives suffer from various stressors due to their husband's alcohol dependence.[(8)]

According to **TIMES OF INDIA 2017** Tamilnadu is one of the high alcohol consuming state 47.4% men in rural areas and 46% men in urban areas .In **INDIA** 30% population consumes alcohol. In global states report to the **Worldwide** 6.2 litres of alcohol is consumed per person in the age of 15,15+ and older. The most negatively affected spouse and children of alcoholic. However less attention has been focused on them so far. [(7).]

The wives of the alcoholics are an 'Unknown Universe' in Indian Society. Clinical work and some research suggest that partner responses to drinking may either facilitate or hinder treatment acceptance and

recovery efforts. Hence the reason for taking up this study is justify.[6]

## Objectives

- Determine the level of depression among house wives of alcohol consuming husband.
- To find out the association between the level of depression with their selected demographic variables of the house wives of alcohol consuming husband.

## Research Methodology

Research methodology deals with the description of the methods and different steps in collecting and organizing data from the investigation. It includes description of the research approach, research design, setting, population, sample and sample size, the sampling technique, sampling criteria, development and description of the tool, data collection procedure and the plan or analysis in the study.

**Sampling Criteria**

**Inclusion Criteria**

- Who are available at the time of data collection.
- Who can read and write tamil

**Exclusion Criteria**

- Who are not willing to participate in study.
- With existing mental illness.

**Method of Data Collection:**

In this present study the researcher distributed the demographic variables proforma and standardized Becks depression scale to the samples. Each sample will take 30 minute to completion of the data. Data collection period was for one week (from 23-4-2019 to 28-04-2019) at community area(poonjeri and payanoor) in that 169 Housewives.

## Data Collection Procedure

The written informed consent was obtained from the parent and guardian as well as from the study participants. Permission letter was obtained from the HOD of Mental Health Nursing department, HOD of Community Health Nursing department, Community area, UG Committee and Human Ethical Committee.

Descriptive statistics like frequency distribution, percentage and inferential statistics like chi square was used to analyze the data.

**Research tool**

There are Two Section (A&B) Section A consist of self-Structured Questionnaires to assess demographic variable & Section B Standardized Beck's Depression scale (short form) to assess the Depression among housewives of alcohol consuming husbands. It consist of 15 questions

**Scoring Pattern:**

| SCORING | **INTERPRETATION** |
|---|---|
| **0-5** | NORMAL |
| **ABOVE 5-15** | DEPRESSION |

**Table: 1 Frequecny and percentage distribution of sample with prevalence of depression among the house wives of alcohol consuming husbands.**

| Category | Normal | Depression | Results |
|---|---|---|---|
| Age<br>20 25<br>26 30<br>31-35<br>Above 35 years | <br>3<br>16<br>33<br>27 | <br>4<br>20<br>40<br>26 | <br>X2=0.5638<br>PVALUE=O.904664<br>NS |
| Educational status of wives<br>No formal education<br>Primary school<br>Secondary school<br>Degree or above | <br>4<br>42<br>21<br>12 | <br>4<br>50<br>22<br>14 | <br>X2=0.1574<br>PVALUE=0.984148<br>NS |
| Educational status of husband<br>No formal education<br>Primary school<br>Secondary school<br>Degree or above | <br>5<br>39<br>29<br>8 | <br>4<br>37<br>35<br>12 | <br>X2=1.2384<br>PVALUE=0.743804<br>NS |
| Family type<br>Nuclear<br>Joint<br>Extended family<br>Others | <br>64<br>15<br>1<br>1 | <br>53<br>34<br>2<br>1 | <br>X2=9.4556<br>P VALUE=0.23809<br>S |
| Employment status of husband.<br>Employed<br>Unemployed. | <br>74<br>5 | <br>78<br>12 | <br>$X^2$=2.2813<br>P VALUE=0.130942<br>NS |
| Family monthly income.<br>a.5000 10000Rs<br>b.10000 15000Rs<br>c.15000 20000Rs<br>d. Above 20000Rs | <br>10<br>27<br>36<br>13 | <br>3<br>39<br>22<br>19 | <br>$X^2$=10.4054<br>P VALUE=015417<br>S |
| How often your husband consume alcohol.<br>a. daily<br>b. alternative day<br>c. weekly<br>d. occasionally | <br>10<br>21<br>37<br>11 | <br>28<br>38<br>16<br>8 | <br>$X^2$=21.5949<br>P VALUE=0.000079<br>S |

***Cont....*** **Table: 1 Frequecny and percentage distribution of sample with prevalence of depression among the house wives of alcohol consuming husbands.**

| | | | |
|---|---|---|---|
| does your husband create the problem after consumption of the alcohol<br>a. yes<br>b. no | 20<br>57 | 38<br>51 | $X^2$=4.7075<br>P VALUE=0.14514<br>NS |
| does your Husband physically abuse after consuming the alcohol<br>a. yes<br>b. no | 16<br>63 | 25<br>65 | $X^2$= 1.2964<br>P VALUE=254876<br>NS |

NS-NON SIGNIFICANT , S-SIGNIFICANT, P=<0.05

**TABLE 2: Frequency and Percentage Distribution of Assessment of depression among the wives of alcohol consuming husbands.**

**N-169**

| ASSESSMENT OF DEPRESSION | FREQUENCY | PERCENTAGE |
|---|---|---|
| DEPRESSION | 90 | 53% |
| NORMAL | 79 | 47% |
| TOTAL | 169 | 100% |

## Result

The study finding revealed that,

In previous study Assessment of Depression among the housewives of alcohol consuming husbands Shows that,

- Vishal A Shah, prakashbehere, KK Mishra (2017) conducted a cross section controlled study on Psychiatric Morbidity among Spouses of Men with Alcohol Dependence in Maharashtra. The sample size 50. data were collected electronically on the GMHAT-PC. A computerized clinical assessment tool. The results of the study shows,Anxiety (16%) and depression (36%) were higher in wives of alcohol-dependent men. Stress was higher (6%) in cases as compared with controls (4%). When comparing diagnosis and age-wise distribution, depression was higher in cases (28%) as compared with controls (14%) in age group of 31 to 40.(5)
- Nitasha Sharma, Sunith Sharma, santhiyaghai, deepikakumara,dharmaveersingh et al(2016) conducted a study on living with an alcoholic partner problem faced and coping strategies used by wives of alcoholic client .Descriptive research design was used .sample size was 30.The problems were identified using a non standardized 17 item structured questionnaire while coping in wives of alcoholics was assessed using standardized tool. The result shows that most highly reported were the emotional problem and least reported were the problem of physical violence.(4)
- In this study shows majority of the people 53% of the women having depression and 47% of women did not having depression.

Regard to age: 73(44%) of the wife belong to the age 31-35 years, 53 (30%) above 35 years, 36 (22%) of them 26-30 years, 7 (4%) of them 22-25 years, Regard to educational status of wife: 92(55%) has completed primary education, 43 (25%) has completed higher

education, 26 (15%) are graduates and 8 (5%) are illiterate, Regard to educational status of husband:76 (45%) has completed primary education, 64 (38%) has completed higher education, 20 (12%) are graduates and 9 (5%) are illiterate, Regard to family type:116 (69%) of them is nuclear, 48 (28%) of them f is joint, 3 (2%) is extended and 2 (1%) is others, Regard to employment status of the husband: 152(90%) of them are employed and 17 (10%) are unemployed, Regard to years of consuming alcohol:47 (80%) of the husband consuming for 1-3 years, 55 (33%) of them less than a year, 18 (11%) of them for 3-7 years and 16 (9%) of them above 7 years, Regard to family monthly income: 66 (39%) are Rs. 10,001-15,000, 58 (34%) are Rs.15,001-20,000, 32 (19%) are above Rs. 20,000 and 13 (8%) are Rs.5000-10,000, Regard to frequency of consuming alcohol: 59 (35%) of them consuming alternatively, 53 (32%) drink weekly, 38 (22%) drink daily, 19 (11%) drink occasionally, Regard to problems in home after consumption of alcohol:110(65%)has no problems after consumption of alcohol and 59 (35%) has problem in home after consumption of alcohol, Regard to physical abuse after consumption of alcohol: 128 (76%) of the wives are not abused and 41 (24%) of the wives are abused.

## Disscussion

It shows,And Factors associated with the level of depression among the demographic variables, Family type, family monthly income ,Frequency of consuming alcohol ,Variables like Age, Educational status of wife, Educational status of husband, Employment status of husband, Problem after alcohol consumption, Physically abuse after consumption of those Demographic variables doesn't has significant association.

## Conclusion

This chapter deals with the discussion of major findings of the study . The study findings were presented based on objectives. Discussion of the findings under three main sections viz. Determination of the level of depression, assessment of association of demographic variables with level of depression.

**Source of Funding-** Self

**Conflict of Interest-** Nil.

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Research Article

# A Study to Assess the Knowledge on Oral Health and Self Esteem among Young Adults in Selected College, in Kancheepuram District, Tamilnadu, India

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## Abstract

"A study to assess the knowledge on oral health and self-esteem among young adults in selected college, Kancheepuram district, Tamil Nadu, India". The objectives are to assess the knowledge on oral health among college students and to assess the self-esteem among college students and to correlate the knowledge on oral health and self-esteem among college students and to associate the knowledge on oral health and self-esteem with selected demographic variables among college students. The convenience sampling was used to select 100 young adults. The data collection tools were validated and reliability was established. The data was collected from the students in selected college. The collected data was Tabulated and Analysed. The results revealed that Majority of young adults were female 53% and 43% were males. Majority of young adults were in78% got information through mobile phone 9% were got information through newspaper 8% of young adults got information through television and 5% of young adults get information through health professionals.

Present study result shows that Mean score of knowledge was 24.58 and mean score of self-esteem was 28.18. There was statistically mild positive correlation was found between the level of knowledge and the level of self-esteem. There is no statistically significant association between selected demographic variables and the level of found knowledge. There is an statistically significant association found between frequency of brushing and frequent rinsing of mouth and level of self-esteem and there is no statistically significant association found between demographic variables.

***Key Words**: Oral health,Self Esteem,Young Adult,Knowledge.*

## Introduction

The holistic view of health, which is widely accepted today, sees human life as a total system. The world health is etymologically related to the word - wholeness. Holistic health implies that all aspects of the total system of an individual are in balance with each other. Children are the priceless resource and a nation which neglects them does so at its peril[1].

Adolescence is the critical time period when skills and attitudes of individuals are taking shape. Due to fast physiological changes going down in a young person, a consciousness and magnified interest concerning one's own body develops.The body image will bring a way of fun, pride, timidness or maybe unhappiness. Knowledge about the prevalence and frequency of different types of dental problems and the need for treatment is important. (2)

It is an amount hard-to-please important adjustment to the physical and social changes that distinguish childhood behaviour from adult behaviour. The stage of puberty brings in anumberofphysicalandphysiologicalchanges. Theperiodofadolescencenotonly brings physical changes but also psychological changes that make the child a qualitatively different person. These changes affect the personality and adjustment in later life.(3)

The youth population is burgeoning in some countries, and in these areas and elsewhere adolescents are confronting new situations and threats to their present health, moving towards a future in which their health status is likely to be compromised. The health, education and social sectors are called upon to devise, test and make wider use of effective new approaches, including operational, social science and community-based research, clinical studies and longitudinal surveys focused on adolescents and youth. Often slow to recognize the essential value of the inter-sectorial approach in meeting the needs of the population, public health institutions in particular need to provide services and train personnel to make sure that no juvenile person slips through the cracks in health care(4).

Apart from the impact on biological process standing, poor dental health can even adversely have an effect on speech and vanity. Dental diseases impose both financial and social burdens as treatment is costly and both children and adults may miss time from school or work because of dentalpain[5].

The dental problems more common among adolescents are Dental caries, Malocclusion, Periodontal disease, Bimaxillary proclination, Fractured teeth, Missing teeth, Discoloration of teeth. The causes can be poor oral hygiene, infection, lifestyle, accidents (6)

The impact of oral diseases, pain, suffering, impaired function and reduced quality of life, is both extensive and expensive. Most of the time managing of such problems is beyond the resources of many developing countries. Dental diseases are widely prevalent, more so in the developing countries like India. Dental health education is an integral part of dental health services and has been provided in various settings like dental office and dental institutions, school and other educational institutions(7).

Dental diseases are widely prevalent, more so in the developing countries like India. Dental health education is an integral part of dental health services and has been provided in various settings like dental office and dental institutions, school and other educational institutions (8).

No matter the temporal order of the physical changes that come about throughout adolescence, this can be a amount during which physical look unremarkably assumes preponderant importance. Both girls and boys are known to spend hours concerned about their appearance.(9)

Issues of oral health revolve almost exclusively around dental caries and it is very important in developing countries like India. Dental caries incidence begins within the permanent teeth at concerning six years with the eruption of central incisors and initial molars. Among kids five to eleven years more matured, twenty sixth have older one or additional lesions in permanent teeth; this proportion will increase to sixty seven among adolescents twelve to seventeen years of age.(10)

A longitudinal study was conducted to assess the extent of dental anxiety among young adults. Data were collected from 697 youngsters whose age is from 16 to 19 yrs. The study results showed that women expressed 7.73 % anxiety which was more than in men 6.78%.(11)

The psychological problems touching folks that should agitate the loss of a tooth, in addition as make a case for however this loss will have an effect on the standard of life. The most important impact of tooth loss is on |he looks and social relations element of quality of life as a result of folks cannot modification their appearance with missing teeth.(12)

A study found that once subjects went through associate some 20-minute long interview with associate queried that they believed had an occasional opinion of them, their vanity was markedly lower after the interview. Poor physical appearance leads to a lowered opinion by others, which logically leads to lower popularity and lack of popularity may undermine self-esteem and self-confidence.13

Adolescents (10-19 years) form a large section of population – about 22.5 %, that is, about 225 million. They are living in diverse circumstances and have diverse health needs (Census 2001). (14)

The largest and the most important group that may be reached by health education is found in the school system.15

## Materials and Method

A Quantitative, Evaluative research approach was appropriate for the study.Non interventional descriptive research design was most appropriate for the study. The

participants of the study will be selected by convenient sampling technique. The sample size 100 who fulfil the sampling criteria.

Age from 18 years to 25 years, Both male and female gender who are willing to participate in the study and who understand Tamil and English were included in the study. Those who are not willing to participate in the study and not available at the time of data collection were excluded from the study. Standardized administered questionnaire was used to elicit demographic variables and self-esteem scale was used to assess level of knowledge on oral health and self-esteem among young adults and score was interpreted as follows 88-120 high self-esteem ; 57-88 moderate self-esteem ; 24-56 low self esteem .

## Finding and Discussion

**Knowledge:**

The majority of young adults (65 %) were in age group of 18 to 20 years ,46% were 3rd year ,(63%) were religion Hindu ,85% were in source of drinking water purified water, 87% were belongs to non-veg , 78% were in get information through mobile phone.

There is no statistically significant association between selected demographic variables and the level of found knowledge.

**Selfesteem**

76% of young adults had average level of knowledge where as 24% of them had good knowledge on oral health among young adults 26%, 54% and 20% had low, moderate and high level of self-esteem respectively.

There is an statistically significant association found between frequency of brushing and frequent rinsing of mouth and level of self-esteem and there is no statistically significant association found between demographic variables.

**Table 1 : Distribution and Association of Knowledge on oral health and self Esteem with selected demographic variables among college students.**

| S.N | Variables | Frequency & Percentage | Knowledge $\chi 2$ | Self Esteem $\chi 2$ |
|---|---|---|---|---|
| | | | | |

**Table 2 :- Correlation between Knowledge on Oral Health with Self Esteem**

| Aspects | Mean | SD | γ value |
|---|---|---|---|
| Knowledge | 24.58 | 5.115 | 0.5115* |
| Self Esteem | 28.18 | 10.722 | |

Mean score of knowledge was 24.58 and mean score of self-esteem was 28.18. There was statistically mild positive correlation was found between the level of knowledge and the self esteem among young adults.

## Conclusion

Present study was conducted to assess the knowledge on oral health andself -esteem among young adults. The results found that there was statistically mildpositive correlation was found between the level of knowledge and the level of self- esteem and also reveals that there is an statistically significant association found between frequency of brushing and frequency rinsing of mouth and level of self -esteem .therefore investigator concluded that oral hygiene practices among young

adults are not following the oral hygiene because of lack of time to go for dental check-up.

**Self-Esteem.**

**Ethical Clearance:** Ethical clearance was obtained from institutional human ethical committee chettinad academy and education. Formal written permission obtained from hospital authorities. Consent was obtained from each participants after explaining the procedure.

**Conflict of Interest –**Nil

**Source of Funding –** Self

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# Knowledge and Attitude of Final Year Medical Students Towards Dentistry and Dental Consultation: A Questionnaire-based Study

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## Abstract

**Background:** Several studies have reported poor awareness and knowledge of dental problems among the medical students. There is lack of literature assessing the knowledge and attitude of medical students about dental consultation. Hence there is need to explore the knowledge of medical students towards dentistry and dental consultation.

**Aim:** The aim of the study was to assess knowledge and attitude of final year medical students towards dentistry and dental consultation

**Material and Method:** This cross-sectional study was carried out among 130 final-year medical undergraduate students studying in Krishna Institute of Medical sciences. A self-administered, close ended structured questionnaire was used to assess the knowledge and attitude of medical students towards dentistry and dental consultation.

**Results:** The knowledge of final year medical students about dentistry was found to be average. The majority of the students responded positively for dental consultation. The attitude of students towards dentistry showed somewhat negative response.

**Conclusion:** Based on the findings of our study, medical curriculum should include dental health and disease related topics to improve the knowledge and attitude of undergraduate medical students. Interdisciplinary collaboration among medical and dental fraternity will benefit the patients at large.

***Key words:*** *Awareness, dental consultation, knowledge, medical students*

## Introduction

Oral health maintained by thorough oral hygiene practices plays a pivotal role in maintenance of good oral and general health. Plaque and calculus (tartar) are the main etiological factors for gingival and periodontal diseases.[1] Plaque contains an array of microorganisms, which initiates an inflammatory response in the periodontal tissues. The inflammation which appears locally in the periodontium, leads to collagen destruction, alveolar bone loss progressing to tooth mobility and sometimes tooth loss. The inflammatory mediators and cytokines released during this inflammation can enter systemic circulation and can initiate or aggravate disease process elsewhere in the body.[2] The two way relationship between oral health and systemic diseases like cardiovascular diseases, diabetes mellitus and pregnancy outcomes has been documented in literature.[3] It is important to control and treat oral and periodontal diseases, so as to reduce the systemic complications, as oral diseases especially periodontal diseases have an impact on systemic health.[4] The prevention and treatment of oral disease is the most acknowledged and efficient method of ensuring oral health.[5]

Medical practitioners and medical students tend to neglect the importance of oral health and its maintenance.[6] Medical practitioners treat only the medical condition and do not emphasize on the oral hygiene and health. The need for medical practitioner to participate in oral health promotion is highly essential in India, as majority of the population are deprived of basic dental and medical facilities. Medical education should incorporate dental diseases and conditions, so that medical student is well versed with oral diseases and refer the patients to dentist for further treatment. With this background, the present study was designed to assess knowledge and attitude of medical students towards dentistry and dental consultation.

## Materials and Method

This cross-sectional study was carried out among final-year medical undergraduate students of Krishna Institute of Medical sciences Deemed to be University (KIMSDU), by using close ended, self-administered structured questionnaire. The students completed the questionnaire under the supervision of a research assistant through one to one interview and the completed questionnaires were collected immediately. Ethical clearance was obtained from institutional ethical committee before commencing the study (Ethical clearance code: KIMSDU/IEC/09/2016). An informed consent was obtained from all the participants before enrolling them into the study. Sample size for the study was estimated using power statistics came to 72, and for convenience sake we have collected data from 130 students present during the data collection period. The study was conducted during the period April 2018 to June 2018 at KIMSDU.

Students who were willing to participate and gave a written informed consent were included in this study. Students having barrier in communication and unwilling to participate in study were excluded.

The structured questionnaire was designed after detailed review of relevant literature to assess the knowledge and attitude of the medical students. The questionnaire consisted of 20 close ended validated questions, out of which 12 assessed the knowledge and eight question assessed attitude.

The Statistical analysis was carried out using Statistical Package for the Social Science software (SPSS Inc. released 2007, SPSS for Windows, Version 16.0, Chicago). Descriptive statistics like mean and percentage were used to analyse the data.

## Results

A total of 130 final year medical students participated in the study; 72 (55%) males and 58 (45%) females. The students were in the age range of 21 to 23 years with mean age of 21.6 years.

Out of the 20 questions in the questionnaire, 12 questions assessed knowledge and eight questions assessed the attitude of the students. (Table 1)

When the students were asked about whether it is necessary to consult dentist every six months, majority of them (78%) responded yes. Forty four students believe that dental procedures are painful. Hundred students said that they had neglected dental pain. Ninety six students believe that dental procedures are not as important as medical procedures. Ninety four students think that medical doctors can treat dental problems. Sixty four students think dental education is just restricted to the teeth. Eighty three students agreed to refer the patients for dental consultation. Ninety seven students believed that dentistry is not as important as medical education. Forty students ignored dental procedures due to fear of pain during dental treatment. Ninety students believed that dental procedures are time consuming. Eighty eight students think that knowledge about dentistry should be included in medical curriculum. Seventy seven students were not aware that ignorance of dental problems can cause medical problems. Hundred and ten students were aware of medical emergency during dental procedures. Fifty five students believed in the myth, that cleaning of teeth can lead to mobility of teeth. Forty two students responded that they suffered from halitosis or bad breath. Eighty seven students agreed that dentist can treat medical problems. Fifty three students felt that dental treatments are mostly unnecessary. Twenty seven students believed that dental treatments are expensive. Ninety nine students thought dental treatment will improve general health. Seventy nine students were unaware that dental treatments are necessary before planning any major medical/surgical treatment.

The knowledge of final year medical students towards dentistry was average and majority of the students responded by giving a positive response for dental consultation. The attitude of students towards dentistry showed somewhat negative responses.

**Table 1: Questionnaire used and the responses in number (percentage).**

| Sr. no | Questions | Yes | No |
|---|---|---|---|
| 1 | Do you think it is necessary to consult a dentist after every six months? | 101 (78%) | 29 (22%) |
| 2 | Do you think dental procedures are painful? | 44 (34%) | 86 (66%) |
| 3 | Have you ever neglected a dental pain? | 100 (77%) | 30 (23%) |
| 4 | Do you think dental procedures are not important as medical procedures? | 96 (74%) | 34 (26%) |
| 5 | Do you think MBBS doctors can treat dental problems? | 94 (72%) | 36 (28%) |
| 6 | Do you think dental education is just restricted to a tooth? | 64 (49%) | 66 (51%) |
| 7 | Would you refer a patient for dental consultation? | 47 (36%) | 83 (64%) |
| 8 | Do you believe dentistry is not as important as medical education? | 97 (75%) | 33 (25%) |
| 9 | Do you think you are ignoring dental procedures due to fear of dental treatment? | 40 (31%) | 90 (69%) |
| 10 | Do you think dental procedures are time consuming? | 90 (69%) | 40 (31%) |
| 11 | Do you think that knowledge about dentistry should be included in MBBS curriculum? | 88 (68%) | 42 (32%) |
| 12 | Are you aware that ignorance of dental problems can cause medical problems? | 53 (41%) | 77 (59%) |
| 13 | Are you aware of any medical emergency during dental procedures? | 110 (85%) | 20 (15%) |
| 14 | Do you believe in myth that cleaning your teeth can lead to mobility of teeth? | 55 (42%) | 75 (58%) |
| 15 | Do you suffer from halitosis or bad breath? | 42 (32%) | 88 (68%) |
| 16 | Can dentist treat medical problems? | 87 (67%) | 43 (33%) |
| 17 | Do you feel dental treatment is mostly unnecessary? | 53 (41%) | 77 (59%) |
| 18 | Do you believe that dental treatments are expensive? | 27 (21%) | 103 (79%) |
| 19 | Do you think dental treatment will improve general health? | 99 (76%) | 31 (24%) |
| 20 | Are you aware that dental treatments are necessary before planning any major medical surgical treatment? | 51 (39%) | 79 (61%) |

## Discussion

Oral health maintenance is a part of general health for all the individuals. Oral diseases not only affect the oral cavity but also have implications on many systemic diseases. The effect of oral and periodontal infections has been documented in many conditions like coronary heart disease (CHD) and CHD–related events such as angina, infarction, atherosclerosis and other vascular conditions; stroke; diabetes mellitus; preterm labor, low birth weight delivery, and preeclampsia; and respiratory conditions such as chronic obstructive pulmonary disease.[7] The medical professionals are the first to encounter the patients, the suggestions and remedies rendered by them makes the patient aware of their problems as well as strategies to prevent its recurrence. The majority of oral diseases are largely preventable when detected during beginning of the disease and treatment is rendered through early intervention.[8]

The medical doctors play an important role in oral health awareness and maintenance through their advice and education of the patients.[9] Medical professionals should have a thorough knowledge and understanding of etiopathogenesis of oral and periodontal diseases and various treatment options available to cater the same. This element becomes very significant in Indian population, as majority of the subjects live in rural areas and are unaware about the importance of oral hygiene and health.

The knowledge of the final year medical students in our study was average and the students had a negative attitude towards dental consultation. More than two third of the our study subjects thought that it is necessary to visit dentist every six months, which is not in agreement to the findings reported by Oyetola EO 2016, this difference can be attributed to negligence towards dental care in Nigerian medical students.[10]

In present study many students thought that dental treatments are painful and they avoided treatment due to fear of pain. These results are in disagreement to the previous study which reported very few medical student had fear of dental pain and majority of the students didn't undergo treatment due to lack of time. Author also reported that large number of medical students agreed for patient referral to dental clinic for treatment of dental problems. These findings are not in accordance to the results of our study, which may be due to lack of exposure to dental problems and their treatment in medical students of the current study.

Neela P K et al found more than fifty percent of their study participants were aware about impact of dental diseases on systemic health.[11] These results are not in agreement with present study wherein sixty percent medical students were unaware about the correlation between dental diseases and systemic health. This justifies that there is a strong need for creating awareness about importance of dental health among the medical students.

Large number of study participants thought that knowledge about dentistry should be included in the medical curriculum. These findings are in agreement with a study conducted by Zhang S et al among the medical and dental students in Hong Kong.[12]

In current study more than 30% of medical students reported that, they suffered from halitosis or bad breath. This result are in accordance to study conducted by Andhare MG et al among dental and medical undergraduate students in Beed District of Maharashtra.[13] This may be due to perception of halitosis is subjective and not objective.

A study in dental and medical students of Eastern India reported that majority of the medical students thought dental treatments are expensive,[14] these results are in accordance to the current study.

**Limitations:** The study was conducted in final year medical students in just one medical college and the results obtained cannot be applied to all the medical colleges. Larger sample size including different medical students in different medical colleges from different parts of India, should be carried out to generalise the statement.

**Recommendations:** The medical students should be educated about dental health, its maintenance and its implication on systemic health. Their behaviour and attitude can be modified by incorporating certain curriculum changes like, compulsory dental clinical postings during their undergraduate course.

Additionally, oral health check-up and dental consultation should be made mandatory during general

health check-up, so as to help all the patients in maintenance of good oral and general health.

## Conclusion

The result of this study indicates that the knowledge regarding dental problems among final year medical students was average, but the attitude of the medical students was negative in regards to certain questions. The medical education should stress upon dental problems and collaboration with dentist for treatment of dental problems for better health of the patients.

**Conflict of Interest –** Nil

**Source of Funding-** Nil

**Ethical Clearance –** Ethical clearance was obtained from Krishna Institute of Medical sciences Deemed to be University (KIMSDU), Ethical clearance letter number: KIMSDU/IEC/09/2016.

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**Type of Article- Original Research Article.**

# Consensual Sexual Intercourse among children Vs Current Legal Provisions under POCSO: A Scientific Review with Prospective Quantitative Analytical Study

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## Abstract

**Background:** Prevention of Children from Sexual Offences (POCSO) act criminalizes all acts of sexual intercourse and does not differentiate acts of consensual sexual intercourse from provisions of the said act. **Aim:** To find incidence and demography of victims and accused in cases of consensual sexual intercourse registered as cases of alleged sexual assault under POCSO **Material and Method:** Current study was conducted at B J Government Medical College Pune on alleged cases of sexual assault brought for examination during November 2015 to September 2017, with cases of female child with history of consensual sexual intercourse being the inclusion criteria. **Result:** A total of 174 (32.58%) cases of consensual sexual intercourse was examined with the majority being from the age group of 16-17 years (36.78%). Out of 174 cases, 24 were pregnant. In all only 02 were completely illiterate. Among accused majority were from the age group of 22-24 years (40.23%). **Conclusion:** Consensual sexual intercourse among children is known and different entity and should be treated separately from the purview of POCSO, but should also maintain the letter and spirit of the law.

***Keywords:*** *Consensual sexual intercourse, POCSO, child autonomy, teenage pregnancy.*

## Introduction

Historically, child sexual abuse (CSA) has been a hidden problem in India, largely ignored in public discourse and by the criminal justice system. However, the movement, spearheaded by Ministry of Women and Child development, led to the enactment of new legislation called the protection of Children from Sexual Offences (POCSO).[1]

Under POCSO act, the numbers of CSA cases registered for the year 2014 were 8904 which rose to 14,913 in year 2015.[2] In a shocking revelation, a government-commissioned survey in the year 2005 has found that more than 53 percent of Indian children are subjected to sexual assault, i.e. 4 out of every 10 persons.[3] A recent report on the census data of 2011 indicated that in India one in six women were married before they were 18 years of age, of which 17.5% (6.5 million) women had been married within four years before when the census was conducted.[4] Thus there are possibly 6.5 million (and growing) potential lawsuits, under POCSO. But, all sexual acts described under POCSO, are without exception, considered to be criminal offences if they involve, a 'victim' under the age of 18 years. Adolescence years are the age of exploration and development. In this stage, children develop sexually. Considering all sexual activity, even if they are done with consent, under POCSO they are considered a crime.[1]

Article 12 of United Nations Convention on the Rights of Child (UNCRC) states: "States Parties shall assure to the child who is capable of forming his or her views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of child."[5] Thus consensual sexual intercourse of a child becomes a controversial issue for implementation of the POCSO act.[1]

Hence present prospective study is conducted to highlight this issue quantitatively, to find the incidence of such cases of consensual sexual intercourse in children and its burden on the existing legal system.

## Material and Method

The present study is a prospective, quantitative, analytical study conducted at B J Government Medical College and Sassoon General Hospitals, Pune from November 2015 to September 2017 after obtaining permission from the institutional ethical committee. All female child cases, victims of alleged sexual assault brought for medical examination of age less than 18 years, who had given the history of voluntary sexual intercourse, were included in the study after obtaining the appropriate and valid consent. All other cases were excluded.

After taking a detailed history from victims and on perusal of supportive documents submitted by investigating authorities, relevant information about consent for sexual intercourse, age of menarche, pregnancy, and educational status were recorded in predesigned proforma. This information was then statistically analyzed using Microsoft excels software and presented in the form of diagrams and tables.

## Observation and Result

During the study period total, 948 victims of alleged sexual assault were brought for medical examination. Out of these 571 (60.23%) were of age less than 18 years and 534 (56.23%) had given consent for examination. Out of this, 174 (32.58%) cases were included in the present study as per the inclusion criteria. (Diagram 1)

When details of consent given for sexual intercourse were taken into consideration the total 174 (32.58%) victims mentioned the history of voluntary and consensual sexual intercourse. The majority of them were of age group 16-17(36.78%) followed by 17-18(29.31%). The minimum age of menarche was 11 years and the maximum is 16 years with the average age of menarche as 12.7 years. In all 170 cases (97.70%) were falling within the age group of 13-18 years. (Table1)

Out of 174 cases, 24 cases (13.80%) became pregnant. Amongst these pregnant females majority were from age group 16 -17 years (41.67%) followed by 17-18 years (29.16%) with percentage within 13-18 years age group as 100 percent. (Table 2)

Considering educational status 127 (72.99%) were still studying with the majority being in secondary school (77.95%) and 45 (25.86%) had left education with the majority during secondary schooling (80%); while only 02 (1.15%) were illiterate and never went to any educational institution. (Table 3)

Demography of the accused in these cases showed that the majority were from the age group of 22-24 years (40.23%) followed by 25-27 years (21.84%) and 19-21 years (20.11%). In all total 110 (63.22%) individuals were falling within the age group of 16-24 years. (Table4).

**Diagram 1: Diagram showing distribution of cases under various sections.**

**Table 1: Age-wise distribution of cases of the victim who had voluntary sex**

| Sr. No | Age of victim who had voluntary sex | Number | Percentage ( n= 174) |
|---|---|---|---|
| 01 | 12 - <13 | 04 | 02.29 |
| 02 | 13 - <14 | 02 | 01.15 |
| 03 | 14 - <15 | 15 | 08.62 |
| 04 | 15 - <16 | 38 | 21.84 |
| 05 | 16 - <17 | 64 | 36.78 |
| 06 | 17 - <18 | 51 | 29.31 |
| | Min age of menarche -11 years and the maximum is 16 years with mean as 12.7 | | |
| 08 | 13 to < 18 | 170 | 97.70 |

**Table 2: Age-wise distribution of cases of the victim who had voluntary sex and became pregnant.**

| Sr. No | Age of victim who had voluntary sex and became pregnant | Number | Percentage ( n= 24) |
|---|---|---|---|
| 01 | 12 - <13 | 00 | 00 |
| 02 | 13 - <14 | 00 | 00 |
| 03 | 14 - <15 | 04 | 16.67 |
| 04 | 15 - <16 | 03 | 12.50 |
| 05 | 16 - <17 | 10 | 41.67 |
| 06 | 17 - <18 | 07 | 29.16 |
| 07 | 13 to <18 | 24 | 100 |

**Table 3: Distribution of cases of the victim who had voluntary sex according to education**

| Sr. No | Education status of the victim | | Number | Percentage ( n= 174) | |
|---|---|---|---|---|---|
| 01 | Illiterate | | 02 | 1.15 | |
| 02 | Studying | | 127 | 72.99 | |
| | **A** | Primary Studying | 01 | 0.79 | For these values n=127 |
| | B | Middle Studying | 05 | 3.94 | |
| | **C** | Secondary Studying | 99 | 77.95 | |
| | **D** | Higher secondary studying | 20 | 15.75 | |
| | **E** | Degree studying | 02 | 1.57 | |
| **03** | Left studying | | 45 | 25.86 | |
| | **A** | Primary left | 00 | 00 | For these values n=45 |
| | **B** | Middle left | 03 | 6.67 | |
| | **C** | Secondary left | 36 | 80 | |
| | **D** | Higher secondary left | 05 | 11.11 | |
| | **E** | Degree left | 01 | 2.22 | |

**Table 4: Age-wise distribution of accused.**

| Sr. No | Age of accused | Number | Percentage ( n= 174) |
|---|---|---|---|
| **01** | 16-18 | 05 | 2.87 |
| **02** | 19-21 | 35 | 20.11 |
| **03** | 22-24 | 70 | 40.23 |
| **04** | 25-27 | 38 | 21.84 |
| **05** | **28-30** | 23 | 13.22 |
| **06** | **31-33** | 03 | 1.72 |
| **07** | 16-24 | 110 | 63.22 |
| **08** | 25-32 | 64 | 36.78 |

**Table 5: Age of consent for sexual intercourse in different countries.**

| Sr. No | Name of country | Age of Consent for Sexual Intercourse |
|---|---|---|
| 01 | USA- Northern America | 16 years |
| 02 | UK | 16 years |
| 03 | Germany | 14 years |
| 04 | France | 15 years |
| 05 | India | 18 years |
| 06 | Bangladesh | 14 years |
| 07 | Nepal | 16 years |
| 08 | Japan | 13 years |
| 09 | Israel | 16 years |
| 10 | Indonesia | 16 years |
| 11 | China | 14 years |
| 12 | Canada | 16 years |
| 13 | Brazil | 14 years |
| 14 | Singapore | 16 years |
| 15 | Srilanka | 16 years |

## Discussion

The current study cannot be compared directly, in a quantitative fashion, to other studies done on the subject of Child sexual abuse, as, to the best of our knowledge none of the previous studies have elaborated data regarding cases of consensual sexual intercourse in children.

From the present study, it is very much clear that 32.58% of cases fall within the category of consensual sexual intercourse and are cases in conflict with provisions of POCSO, and are probably a burden on the legal system as well as on medical profession. Here we wish to quote a case reported by Sujata Aryakar and Aarathi Chandrashekhar, where 15 year old girl willingly eloped with and married a 22 year old man.[6] In the same case, the Special court judge rejected the notion that the human body of a person under 18 years is the property of the state, whereby it can restrict individual autonomy. While ruling, the judge held that criminalizing such behavior would not serve the purpose of the enactment.[1] On the other hand, Arya and Chaturvedi pointed out that criminalizing sex below 18 years will prevent the school counselors and doctors to provide safe sex advice or treat the effects of unsafe sexual practice.[7]

Considering the demography of the accused in the present study, it is worth mentioning that the age group 22-24 years was most involved and affected followed by age groups of 25-27 years and 19-21 years. Shocking 63.22% of individuals were falling within the age group of 16-24 years. This again highlights the issue of the working adult healthy population of the state being victimized of legal provisions of POCSO.

Considering the literacy 72.99 % of affected girls were still studying while 25.86% had left education. The majority of the population among both groups was from the secondary standards of the school. As adolescent sex education being given primarily for age groups of 10-19 years in India, [8] current study raises doubt on standards and contents of sex education being imparted to these children.

The incidence of pregnancy among these girls was 13.80%, with the majority were from age group 16 -17 years (41.67%) followed by 17-18 years (29.16%), incorporating 100% within 13 to 18 years of age. Complications arising from pregnancy and unsafe abortions are a leading cause of death among women aged 15-19 years, with 20% of the group experiencing child before 17 years of age, with pregnancies often closely spaced.[9] This now raises the issue of awareness about outcomes of teenage pregnancy in these age groups and again questions the methodologies adapted to educate these girls under sex education.

Madras High Court in a present ruling in June 2018 stated, " Any consensual sex after the age of sixteen or bodily contact or alleged acts could be excluded from the rigorous provisions of POCSO act and sexual assault could be tried under more liberal provisions which can be introduced in the act, differentiating sexual assault and teenage relationship." Judge further observed, " In cases where age of girl is below 18 years, even though she is capable of giving consent, being mentally matured, unfortunately, the provisions of POCSO act get attracted, if such a relationship transcends beyond platonic limits, catching up with the so called offender of sexual assault, warranting a severe imprisonment of seven/ten years."[10]

This thus raises the question of criteria evolved for determination of the age of consent for sexual intercourse. We could not find any scientific guidelines on which maturity of a girl can be decided concerning the age at which she can give consent for sexual intercourse. Secondly raising the age of consent for sexual intercourse from 16 years to 18 years does not seem to depend on any scientific measures but it merely seems to be the result of public outcry and political pressure.[11] Surprisingly different countries have different ages for the consent of sexual intercourse. (Table 5)[12]

The letter and spirit of law, which defines a child as anyone less than 18 years of age, is to protect children from sexual abuse, but at the same time, there is need of amendment in POCSO concerning cases of consensual sexual intercourse, again to protect these tender aged adolescent lovers and to respect child autonomy. There is also a need to change or to vigilantly monitor, contents, methodology and standards of sex education in adolescents. On the other hand, scientific principles should be laid down simultaneously, to determine the appropriate age of consent for sexual intercourse considering physical, social, sexual, and psychological

parameters.

## Conclusion

Cases of consensual sexual intercourse in the present study accounted 32.58% of the population with the majority from age group of 16-17 years (36.78%), while majority of accused falling within age group of 22-24 years (40.23%), elaborating need to understand and differentiate consensual sexual intercourse of child from provisions of POCSO.

**Conflict of Interest:** Not any

**Source of funding:** Not any

**Ethical Clearance:** Obtained.

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# Assessment of the Psychological Wellbeing of Elderly Residing at Pooncheri Rural Community Area in Kancheepuram District, Tamilnadu, India

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## Abstract

A descriptive Study on Assessment of the psychological wellbeing residing in pooncheri rural community area in kancheepuram (dist.), Tamil Nadu India. The objectives are to assess psychological wellbeing of elderly people. To find out the association between levels of psychological wellbeing of elderly people and selected demographic variables of elderly people. The sampling technique was non-probability, purposive sampling technique with 111 samples of elderly people and WHO standardized psychological wellbeing scale were used to assess psychological wellbeing of elderly. The demographic variables Performa, were used to collect data. The data collection tools were validated and reliability was established. The data collection for the main study was done. The collected data was tabulated and analyzed, using descriptive and inferential statistics. Majority of elderly 71.2% had adequate, 28.8% had moderate wellbeing, There no poor wellbeing. The psychological wellbeing mean value is57.34.

***Key Words**: Elderly, Wellbeing, rural community area, psychological wellbeing scale .*

## Introduction

Aging is an unavoidable developmental phenomenon bringing along several changes in the physical, psychological, hormonal and social conditions. Age has been viewed, as a problematic period of one's life and this is correct to some extent. Aged become increasingly dependent on others. As a man grows, his reduced activities, income and consequent decline in the position of the family and society make his life more vulnerable. (1)

The population expectation made by the UNESCO indicates that the percentage of the aged above 60 are likely to go up from 7.1 percent in 1991 to 12.3 percent in 2025 in India alone. Therefore, need to be paid proper observation to the quality of life of older persons. In almost all the countries of the world, elderly women be more numerous than elderly men. Rapid aging trends present new provocation to the government, families and the elderly themselves.(2)

The difficulty of elderly females has become a social problem in Indian society. The changes in the demographic structure during the last few decades in developing countries have made the aged socially more noticeable section. Moreover, modern society has faced a vast modification due to breaking up of the joint family system, technological upraising and attitude of the younger age group towards old age. All these have move on to the problems of the elderly, particularly women. The economic insufficiency of the nuclear family is resulting in the neglect of its members. The traditional roles are slowly being replaced with unimportant roles after retirement. (3)

The problems consummate by elderly are more acute, who are economically dependent solely on the families. In the advancing age, when the aged loose friends, power influence, job status, income, health, etc. bring a host of problems connected to physical, economic, social and psychological aspects. The elderly is a essential phase where the physiological, psychological and socio-cultural changes in the elderly present to developing anxiety.(4)

Modernization and globalization have disintegrated the Indian family system and elders are forced to stay in old age homes. In some cases, elderly members of relatively rich families or aged persons who have nobody to look after takes shelter in old age homes. The elderly lives in these homes merely in terms of existence to complete the last phase of the lives. (5)

Elderly is generally the chronological age, a universal phenomenon and a challenge to everyone, who reaches it irrespective of occupation, skill or learning. The world is rapidly aging: the number of people aged 60 and over as segment of the universal population will double from 11% in 2006 to 22% by 2050. As per the WHO recommendation people 60-74 years of age are called elderly and those between 75 and 85+years of age as old. By then, there will be older people than children (aged 0-14) in the population for the first time in human history. (6)

## Objectives

· To assess the Psychological wellbeing of elderly.

· To find out the association between psychological wellbeing of elderly with the selected demographic variables.

**Hypothesis:**

· **H1:** There was significant level of Psychological wellbeing among Elderly.

· **H 2:** There was significant association between Psychological wellbeing with their selected demographic variable.

## Research Methodology

In this study Quantitative research approach and, Descriptive research design adopted. Non-experimental descriptive research design was used for the present study. Standardized WHO Psychological wellbeing scale was used to assess the psychological wellbeing of elderly and Structured questionnaire to assess demographic variables of Elderly Peoples residing in a selected rural community area who fulfills the given criteria were selected as a sample.

**Sampling Criteria:**

**A. Inclusion Criteria**

The inclusion criteria were as follows:

· Elderly sample who living in a selected community area.

· Elderly with the age group 60 years and above

**B. Exclusion Criteria**

The exclusion criteria as follows:

· Elderly who are having mental illness.

· Elderly who are not willing to participate.

**Method of Data Collection:**

In this present study the researcher distributed questionnaires to the samples. The samples were instructed to fill the data. Each sample took 30 min for completion of their data. Data collected over a period of one week(from 22-4-2018 to 27-4-2018).The convient sampling technique adopted. The data was collected in pooncheri village, kanchepuram district tamilnadu, India the total sample is 111. Among the total samples 51 were male and 60 were female.

**Research Tool:**

There are Two sections (A&B) in Research tool, in Section A consist of Self structured questionnaire consists of 9 questions to asses demographic variables& Section B consist of WHO psychological wellbeing scale consist of 18 items and consists of serious of statements reflecting the six areas of psychological wellbeing autonomy, environment, mastery, personal growth, positive relation with others, purpose in life and acceptance.

| **SCORING & INTERPRETATION:** | |
|---|---|
| **SCORE** | **LEVEL OF WELLBEING** |
| 61-90% | Adequate knowledge |
| 31-60% | Moderate knowledge |
| 18-30% | Poor knowledge |

## Data Collection Procedure:

The written informed consent was obtained from the research participants. Permission letter was obtained from the HOD of Mental Health Nursing, UG committee and Human Ethical committee.

Formal permission obtained from the management and the department of community medicine.

Descriptive statistics like frequency distribution, percentage, mean, standard deviation & inferential statistics like chi square used to analyse the data.

Collected data tabulated and analysed.

**Frequency and percentage distribution of Psychological wellbeing of elderly**

| S.NO | Level of Wellbeing | Frequency | Percentage |
|---|---|---|---|
| 1 | Adequate | 79 | 71% |
| 2 | Moderate | 32 | 29% |
| 3 | Poor | 0 | 0% |

**(N=111)**

## Result

The study findings revealed that,

Ø In previous study on assessment of Psychological wellbeing result shows that;

The study investigated the effect of intergeneration social support on the subjective well-being of 429 elderly participants. Results suggested that intergeneration social support, self-esteem, and loneliness were significantly correlated to subjective well-being. Structural equation modeling indicated that self-esteem and loneliness partially mediated the effect of intergeneration social support on subjective well-being. These findings provided insights into the effect of intergeneration social support on the subjective well-being of the elderly**,(Qian Tian Sep 9 , 2014)**

Relationship with children and the psychological well-being of the elderly Litha Almira, Lathifah Hanum, Adhityawarman Menaldi the study is results showed no correlation between the positive qualities of the relationship and psychological well-being ($r=0.092$, $p>0.01$). However, the negative qualities of the relationship were negatively correlated with psychological well-being ($r=-0.335$, $p<0.01$) This study employed convenience sampling and to reach 102 elderly participants.

**Our study** result reveals that in assessing the level of wellbeing showed that the mean score 57.34, mean % 64% and standard deviation 6.59 Psychological wellbeing of elderly. Maximum score for Psychological welleing were Adequete 79(71%), moderate32(29%).

Distribution of demographic characteristics of elderly said that the majority elderly was in the age group of 60-65 years 50(45%), most of elderly was female 60 (54%), majority of elderly got the primary education 51(46%), most of the elderly people previous occupational status was daily wage workers 44(40%), majority of the elderly was Hindus 94(85%). The language spoken by the elderly was Tamil 108(97%), they are living in the nuclear family93(108%), majority of the people having own house85(77%) and the less number of elderly getting pension21(19%).

## Discussion

Psychological wellbeing and the association factor in our study shows that:

The findings of the study revealed that there showed that there is significant association between the demographic variable (P=< 0.005)and the gender and language, there is no significant association between

demographic variables and psychological wellbeing among elderly in age, education, previous occupational status, religion, family, type of house and are they getting any pension.

## Conclusion

On the basis of research, we concluded the Psychological wellbeing is majority of the elderly is have adequate wellbeing and minority of elderly having moderate wellbeing.

**Source of Funding:** By self-funding there no external source

**Conflict of Interest-** Nil

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# Effectiveness of Flax Seed Pillow on Stress and Physical Parameters of Premature Infants

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## Abstract

**Introduction :** As per WHO report in 2018, every year, 15 million babies are born prematurely, the leading cause of child deaths under age five every year. Many survivors of preterm birth face a lifetime of disability, including learning disabilities and visual and hearing problems.

**Purpose of the study:** To find the effectiveness of a flaxseed pillow on stress and physical parameters in premature infants.

**Methodology :** An evaluative two group pretest post-test approach selected for the study. Premature infants selected by a purposive sampling technique and applied with a flaxseed pillow. All the infants were observed two times per day for five consecutive days from the day of recruitment. Stress and Physical parameters obtained and analyzed to find the effectiveness of the intervention.

**Results:** Out of 34 Premature infants, 17 (50%) underwent flax seed pillow treatment, and remaining were the control group. Independent sample t-test results showed that there is a significant difference (pre-post) in the stress score between the experimental and control group. The paired t-test result revealed that there is a difference ($p< 0.05$) in the stress score among the experimental groups for all five days.

**Conclusion:** An increasing number of premature birth is one of the most significant issues faced by the country today. Many developmental care interventions provided to preterm babies, which are cost-effective care and help these vulnerable in their phase of prematurity. Flaxseed pillow was effective in reducing the stress of premature infants in the NICU.

***Keywords:*** *Intensive Care Units, Neonatal, Low Birth Weight, Infant, Premature, Flax, Seeds*

## Introduction

A premature baby is one born before 37 completed weeks of gestation. Prematurity refers to the inability of the infant who is born before the usual gestational period to adapt to extrauterine existence in comparison to the survival rate in mature infants. Prematurity usually carries a high rate of morbidity and mortality unless optimal care is given to maintain life. Prematurely born infants face multiple challenges and obstacles on their path to continued growth and development, and they struggle to adapt to the unnatural environment of the Neonatal Intensive Care Unit (NICU). Some challenges are directly related to differences between the environment of the uterus and in the NICU. The unexpected stressors from various stimuli, individually or in combination, can cause pain and lead to fatigue. In this hostile environment, the premature infant is forced to use more of limited resources to cope with the environment rather than to grow and develop.

Prematurity is a stage where infants find it difficult to adapt to the external noxious environment of the tertiary care unit, where they are exposed to continuous stressors of the external world. Premature infants experience an environment that is rife with a negative touch. These stressors got a detrimental effect on the growth of the

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premature infant since these infants have difficulty in adapting to life outside the uterus as a result of immature body systems.

Developmental care is an approach that uses a range of medical and nursing interventions that aim to decrease the stress of premature infants in NICU. The developmentally appropriate care for the premature neonate enables the growth and development to its maximum.[1]

Researchers studied the effects of neuro developmental sensory stimulations and they documented weight gain and early discharge, as a result of these sensory enhancement interventions.[2]

As a result of the literature investigations, the researcher recognized that an opportunity existed to explore the effectiveness of a new, inexpensive, low technology developmental intervention that is a flaxseed pillow. Application of flax seed pillow reduces the stressors and improves the stability of premature infants, which helps in the effective utilization of resources for growth and development, resulting in weight gain. Flaxseed pillow uses natural, tiny, flat, smooth seeds that give the pillow the flexibility to form to any shape. Because of the seed's oil content, the pillows keep the heat or cold for up to 2 hours. When heated and applied to the body Flax Seed Pillows release a comforting, moist heat. These are very beneficial in soothing sore and tight muscles, Produce a calming effect and help curb insomnia, Act as warming pads - they heat cold hands and feet. It also helps poor circulation & calms the mind. Flaxseed pillow refers to a pillow that is filled with flax seeds used under the scapula of babies in order to rejuvenate the body by providing continuous warmth and a massaging effect when the seeds slide over one another during the body movements.

The study aims to assess the effect of a flaxseed pillow on stress and physical parameters in premature infants.

## Method

An evaluative approach with the Pre-test Post-test control group design, which is quasi-experimental, was adopted. The research proposal was placed in the Institutional ethics committee and obtained permission. (NUINS/CON/NU/IEC/ 2014-15 dated 26/09/2014). In this study, Premature infants who are medically stable, born between the gestational age of 32 to 36 weeks, who does not require any other support, except warmer, IV fluids or/and full enteral feedings were included. Premature infants who are falling above 90th percentile & below the 10th percentile in the growth chart require surgery or respiratory support, and any genetic anomalies and congenital malformations infants excluded from this study.

**Data collection tools**

The data was collected by demographic proforma for mother and premature infants, Premature infant stress behavior assessed by observation checklist, and weight

a) Demographic Proforma for premature infants comprised of Gestational age, Gender, Order of birth, Birth weight, the weight of the baby for five consecutive days, Time of discharge, and duration of hospital stay.

Demographic Proforma for mother includes age, type of delivery, indication for preterm delivery, medical conditions present during the antenatal period, administration of any medications during the antenatal period.

b) Premature infant stress behavior observation checklist used to assess the level of stress. The observation checklist for the study developed based on a theory called the Synactive theory of infant development, which is proposed by Dr. Als. The disorganized behavior of the premature infants in various subsystems (autonomic/ physiological, motor behaviors, state behaviors, self-regulatory behaviors) of the Synactive theory of newborn behavioral organization and development. It includes motor changes like,(flexion of arms and legs, arms salute etc), autonomic changes (color changes, breathing and heart rate variations etc), states behavior (gaze averting, staring, etc), and self-regulatory behavior (change in position, grasping, sucking).[3]

The observation checklist consists of 18 parameters under these subsystems, which describes a premature infant "s behavior in NICU, classified into organized and disorganized behavior. The score indicates the stress of premature infants. The maximum score is 18, and the minimum score is 1. Nine subject experts of nursing tested the content validity and relevance of the checklist. The reliability items in the tool were summed up and the total stress score of the day obtained. Then the intraclass correlation the coefficient was calculated, which was 0.715, and the p-value is 0.009, which weighs the reliability of the tool 0.85.

c) Calibrated infant weighing machine used to measure weight (kilogram).

**Data Collection Process**

In the NICU, the premature infants born between the age group of 32-36 weeks of gestation were selected by purposive sampling. The purpose of the study explained to the parents, and confidentiality was assured and informed written consent taken. Demographic Proforma was filled initially after that each premature infant was observed for 1 hour, and pretesting is done by filling the observation checklist by the researcher. The premature infants divided into two groups, experimental and control group consisting of 17 subjects each. After the pretesting, the experimental group received 30 minutes of flax seed pillow treatment, whereas the control group did not receive it. The flaxseed pillow is kept over the upper back of the babies( over the scapula). After the treatment for the experimental group, both the groups were subjected to a post-test for 1-hour observation with an observation checklist. The experimental group received five consecutive days of treatment with a flaxseed pillow and control group without a pillow. Each subject was weighed all the five days and the weight on the discharge day, and the duration of hospital stay also recorded

## Data Analysis

The collected information summarized by using descriptive statistics. ( Frequency, Percentage, Mean & Standard deviation) .

The effectiveness of flaxseed pillow on stress and physical parameters assessed by using Paired "t" test.

Chi-square & Fisher "s exact test used to find the association between the selected demographic variables with physical parameters and stress.

The difference in duration of hospital stay, physical parameters, and stress between the subject with flax seed pillow treatment and without treatment compared by using independent "t" tests. The level of significance for this study is 5%.

## Results

**Description of sample characteristics**

About 18(52.9%) of premature babies are males, and female babies are 16 (47.1%). Most of the premature babies 24(70.6%) belong to the gestational age group of 32-34 weeks, and only 10 (29.4) among 34 premature infant belongs to 34-36 weeks of gestation. Among 34 premature infants, 15(44.1%) were second-born, 10(29.4%) were firstborn, 7(20.6%), and 2(5.9%) were third and fourth born, respectively.

About 15 (44.1%) of the mothers of preterm infants are in between the age group of 25-29 followed by 13 (38.2%) are in 20-24, 3(8.8%) are in <20, 2 (5.9%) of them in 30 to 34 and only 1 person (2.9%) in 35-40 years. Around half of the deliveries were normal 18 (52.9%), others were LSCS 10(29.4%), Vacuum 4(11.8%), and only 2 (5.9%) were forceps delivery. Premature rupture of the membrane was the most common cause for preterm delivery 8(23.5%); the second cause is fetal distress, which constituted 6(17.6%). Placental abnormalities 4(11.8%) and pre-eclampsia 4(11.8%) were the third common cause, which is followed by multiple pregnancies 3(8.8%). Two of the common diseases present during the antenatal period were Hypertension 8(23.5%) and Gestational Diabetes mellitus 7(20.6%). Mothers with other diseases like Oligohydramnios, Polyhydramnios, and Cardiac conditions constituted about 3(8.8%), 4(11.8%), and 3(8.8%), respectively. Among 34 mothers, 8 (23.5%) of them were on regular medication for medical conditions.

**Table:- 1 The effectiveness of the flaxseed pillow on stress and physical parameters within the groups by using the Paired "t" test. n = 34**

| Within Group comparison | Day | Mean difference | t value | P value |
|---|---|---|---|---|
| Experimental group | Day 1 | 2.03 | 4.81 | <0.001* |
| | Day 2 | 2.85 | 7.45 | <0.001* |
| | Day 3 | 2.00 | 4.57 | <0.001* |
| | Day 4 | 1.76 | 3.95 | <0.001* |
| | Day 5 | 1.47 | 4.92 | <0.001* |

***Cont ...*** **Table:- 1 The effectiveness of the flaxseed pillow on stress and physical parameters within the groups by using the Paired "t" test.**

| | | | | |
|---|---|---|---|---|
| Control group | Day 1 | 0.35 | 0.98 | 0.339 |
| | Day 2 | 0.02 | 0.08 | 0.935 |
| | Day 3 | 0.82 | 2.69 | 0.016* |
| | Day 4 | 1.00 | 3.51 | 0.003* |
| | Day 5 | 0.38 | 1.04 | 0.311 |

(* significant)

It is evident that the calculated t values are more than the table value on all the five consecutive days of the experimental group and the p values are < 0.001 on all the five days. It indicates that a flaxseed pillow is effective in reducing the level of stress among premature infants at a 5 % level of significance.

**Table 2:- The difference in the level of stress between the experimental and control group in each day respective of the intervention. (Independent sample t-test)** n = 34

| **Day** | | **Mean difference between the experimental and control group** | **t value** | **P-value** |
|---|---|---|---|---|
| Day 1 | Pre | 1.08 | 1.69 | 0.105 |
| | Post | 2.76 | 4.81 | < 0.001* |
| Day 2 | Pre | 0.61 | 1.00 | 0.322 |
| | Post | 3.44 | 6.02 | < 0.001* |
| Day 3 | Pre | 1.55 | 3.58 | < 0.001* |
| | Post | 2.73 | 5.17 | < 0.001* |
| Day 4 | Pre | 1.52 | 3.63 | < 0.001* |
| | Post | 2.29 | 4.21 | < 0.001* |
| Day 5 | Pre | 2.11 | 4.16 | < 0.001* |
| | Post | 2.11 | 4.16 | < 0.001* |

The data presented in table 2, shows that except the baseline measurements of day 1 (t = 1.69) and day 2 (t = 1) calculated values are more than the table value 2.04, also the p values are < 0.05. Hence there is a difference in stress level between experiment and control group at a five percent level of significance except day 1 and day 2. Hence

the null hypothesis (H01) for stress is rejected, and the research hypothesis (H1) for stress is accepted.

## Discussion

The findings of the present study show that premature rupture of the membrane was the common cause for preterm delivery 8(23.5%); the second cause is fetal distress, which constituted 17.6%. Placental abnormalities 4(11.8%) and pre-eclampsia 4(11.8%) were the third common cause, which is followed by multiple pregnancies 3(8.8%).The finding is supported by the study conducted on Epidemiology of preterm premature rupture of fetal membranes (PPROM) at the University Teaching Hospital, Lusaka which shows premature rupture of the membrane is the common cause of preterm births. [4]

Similar findings can be seen in various studies which showed that PROM is associated with 30-40% of preterm deliveries and is the identifiable leading cause of preterm delivery.

The present study showed that 29 (85.29%) mothers of premature infants among 34, had medical illness during the antenatal period like Gestational Diabetes Mellitus 7 (20.6%), Hypertension 8 (23.5%), Oligohydramnios and cardiac conditions 3 each (8.8%), Polyhydramnios 4 (11.8%) and other conditions 4 (11.8%) respectively. The present study also shows that two of the common diseases present during the antenatal period were hypertension 8(23.5%) and Gestational Diabetes mellitus 7(20.6%).

The present study is supported by the study findings on hypertension which showed that hypertension is the most common medical disorder of pregnancy and is reported to complicate up to 1 in 10 gestations and affects an estimated 2,40,000 women in the United States every year.

Findings of a study done in Western Australia on antenatal risk factors also support that hypertension (13.3%) and gestational diabetes (8.2%) are the two common diseases that exert risks on the antenatal period. This finding reveals that whenever a mother is in the high-risk pregnancy, she is most likely to deliver a premature infant.[5]

In the present study, results showed that in the experimental group the mean score of stress before keeping flax seed pillow was higher compared to the score after the treatment with a flaxseed pillow for the five consecutive days. This study is consistent with the findings where the flaxseed pillow is used as a new developmental approach.

This study is supported based on the efficacy of another study on the soothability of preterm infants, which is done in the US, where the preterm infants are soothed after the treatment with a flaxseed pillow.[6]

This study does not show any statistical differences in weight gain and duration of hospital stay between experimental and control group. This may be due to the small sample size and duration of flax seed application. Even though there is no marked difference, still the treatment could establish one day difference in duration of hospital stay and 0.4 g of weight difference between the experimental and control group.

Similar result found in a study where, Infants in the treatment group also gained more weight in the first 3 weeks of life and spent more time awake. Discharge weights and length of stay at hospital did not vary between the two groups.[7]

From the above findings, the researchers felt that developmental care techniques like massage and tactile stimulation had got a beneficial effect on stress behaviors. It is also evident that flaxseed pillow, which is a similar developmental care measure like massage and tactile stimulation, has got a stress-reducing effect on the hospitalized premature infants because flaxseed pillow provides a similar tactile stimulation as that of massage on the body of premature infants when the infant is placed over the pillow.

The limitations of this study were data collected from only one NICU, the researchers recruited only AGA babies and the study assessed only a few parameters of the subsystems of the Synactive theory of newborn behavior and development.

The implications of the study are nurses working in NICU should be able to recognize the stress cues or stress responses of the preterm babies to decrease the duration of hospital stay, and the nurses are responsible for providing education to parents of preterm infants regarding their management at home, inculcating the developmental care measures.

## Conclusion

An increasing number of premature birth is one

of the most significant issues faced by the country today. To help these vulnerable people in their phase of prematurity nursing profession has come with many developmental care interventions were preterm babies are provided the best possible cost-effective care to fight against their prematurity. Flaxseed pillow was effective in reducing the stress of premature infants in the NICU. Such research studies should be encouraged and continued so that the neonatal nurse and caregivers are made aware of the developmental care for premature infants for complete growth and development.

**Ethical Clearance**- Taken from the Institutional ethics committee. (NUINS/CON/NU/IEC/ 2014-15 dated 26/09/2014).

**Conflict of Interest –** Nil

**Source of Funding -** Self

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*Research Article*

# A Study to Examine the Association of Health Related Behaviours and Body Mass Index among Young Adults at Selected Colleges in Kancheepuram District, Tamil Nadu, India

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## Abstract

A observational study to examine the association of Health related behaviours and Body mass index among young adults at selected colleges in Kanchipuram District, Tamil Nadu, India''. The objectives were to examine the lifestyle practices and Body mass index among young adults at Kanchipuram district, Tamil Nadu and to find out the association between lifestyle practices and BMI with demographic variables. The convenience sampling was used to select 100 young adults. The data collection tools were validated and reliability was established. The data were collected by self-administered questionnaire. The collected data was Tabulated and Analyzed. Descriptive and Inferential statistical methods were used. The study shows that of the higher frequency of 18-24 years (96%) and lower frequency of 20-24 years (4%). In Gender, Male is lowest frequency (28%) and Female is the highest frequency (72%). There was significant association between the knowledge and the selected demographic variables.

***Keywords*** *:Health related behaviour, Body mass index, Young Adults.*

## Introduction

Majority of Indian population lives in rural areas mainly depending on agriculture for their livelihood and carry out more physical activities than urban population, who are accustomed to sedentary lifestyle1. Diet is a component of lifestyle, which plays an important role in the development or prevention of overweight and obesity.Young people brought up in rural areas lead a healthier life style compared to their peers in big cities[2]. Physical activities changed as a result of increased television watching, spending more time on computer or mobile and spending less time on outdoor sports.The dysregulation of energy consumption and expenditure related to inappropriate dietary habits and lack of exercise increases the prevalence of both overweight and obesity[3].

Young people form precious human resources in every country. However, there is considerable ambiguity in the definition of young people and terms like young, adolescents, adults, young adults are often used interchangeably. World Health Organization (WHO) defines 'adolescence' as age spanning 10 to 19 yr, "youth" as those in 15-24 yr age group and these two overlapping age groups as "young people" covering the age group of 10-24 yr4. Adults include a broader age range and all those in 20 to 64 yr5. Adolescence is further divided into early adolescence (11-14 yr), middle adolescence (15-17 yr), and late adolescence (18-21 yr)6. Individuals in the age group of 20 - 24 yr are also referred to as young adults7. The National Youth Policy of India (2003) defines the youth population as those in the age group of 15-35 yr8.

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Population aged 10-24 years accounts for 373 million (30.9%) of the 1,210 million of India's population with every third person belonging to this age group. Among them, 110 and 273 million live in urban and rural India, respectively. Males account for 195 million and females 178 million, respectively9. As per the National Sample Survey (NSS), (2007-08) 32.8 per cent of this group attend educational institutions and 46 per cent (2004-05) are employed[10].

Obesity can arise in early years due to irregularity in diet , lack of exercise and addiction.The young students who live away from home in hostels are more prone tohave unhealthy lifestyle. Unhealthy diet and physical Inactivity at younger ages are the two main risk factors that have been associated with raised blood pressure ,blood glucose , abnormal blood lipids , major chronic disease like ischemic heart disese , cancer , and diabetes. India is encountering a dual burden of under nutrition over nutrition due to monetary factors and education of the people of society. There are many factors which influence BMI among adolescents and young adults. Thus ,the present study was done to assess the Health behaviour and BMI among students of a Nursing college in Chennai.

## Resaerch Materials and Method

Research Approach:

A research approach is a frame work or guide used for the planning, implementation and analysis of the study . It also involves the plan to investigate the phenomenon under study.

Quantitative descriptive approach.

Research Design:

The research design is the master plan specifying the methods and procedures for collecting and analyzing the needed information in a research study.

A sample of 100 students was selected for the study by using convenient sampling method. The instruments used for data collection were structured questionnaire's to determine height, weight and BMI.

The investigator plan to collect the data for the period of one week. Prior permission and consent was obtained from the Hindu mission college of nursing.

Chi-square test was used to find out the association between demographic variables of health related behaviour and body mass index.

Research Setting:

A research setting is a physical social and cultural site in which the researcher conducts the study.

The present study was conducted at Hindu mission nursing college, Tamilnadu, India.

Population

Population is the aggregation of all units in which a researcher is interested in other words , Population is a set of people or entities to which the result of a research are to be generalised .

Data related to lifestyle practices and body mass index among young adolescents was obtained from Hindu mission college students .

The population of the study is college students.

Sample :

Sample is a representative unit of a target population , which is to be worked upon by the researchers during their study. In other words sample consists of subsets of units which comprise the population selected by the researcher to participate in the research project.

The sample are the students who are fulfilling the sampling criteria.

Sample Size : Sample size was 100. N-4pq/d.

Sample Techniques

Sampling Criteria:

A) Inclusion criteria.

The study include the college students including aged between 18-24 years.

§ Who are willing to participate in the study.

§ Who can understand Tamil and English language.

B) Exclusion criteria.

§ who are not willing to participate in the study. Those

§ Those who are absent on the day of data

collection.

SELECTING AND DEVELOPEMENT OF THE STUDY INSTRUMENT

SECTION A:Demographic Variables such as .

SECTION B:

PART a: Anthropometric Measurement (Height ,weight and BMI) with the help of the stadiometer and weighing scale.

PART b: Structured life style Questionnaire to assess the young adults health related behaviors.

Scoring Interpretation:

## Data Collection Method

Data collection was done after the approval of ethical committee. The investigator approached and got permission from principal college of nursing to collect the baseline data to Weight was recorded for each girl and boy with school uniform, with the each girl/boy standing erect without any support and without shoes using an electronic weighting scale to an accuracy of 0.1 Kg. Height was taken with the help of a stadiometer after removing the footwear with the subject standing erect and heel and occiput touching the upright rod to the nearest 0.5cm. Weight was measured to nearest 100gms. Using the weight and height, Body mass index (BMI) was calculated in Kg/m2, for each girl and boy using standardized CDC BMI chart for boys and girls. Based on age and sex specific BMI centiles, the children were classified as overweight (≥85th centile) and obese (≥95th centile) and non-overweight and non-obese (<85th centile) .Initial data was collected on demographic and clinical variables and then structured Lifestyle questionnaire was given to the group.

**Ethical Consideration:**

· Departmental clearance obtained from Department Of Medical Surgical Nursing, Chettinad college of Nursing.

· U .G committee clearance will be obtained from U.G committee.

· Institutional Ethical Committee clearance will be obtained from CARE.

· Formal permission will be obtained from the authority of the selected college Authority.

· Informed consent will be obtained from the study samples.

FINDINGS

The study findings are categorized as:

SECTION A : Describe the frequency and percentage of demographic variables

SECTION B: Association of demographic variables with the lifestyle practices and body mass index

SECTION C: Distribution of Correlation between the lifestyle practices and body mass index.

SECTION - A

Frequency Percentage of Demographic Variables In Lifestyle Practices And Bmi Among Young Adolescents

Majority of young adolescents were in age group of 96% in 18-20yrs and only 4% takes place in 21-23yrs.

· 7In Gender , female takes place of 72% more than males of 28% .

· Distribution of percentage in undergraduate students of each year is 24%in I year,34%in II year,36% in III, 6%in IV year.

· Residency of student in hostel is 41% and dayscholar is 59%.

· Source of information were available through Health professionals is 36%,Mass media is 40% and relatives/ friends is 24%. Dietary habits of non-vegetarian is 91% more than 9 % of vegetarian

SECTION B: Association of demographic variables with the lifestyle practices and body mass index

Describes that in age group 18-20years in underweight is 35% ,normal is 51% and overweight is 10%, in 21-23years underweight is 0%,normal is 3% and overweight is 1%.

· Distribution of gender in underweight for male is 15%,normal is 13%and overweight is 0% and for female in underweight is 20%,normal is 41% and overweight is 11%.

· Hostellers in underweight is 13%,normal is 23% and overweight is 5% and dayscholars in underweight is

22%,normal is 31% and overweight is 6%.

· Dietary habits of adolescents to vegetarian in underweight is 3%,normal is 4%and overweight is 2% and in non-vegetarian in underweight is 32%,normalis 50%and overweight is 9%.

**SECTION - C**

**TABLE 1- Correlation between lifestyle practices and Body mass index .**

| VARIABLES | MEAN | STANDARD DEVIATION | CORRELATION (r2) |
|---|---|---|---|
| Practice | 5687 | 56.87 | O.O2 |
| BMI | 2018.7 | 20.187 | |

TABLE 1 shows that there is a statistically mild positive correlation occurs between the lifestyle practices and body mass index.

## Conclusion

All health behaviours exhibited independent associations with lifestyle practices and body mass index. Frequent consumption of vegetables and fruits, breakfast and dinner with family and regular physical activity were positively associated with good levels of lifestyle practices and BMI , while frequent consumption of junk food , not meeting sleep recommendations, and overweight and obesity were negatively associated lifestyle practices and BMI achievement.

**Conflict of Interest :** Nil

**Source of Funding :** Self

**Ethical Clearance :** Chettinad academy of research and education, institutional human ethics committee on 4/02/2019 ( Proposal No :328/IHEC/1-19)

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# Five Year Retrospective Study of Profile of Burn Deaths from Pune Region

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## Abstract

A burn is an injury which is caused by application of heat or chemical substances to the external or internal surfaces of the body, which causes destruction of the tissues. The magnitude of deaths due to burns is so large in our country that India is the only country in the world where fire is classified among the fifteen leading causes of death. The purpose of this study is to analyze profile of burn deaths in the Pune region of Maharashtra. In the present study among the 1710 burn deaths, females (70%) are more commonly affected than males (30%). Young adults (21–40 yrs) are commonly involved in fatal burns as this is most active group of population. In present study majority cases happened in summer season and were accidental in nature while suicidal deaths were present in significant number. Flame burns comprised of 80% of the cases followed by scald 13%. In 78% of cases more than 50 % of total body surface area was involved while complications like Septicemia (66%) was commonest cause of death.

***Key Words:*** *Burn deaths, Pune region.*

## Introduction

A burn is an injury which is caused by application of heat or chemical substances to the external or internal surfaces of the body, which causes destruction of the tissues; thermal deaths are those which results from the effects of systemic and/or localized exposure to excessive heat and cold [1]. Thermal burns and related injuries are major cause of death and disability. Even in developed countries more than two million individuals annually are burned seriously and require medical treatment[2]. The magnitude of deaths due to burns is so large in our country that India is the only country in the world where fire is classified among the fifteen leading causes of death[3]. The prognosis of the burn injuries depends more upon the extent of body surface involved than upon degree/depth of the burns, which is traditionally determined by the rule of nines[4]. Burns are injuries produced by the application of dry heat such as flame, radiant heat or some heated solid substance to the surface of the body; while scald is moist heat injuries produced by 5. Most of the deaths from burn injuries occur from shock within 24-48 hours; death due to toxaemia usually occurs within 4-5 days6. The purpose of this study is to study and analyze epidemiology with respect to age, sex, season and manner of death wise variation of burn deaths, also further study in detail for agent responsible for burns, percentage of total body surface area burned and cause of deaths in the Pune region of Maharashtra and to compare them with other studies.

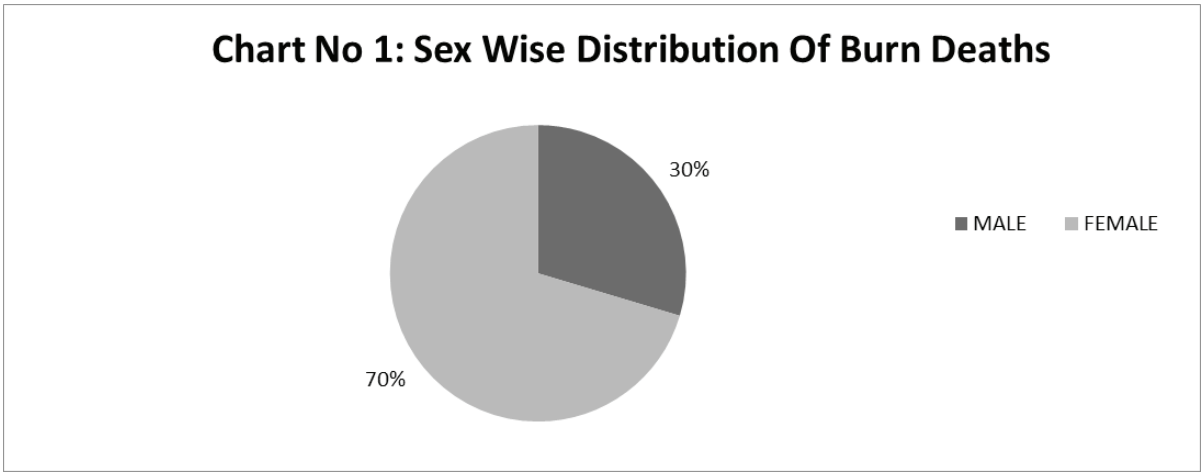
## Material and Method

In the present study, the medicolegal autopsies conducted between January 2015 to December 2019 at B.J. Government Medical College and Sassoon General Hospital, Pune, Maharashtra are analyzed retrospectively. Necessary information for the study is gathered from Police inquest report, hospital treatment records and discussion with the relatives, friends, and neighbors of the victims. The cases are studied to know the incidence of burn deaths with respect to age group, sex, and seasonal variation, further studied for manner of death, agent responsible for burns, percentage of total body surface area burned and cause of death wise variation of burn deaths.

## Observations and Discussion

During the study period total 1710 medicolegal autopsies in burn deaths were conducted at B.J.

Government Medical College and Sassoon General Hospital, Pune.

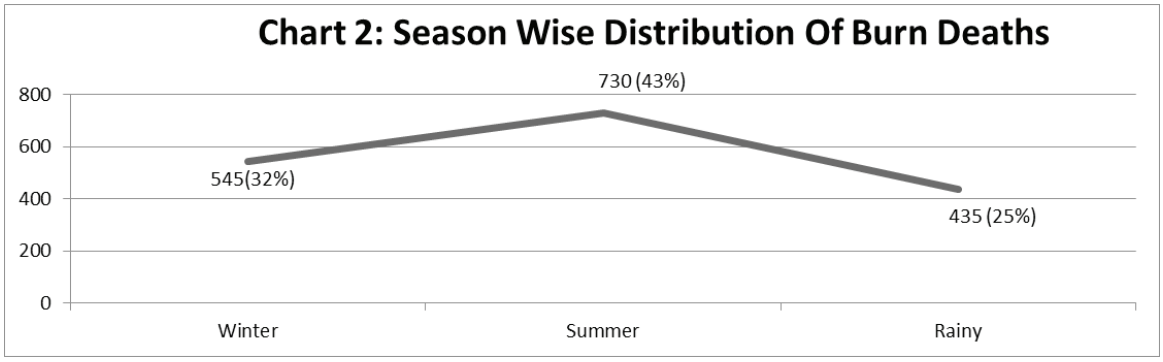



In the present study, females (1185) i.e. 70% were more commonly affected than males (525) i.e. 30% (Chart 1); similar findings were observed by Batra et al3, Ambade et al6 and Subrahmanyam M7; this can be explained by in India females being largely involved in domestic kitchen work that too at a very young age, with kitchen related activities place them at high risk of fatal burn accidents and also in our developing country child marriages and heinous dowry system being still prevalent likely leads to depression- suicide deaths and homicidal dowry deaths by burning incidents. The studies carried out in other developed countries showed male predominance like that in Japan 8, China9, Singapore 10 and South Korea 11 and which may be explained by the fact that because of rapid industrialization in these countries, male become more susceptible to fatal burns at work place.

**Table 1: Age Wise Distribution of Burn Deaths**

| **Age group of deceased** | **Burn deaths** |
|---|---|
| 0 to 10 years | 148 |
| 11 to 20 years | 150 |
| 21 to 30 years | 475 |
| 31 to 40 years | 292 |
| 41 to 50 years | 234 |
| 51 to 60 years | 70 |
| 61 to 70 years | 186 |
| More than 70 years | 155 |
| Total deaths | 1710 |

In the present study, highest number of deceased belonged to age group of 21 to 30 years, followed by 31 to 40 years (Table 1).These findings are consistent with studies conducted by Ambade et al6, Subrahmanyam M7 and Singh D et al12 this can be attributed to the fact that age group 21–40 yrs belongs to young adults, which are commonly involved in fatal burn accidents in India as it is the most active group of population so more likely to be exposed to stress and family violence and burns may occur while working where awareness and adequate safety measures are not in place.

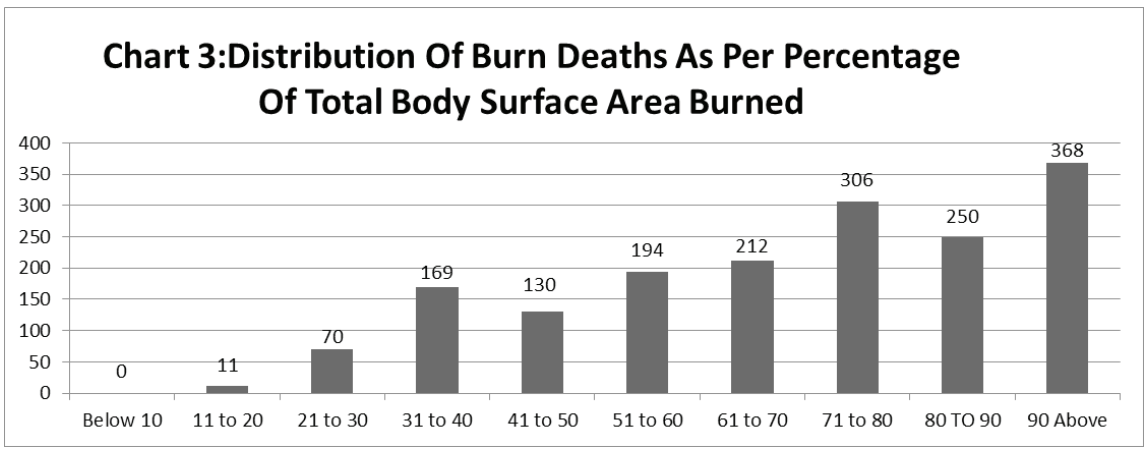



In the present study, when the burn deaths were analyzed in accordance with season, majority of cases 730 were in summer days followed by 545 in winter and then lowest 435 in rainy season (Chart 2).

**Table 2: Manner Wise Distribution of Burn Deaths**

| Manner | Accidental | Suicidal | Homicidal | Total Deaths |
|---|---|---|---|---|
| Burn deaths | 1308 | 326 | 76 | 1710 |

In present study out of 324 burn deaths, majority cases i.e. 1308 (79%) were Accidental deaths while 326 cases were Suicidal and 76 cases were Homicidal in nature (Table 2). These findings are consistent with studies conducted by Batra et al4, Ambade et al5, Singh D et al6 and Subrahmanyam M7, this maybe because of frequent exposure to cooking, inadequate knowledge of handling high pressure stoves, too much demand of work leading to hurried job and accidents, the cooking activities involving fire associated with wearing of loose synthetic material leads to accidental burns. Suicidal and homicidal deaths were more common in married females. The reason for this may be old custom of dowry and marital disharmony which compel the married females either to commit suicide or they may be killed by their in-laws and husband.



In the present study, it is observed that in 1330 cases (78%) more than 50 % of total body surface area was involved while in 380 cases (22 %) it was less than 50% (Chart 3); this is consistent with studies conducted by Mangal HM et al13, Zanjad NP et al 14 and Chawla R et al15, which showed 77.34%, 84.4% and 86% cases respectively for surface burns more than 50% of total body area. It suggest that as the percentage of total body surface area burned involved goes on increasing the mortality rate in the patients increases.

**Table 3: Responsible Agent Causing Burn wise distribution of Burn deaths**

| Agent Responsible For Causing Burn | Number of Burn deaths |
|---|---|
| Flame | 1368 (80%) |
| Scald | 216 (13%) |
| Electric | 114 (6%) |
| Chemical | 12 (1%) |
| Total deaths | 1710 |

In the present study, flame burns comprised of 1368 (80%) of the cases, followed by scald 216 (13%) and electric burns 114 (6%) while chemical burns were observed in 12 cases (Table 3). These findings are consistent with studies conducted by Batra et al4, Ambade et al5, Singh D et al6 and Subrahmanyam M7.

**Table 4: Cause of death wise distribution of Burn deaths**

| Cause of death | Number of Burn deaths |
|---|---|
| Shock (Hypovolemic or Neurogenic) | 112 (34%) |
| Complications like Septicemia | 212 (66%) |
| Total deaths | 1710 |

Immediate cause of death in burns is due to primary or neurogenic shock, secondary shock can cause death within 24 to 48 hours While after about 3-4 days toxaemia, septicaemia, acute renal failure, respiratory complications, thromboembolism causes death and after one week multiple factors comprise are sepsis, nutritional deficiencies, gangrene, etc. come in picture1. In present study, shock was cause of death in 112 numbers of cases while in majority of cases ccomplications like Septicemia were commonest cause of death. Similar findings noted by the studies conducted by Batra et al4, Ambade et al5, Singh D et al6 and Subrahmanyam M7 , Bangal et al16 and Gupta el[17] .

## Summary and Conclusion

The present study can be summarized and concluded as; burn deaths are presented in significant number in day to day medicolegal autopsies. Among burn deaths, females are more commonly affected than males. Young adults (21–40 yrs) are commonly involved in fatal burns as this is most active group of population. In present study majority cases are Accidental and Suicidal deaths are present in significant number. It was found that flame burns caused majority of the cases, followed by scald while as the percentage of total body surface area burned involved goes on increasing the mortality rate increases and complications like Septicemia were commonest cause of death. The results of this study suggest a strong relationship between particular age

group and sex affected, manner of death, different causes of deaths; while focusing on these, attempts can be made to strategies therapeutic directions, medical and social interventions quite rightly to save life from burn deaths.

**Source of Funding:** None

**Ethical Clearance:** None.

**Conflict of Interest:** Nil

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# Pattern of Poisoning Cases in a Tertiary Care Centre in South India - An Observational study

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## Abstract

Poison is any substance which when administered, inhaled or ingested is capable of causing deleterious effects on the human body. This prospective study was carried out involving 353 cases of poisoning admitted in Sri Ramachandra Medical College & Research Institute Porur, Chennai, during the period of June 2014-June 2015. The demographic details were acquired from the patient, relatives, friends or the investigating officer and by going through the medical records and the inquest report. In the current study the maximum cases were in the age group of 20-29 years and the incidence decreased as the age increases and it was evident that the incidence of poisoning is more in case of females when compared to males. The material of maximum abuse was T.Alprazolam (10.8%), followed by Rat Killer poison (9.6%), and followed by Snake Strike (8.8%), Organo Phosphorus Poisoning (8.5%), and Multiple Tablet Overdose (8.2%). 78% consumed poison intentionally and are suicidal in nature, as no cases of homicidal poisoning were reported in the study group, rest of the 22% of cases, were of accidental in nature. Mortality wise analysis showed that dead cases count 13 in number which accounts to 3.5% of all poisoning cases.

***Key Words:*** *Pattern of poison, economic poisons, poisoning causes, outcome of poisoning*

## Introduction

Poison is any substance which when administered, inhaled or ingested is capable of causing deleterious effects on the human body.[1] The substances that are used to control insects, weeds, fungi, bacteria, rodents, predatory animals, or other pests are termed as economic poisons.[2]

According to the World Health Organization (WHO) data released in the year 2012, the poisoning deaths were estimated to be 193,460 worldwide. Of these deaths, 84% were reported in low and middle income countries. In the same year, poisoning was also reported to cause a huge loss of around 10.7 million disability adjusted life years (DALY).[3] It is also estimated that deliberate ingestion of pesticides contribute to 370,000 deaths each year. 3 The incidence of poisoning in India is among the highest in the world, which is estimated that more than 50,000 people die every year from toxic exposure. [4]

In India organophosphorous compounds form the largest bulk of pesticide poisoning. [4] The trend of poisoning has shown a change due to introduction of newer pesticides under different classes. Poisoning is a medico - legal, epidemiological, social problem, which is alarming and a constant threat to the society. To encounter this problem in a given area, knowledge about the poisons, their clinical aspects will not be sufficient. Various aspects of pattern of poisoning in that particular

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area is necessary, so that the law enforcing agencies, government and health departments can successfully bring down the poisoning incidence. With this broad view in mind, this study was carried out involving the data pertaining to all cases of poisoning admitted in Sri Ramachandra Medical College & Research Institute between the period of June 2014 to June 2015.

## Materials and Method

**Source of Data**

This prospective study was carried out involving 353 cases of poisoning admitted in Sri Ramachandra Medical College & Research Institute, Sri Ramachandra University, Porur, Chennai, during the period of June 2014 to June 2015. The study was approved by scientific and ethics committee of the institute.

**Inclusion Criteria**

· All cases of poisoning either suicidal or accidental, both directly admitted and referral cases during the period of June 2014 – June 2015.

· Snake Strike and Scorpion stings.

· Domestic as well as Commercial Poisoning.

**Exclusion Criteria**

· Cases without proper diagnosis (undetermined).

· Outside cases brought to SRMC mortuary with history of poisoning.

## Methodology

The demographic details were acquired from the patient, relatives, friends or the investigating officer and by going through the medical records and the inquest report. Among the admitted cases, if some turn out to be fatal, post mortem examination was done and in that the stomach was examined for any peculiar odour and the mucosa was also examined. The routine viscera which includes the entire stomach and a small part of intestine with its contents, part of liver, half of each kidney, blood (10-30 ml), urine (30-50 ml) if possible were sent to forensic science laboratory for further evaluation. Preservatives used were super saturated solution of sodium chloride for viscera and 10mg/ml Sodium fluoride for blood and urine. All the data collected were complied and analyzed statistically using SPSS software version 15.

## Observaton & Results

Distribution of study population based on age and gender is mentioned in table 1. The minimum age affected was 1 year old and maximum age affected was 80 years. Mean age of the study population was 28 years. Incidence of poisoning was also reported to be more in case of females when compared to males. Distribution of poisoning based on time of day (Annexure 1) and manner of poisoning is mentioned in Table 2, which shows that the frequency of poisoning is more in the evening and suicidal poisoning is more common. Among the type of poisoning Tab. Alprazolam is the most common agent used. Out of total 353 cases, death was reported in 13 cases (3.7 %) as shown in table 4.

**Table 1: Distribution of Study population based on age and gender (n=353)**

| **Age ( years )** | **Frequency (%)** |
|---|---|
| 1 – 9 | 39 (11.0) |
| 10 - 19 | 57 (16.1) |
| 20 – 29 | 127 (36.0) |
| 30 – 39 | 55 (15.6) |
| 40 – 49 | 34 (9.6) |
| 50 – 59 | 27 (7.6) |
| 60 – 69 | 9 (2.5) |
| 70 – 79 | 4 (1.1) |
| 80 - 89 | 1 (0.3) |
| Gender | Frequency (%) |
| Male | 160 (45.3) |
| Female | 193 (54.7) |

**Table 2 : Distribution of Study population based on the time and Manner of poisoning (n=353)**

| **Time** | **Frequency (%)** |
|---|---|
| Morning | 96 (27.2) |
| Afternoon | 96 (27.2) |
| Evening | 110 (31.2) |
| Night | 51 (14.4) |
| | |
| Manner | Frequency (%) |
| Suicidal | 275 (77.9) |
| Accidental | 78 (22.1) |

**Table 3: Final outcome of poisoning cases (n=353)**

| **Final Outcome** | **Frequency ( % )** |
|---|---|
| Alive | 237 (67.1) |
| Dead | 13 (3.7) |
| Refereed to other hospitals | 103 (29.2) |

## Discussion

The total number of cases admitted in Sri Ramachandra Medical College and Research Institute from June 2014 to June 2015 was 26,190 cases, out of which 4,498 cases were Medico-Legal Cases (MLC). Among the MLC, poisoning accounts for 353 cases. As the institute is a tertiary care centre, the numbers of cases are more when compared to most of the other studies to which this research work is compared.

In the current study age-wise distribution of poisoning cases revealed that the maximum cases are in the age group of 20-29 years and the incidence decreased as the age increases (Table 1). The minimum age affected was 1 year old and maximum age affected was 80 years. Mean age group for poisoning is 28 years. Young adults are affected more as they are more exposed to stressors like job, marital issues, financial problems etc., Sex-wise distribution of poisoning cases revealed that out of the total 353 cases, 160 cases i.e (45.3%) were males and 193 cases i.e (54.7%) were females and it is evident that the incidence of poisoning is more in case of females when compared to males (Table 1).

Poison wise distribution reveals among the 353 cases, the material of Maximum abuse was T.Alprazolam (10.8%), followed by Rat Killer poison (9.6%), and followed by Snake Strike (8.8%), Organo Phosphorus Poisoning (8.5%), and Multiple Tablet Overdose (8.2%). Materials which are least used were mainly house hold items such as bleaching powder, match stick, nail polish and apart from it substances such as diesel, cracker powder, crude oil, datura, and allopathic medicines were also used (Table 3). In 15 cases, the material consumed was not known and some 7 cases reported with unknown Bite. This clearly indicates that from the old trend of pesticide poisoning, tablet overdose has occupied the place of it. This can be due to two reasons. One, as the hospital is a tertiary care centre with most of the cases who are admitting here belong to a middle to higher socio-economic status, their common source or affordable poison are the tablets. Among the tablets alprazolam tops the list. The second reason is the easy availability of the tablets and the strict laws on pesticide purchase. The second new entry to the list is the rat killer, which now comes in paste containing yellow phosphorus in it. These two are the new materials used for poisoning which was not found in any of the studies

which we came through. In most of the studies like that of mani et al, which revealed that organophosphorous compounds are the most commonly consumed poison in both sexes during the study period. Similar study carried out by Bharath K Guntheti Udaypal Singh 5 stated that insecticide poisoning was the commonest poison (77.86%) in which organophosphorous was the common compound (74.10%) followed by organochlorines (2.39%) and carbamates (1.39%). Study conducted by Ramanath K.V. Naveen Kumar H.D 7 reported that pesticide poisoning in 57.5% cases is more common followed by bites (Snake bite/Bee sting) 13.6%. Study conducted by, Dr. Gargi.J, Dr. Hakumat Rai, Dr. Ashok Chanana, Dr.Gurmanjit Rai et al 9 stated that Aluminium phosphide poisoning is commonest 38.23% followed by Organophosphorous compounds 17.64%. Study conducted by Tejas Prajapati, Kartik Prajapati, Rakesh Tandon, Saumil Merchant 11 revealed that the most common was pesticides (33.9%), followed by household chemicals (26.8%). Study conducted by, Subash Vijaya Kumar, Venkateswarlu.B, Sasikala.M, and Vijay Kumar.G 12 reported that pesticide poisoning 29.55 % is the commonest followed by bites (snake, scorpion, unknown bite) 26.83%. Study conducted by Vinay B shetty. Gurudatta S Pawar., Inamadar. P.I.,13 reported that the commonest type of poisoning was with organophosphorous compounds (73.14%). Study conducted by Ansam F Sawalha., Waleed M Sweileh., Maysoon T Tufaha. and Dua Y Al-jabi. 15 reveals that animal envenomation (72.5) was the commonest type of poison. "Use it to Dye not to Die" A study conducted at Sri Venkateswara Institute of medical sciences (SVIMS University) Tirupati – Andhra Pradesh.14 indicates that hair dye poisoning is the new emerging suicidal poisoning more so in case of females with a male female ratio of (1 : 2.4). But in our study, we didn't have even a single case of hair dye poisoning.

Manner of poisoning reveals that majority of the cases, 78% consumed poison intentionally and are suicidal in nature, as no cases of homicidal poisoning are reported in the study group, rest of the 22% of cases, are of accidental in nature.

Till date, hanging is the most common method of committing suicide but poisoning is on a new trend. Apart from really committing suicide, poisoning nowadays is mainly used as a method to threaten people of committing suicide. Studies conducted by, Dr. Gargi.J, Dr. Hakumat Rai, Dr. Ashok Chanana, Dr.Gurmanjit Rai etal 11, Unnikrishnan B, Singh B, Rajeev A6, Vinay B shetty. Gurudatta S Pawar., Inamadar. P.I 15, have also reported that suicidal poisoning is more common than homicidal poisoning. In the study conducted by, Ramanath K.V. Naveen Kumar H.D 10,

In our current study mortality wise analysis showed that Dead cases count 13 in number which accounts to 3.5% of all poisoning cases. Out of 13 cases, Paraquat and rat killer (Yellow Phosphorus) caused death of 3 persons each, followed by Organo – phosphorus compound, snake strike, unknown poisoning caused death of 2 persons each and oleander 1 person. Study conducted by Bharath K Guntheti Udaypal Singh 5 reported that overall mortality rate was 17.33%. Overall mortality rate in the study conducted by Shoaib Zaheer.M, Aslam.M, Vibanshu Gupta, Vibhor Sharma and Shadab Ahmad Khan 15 was found to be 14.4%. Overall mortality rate in the study conducted by Unnikrishnan B, Singh B, Rajeev A was 5.7% 5 and the overall mortality rate in the study conducted by, Tejas Prajapati, Kartik Prajapati, Rakesh Tandon, Saumil Merchant 12 was reported to be 18.6%.

## Conclusion

- Poisoning is more common among the adult age group, with a mean of 28 years.

- Poisoning was more common among females when compared to males.

- In the context of poisoning, the most common and an emerging trend change is from pesticides to tablets. T.Alprazolam leads the way with maximum incidence followed by Rat Killer poison, snake strike, Organo Phosphorus poisoning , and multiple tablet overdose .Household items like bleaching powder, match stick, nail polish and other products like diesel, cracker powder, crude oil, Datura, and allopathic tablets are also in increasing trend.

- 78% of cases are suicidal whereas 22% were accidental in manner and 3.5% of death was reported from our study

- Paraquat was the deadliest poison with both free radical action along with the corrosive action causing death of 3 out of 6.

- Rat killer (Yellow Phosphorus – paste form) and oleander are equally dangerous.

- As attempts to commit suicide are on the rise, identifying the cause and treating the suicidal tendencies

due to psychological issues is vital in prevention of further attempts. Hence, in our institution all cases of suicidal poisoning (those who survived) were referred to the department of psychiatry and psychiatric counseling was given to all the cases of suicidal poisoning.

Annexure 1:

Standardization Criteria.

Division of a Day.

| | |
|---|---|
| Morning | 6.00 A.M – 12.00 P.M |
| Afternoon | 12.00 P.M – 6.00 P.M |
| Evening | 6.00 P.M – 12.00 A.M |
| Night | 12.00 A.M – 6.00 A.M |

Ø Conflict of Interest: Nil

Ø Source of Funding: Self

Ø Ethical Clearance: The study was approved by the Ethics committee of the institute.

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# Estimation of Stature from Footprint Length

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## Abstract

The human foot is studied for various reasons in forensic departments, by anthropologists, anatomists etc. Footprints are of immense value in a crime scene in establishing the personal identity and in a potential link between the perpetrator and the scene of crime. Identification of a person is of prime and foremost importance in both civil and criminal cases. Time is a critical factor in crime scene investigation, so rapid identification of suspect is very important. Here, in our study, the aim is to estimate the stature of individuals based on their footprint lengths among the students (Both male and female students between the age group 18 to 22 years) 50 male and 50 female students, studying in Rajarajeswari Medical College and Hospital, Bengaluru. that the footprint length help us in estimating the stature of an unknown individual which will be helpful in investigation of various crimes. Also not much difference is statistically noted in the stature estimated by right and left footprint length in both the sexes.

***Keywords:*** *Stature; Foot print length; Identification.*

## Introduction

To establish the identity of a person if alive or expired is called identification of a person. The Latin word, 'idem' known as "the same"1 is from which the word identification has its origination. Determination of identity of a person in case of emergency disasters like bomb blast, hurricane, train wreck, flight fall, earthquake etc. will not be an easy task for an autopsy surgeon to rectify the clarification of identity of a person from an amputated body part.2 stature, in the pharmacological aspect is also important for to determine the nutritional range and for the estimation of pharmacokinetic measures of a person. The identification of a male or a female is made easier if the stature of a person is determined in any sort of investigation to determine the identity of a person.3

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## Aims and Objectives of the Study

To estimate the stature of individuals based on their footprint lengths

## Material and Method

Materials used are as follows:

1. Printers black ink,
2. Non- breakable glass plate,
3. White sheets,
4. Roller,
5. Pencil,
6. Measuring scale,
7. Measuring tape,
6. Calculator and
7. Proforma.

Collection of Footprints

Both male and female students those who are studying in Rajarajeswari Medical College and Hospital,

Bengaluru -560074, between the age group 18 to 22 years will be included in the study. The consent of those students will be obtained in a pre-designed and pre-tested pro-forma consisting the objectives of the students after explaining them the aim and objective of the study.

A glass plate of 24x24 inches cleaned and smeared uniformly with painters ink will be kept on the floor.

The students after washing and drying their feet will be asked to stand on the smeared glass plate first and then, on two separate white sheets so that prints of right foot and left foot will be transferred on these white sheets separately. In this way footprints of all the individuals will be recorded. The footprint length will be measured from the heel to the tip of extension of longest toe.

Then all the students will be asked to stand bare foot and erect on the floor with their heel and occiput attached to the wall where markings for measuring height are already made. The students will be asked not to move the head. A thin plate is kept horizontally at the vertex of the head. Then the height will be measured from heel to the horizontal thin plate. Height of the individual will be measured in cm to the nearest mm.

The data collected is analyzed statistically by using descriptive statistics, namely percentage and standard deviation. The results will be predicted using SPSS version 20, if required, using leniar regression equation for stature estimation and to assess the co-relation between the footprint length and stature, Pearlson's correlation coefficient method will be adopted.

PLACE OF STUDY: Rajarajeswari Medical College and Hospital, Bengaluru-560074.

DURATION OF STUDY: 1 year and one month.

SAMPLE SIZE: 100 students(50 males and 50 females)

**Inclusion Criteria**

1. Both male and female students who are studying in RajaRajeswari Medical College and Hospital, Bengaluru-560074 between the age group 18 and 22 years.

2. Students of both sexes.

3. Age group between 18 years to 22 years.

**Exclusion Criteria:**

1. Students other than the age group 18 to 22 years.

2. Students with any abnormality of foot/lower limb.

3. Students with any spinal abnormality.

4. Students with any endocrinal disorders.

## Sampling Method

Convenient sampling method.

## Results

**Table-1: Correlation between Right Foot Print Length, Left Foot Print Length and Stature in Male Students**

| Variable | N | Mean ± SD | Range | Cor. Coeff. r-value | Reg. Coeff. b-value | Reg. Equation |
|---|---|---|---|---|---|---|
| RFPL<br>Actual Ht | 50<br>50 | 24.7±1.25<br>173.5 ± 6.64 | 22.3–28.0<br>156 – 196 | + 0.659 | 3.49 | Ht = 86.89+ 3.49 (RFPL) |
| LFPL<br>Actual Ht | 50<br>50 | 24.8±1.29<br>173.5±6.64 | 21.6–28.6<br>156 – 196 | + 0.0652 | 3.34 | Ht =90.15 + 3.34 (LFPL) |

RFPL = Right Footprint Length LFPL = Left Footprint Length

Ht = Height Comparing Right Footprint Length and Left Footprint Length P - 0.0

Table no.5 represents the height of 50 male students and the co-relation between the right and left foot print length.

The average of the right footprint is slightly larger than the left.

A relavant co–relation between the right footprint with stature (r = 0.659) and the left footprint length with stature (r = 0.0652). The difference in co-relation coefficient is statistically significant (p- 0.000). To determine the stature based on any given right or left footprint length can be made with this significant co-relation.

When one such right footprint length is given, the stature can be estimated by the regression equation.

Ht = 86.89+ 3.49 (RFPL)

When one such left footprint length is given, the stature can be estimated by the regression equation.

Ht =90.15 + 3.34 (LFPL)

**Table-2: Correlation between Right Foot Print Length, Left Foot Print Length and Stature in Female Students**

| Variable | n | Mean ± SD | Range | Cor. Coeff. r-value | Reg. Coeff. b-value | Reg. Equation |
|---|---|---|---|---|---|---|
| RFPL<br>Actual Ht | 50<br>50 | 22.3±1.125<br>157.78±6.65 | 19.8-24.9<br>144-172 | +0.761 | 4.426 | Ht = 58.93+4.42 (RFPL) |
| LFPL<br>Actual Ht | 50<br>50 | 22.2±1.1<br>157.78±6.65 | 19.8-25<br>144-172 | +0.747 | 4.438 | Ht = 59.08+4.43 (LFPL) |

RFPL = Right Footprint Length LFPL = Left Footprint Length

Ht = Height

Comparing Right Footprint Length and Left Footprint Length P - 0.00

Table no.6 represents the height of 50 female students and the co-relation between the right and left foot print length.

The average of the right footprint is slightly larger than the left.

A relavant co–relation between the right footprint with stature (r = 0.761) and the left footprint length with stature (r = 0.747). The difference in co-relation coefficient is statistically significant (p- 0.000). To determine the stature based on any given right or left footprint length can be made with this significant co-relation.

When one such right footprint length is given, the stature can be estimated by the regression equation.

Ht = 58.93+4.42 (RFPL)

When one such left footprint length is given, the stature can be estimated by the regression equation.

Ht = 59.08+4.43 (LFPL)

**Figure-1: Method of recording footprint**

**Figure 2. Right footprint of a student**

**Figure 03. Measuring height of a student**

**Ethical Clearance-** obtained from institutional ethical committe

**Source of Funding-** Self

**Conflict of Interest-** Nil

## Discussion

Stature can be estimated from many parameters of the body parts, also the researches were made on them by many researchers. But very few researchers estimated stature from footprint length. Researchers did their work for footlength in both sexes but for the footprint length is rare. Our study is on both sexes of both right and left footprint length to estimate stature from it.

But in the study done by Devesh VO (2006)4, Danborno B (2008)5 and Vidya CS6, the footprint is lengthier in men than the women which is of same results as our study.

In our study, the footprints of both the foot in both sexes gives the height of an individual approximately for each foot and this is also seen the study made by Theodoros B Grivas7 (2008).

Our study gives the regression equations for both the

footprint length by which the height can be determined whereas the stature from the known footlength only can be determined by a regression formula in the study made by Abraham Philip8 .

In our study, only the length of the longest toe to the tip of the sole is taken to give the height of the student whereas in the work done by Jaydeep Sen (2008)9

The girls are less in height and they have length of their foot also little short than the boys. Also he stated that there is a good relationship which is significant between the height and the length and the breadth of the individuals foot.($P<0.01$).

Separate regressions equations were developed for both the footprints of both the genders in our study similarly, a study which was done only on males which had significance in the footlength and height with a $P < 0.001$ by Raju M10 (2009)

Also a similar research results were noted among the individuals of Uttarakhand region by Deopa Deep11 (2010)

## Conclusion

Though the stature and the relationship with their body parameters differ from region, culture nutrition etc., the relationship between foot length and stature is reliable. Still there will be difference in the results in different regions for the same reasons.

The formula concluded in this study is not of cent percent result giving but an approximate stature can be estimated from a person's footprint. Also the people with the mentioned exclusion criteria in this study, their stature cannot be estimated from this formula.

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# Effect of Structured Exercise Programme on Functional Mobility in Parkinson's Disease

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## Abstract

**Background:** Parkinson's disease is common movement disorder seen in neurological practices but the management and diagnosis is quite challenging. Physical rehabilitation is commonly used to improve the health condition and relieve the symptoms along with the pharmacological treatment.

**Aim and Objectives:** 1.To find the effect of structured exercise programme on functional mobility in Parkinson's disease. 2. To evaluate the motor and non-motor symptoms present in Parkinson's disease. 3. To find the effect of structured exercises on functional mobility in Parkinson's disease.

**Material and Method:** Study was carried out in Department of Neuro physiotherapy, KIMSDU, Karad. Assessments include Unified Parkinson's Disease Rating Scale [UPDRS] and Hoehn and yahr scale for Parkinson's disease. Subjects participated in their respective interventions for 6 weeks. Statistical analysis was done using instat software. Paired t test was used to calculate the response.

**Result:** The study included twenty patients were recruited for the study. Out of which 14 were male (70%) and remaining 6 subjects were female (30%). This is analyzed that outcomes which are clinically significant were Hoehn and yahr scale of functional mobility in Parkinson's disease (P value: < 0.0001 and t test: 8.904) and Unified Parkinson's Disease Rating Scale II and III (P value: < 0.0001 and t test: 10.282). Significant improvement was observed with the outcome measures used for the study.

**Conclusion:** Physical exercises can contribute effectively in improving the functional mobility in Parkinson's disease and can help to maintain the physical fitness.

***Keywords:*** *Parkinson's disease, physical exercises, structured exercises, functional mobility*

## Introduction

**Definition:**

Parkinson's disease (PD), a progressive neurodegenerative disorder, is manifested by a loss of dopaminergic neurons from the substantia nigra pars compacta there by disrupting the basal ganglia circuitry.[1] It was first described in 1817 by a physician named James Parkinson as shaking palsy[2], it is one of the chronic diseases associated with aging, as well as risk factors such as exposure to drugs, head trauma, pesticides and drugs (cocaine, heroin)[3]

**Prevalence:**

The incidence and prevalence of PD increases with advancing age, present in 1% of people all over the age of 65 years.[4] PD is twice as common in men than in women in most populations.[4] The clinical hallmarks of the disease include rigidity, bradykinesia, tremor, and loss of postural control.[5] It is a complex disorder with wide reaching implications for patients and their families.[6] The management of Parkinson's disease is traditionally centered on drug therapy, but even with optimal medical

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management, patients still experience a deterioration of body function, daily activities, participation, and decline in mobility.[6] The motor impairment in PD patients caused by bradykinesia, rigidity, tremor, and postural instability accelerates the decline in functional capacity, especially when associated with decreased activity and with a sedentary lifestyle.[7]

Along with postural instability gait alterations, with consequent impairment in balance increase the risk of falls. Moreover, another 2 typical features are also present: Festinating gait or festination is referred to the patient's sudden acceleration as an attempt to keep their center of gravity between their feet in order to compensate for their flexed posture.8 Freezing of gait (FOG) is defined as a sudden stop in the patient's gait, often with legs trembling in place and the sensation of being "glued" to the floor.[8]

This symptom manifests more frequently while turning, when the path gets changed or more narrow, in a diagonal direction, when dealing with obstacles and other stressful situations or just before reaching the destination.[8]

Subjects affected by PD also experience several non-motor symptoms, such as autonomic dysfunctions (dysphagia, constipation, urinary incontinence, sexual dysfunction, orthostatic hypotension) cognitive impairment, dementia, depression (which affects 30 - 40% of patients), anxiety, sleep disorders and decreased olfactory sense. More immediate effects include improved motor performance, cognitive and functional ability.[1]

An estimate of the stage and severity of the disease can be made using a staging scale. The most widely used in clinical practice and research trials is the Hoehn-Yahr classification of disability Scale.[9]

Physical rehabilitation plays important role in the maintenance and improvement of mobility, transfers6, posture, and balance in PD patients.[7] These mobility deficits are difficult to treat with drugs or neurosurgery.10,11Different modalities of non-pharmacological treatment such as physiotherapy (P), walking, running, strength training (ST), functional exercises, and whole body vibration significantly reduced the risk of falls and improved motor performance, balance and gait,[10] and executive functions.[7]

Available data in the literature indicate that any rehabilitation protocol has to focus on: cognitive movement strategies, cueing strategies, and improved physical capacity and balance.[8] Different training programs for PD patients have been designed and evaluated but only specific training strategies tailored and individualized for each patient, may produce improvements in gait speed and stride length, decrease motor and balance symptoms and improve quality of life.[8]

Community-based strength and fitness programs, auditory cueing from metronomes, and visual cues, combined therapy programs that incorporate cues, stretches, functional training, gait and balance training, and relaxation exercises have all been found to be effective for improving movement.[12]

Improving physical capacity with aerobic training, strength and flexibility exercises may reduce symptoms as well as improve the patient's general well-being and quality of life.8 Resistance training can produce functional improvement in gait and may, therefore be useful as part of physical rehabilitation.13 Progression of PD generates socioeconomic and occupational hazards.14 Physical exercise has demonstrated a reduction in mortality rate in individuals with PD and, albeit modestly, a protective effect for PD risk.

Till date there are many neurophysiological techniques devised for body functioning but there is no fixed protocol for recovery so we can try to device a particular protocol as it is required for functional independence and better quality of life.

This could be the baseline source for different treatment pattern in Parkinson's disease. And improvement in the clinical characteristics can be seen.

## Aims and Objectives

**Aims:**

- To find the effect of structured exercise programme on functional mobility in Parkinson's disease.

**Objectives:**

- To evaluate the motor and non-motor symptoms present in Parkinson's disease.
- To find the effect of structured exercises on

functional mobility on various stages of Parkinson's disease.

## Material and Methods

1. Type of study : experimental study

2. Study design : pre and post

3. Place of study : KIMSDU

4. Sample size : supposed to be 30

N= 4sd2 /(x×£)2

N= Sample size

SD= Standard deviation

x= Mean

N= 4(3)2

(3*0.4)2

= 36

1.44

= 25

Calculating the error, minimum 20 sample size.

5. Study duration : 6 months

6. Inclusion Criteria:

1. Subject diagnosed with Parkinson's disease

2. Subjects have impairments in functional mobility following Parkinson disease

3. Both sex

7. Exclusion Criteria:

1. Neurological ill patients other than Parkinson's disease

8. Material required:

1. Assessment chart

2. Writing material

3. Computers and online accessing

9. Outcome measures :

Hoehn and yahr scale for Parkinson's disease

Unified Parkinson's disease rating scale II and III

Procedure:

Subjects taken for my study were those who were diagnosed with Parkinson's disease.

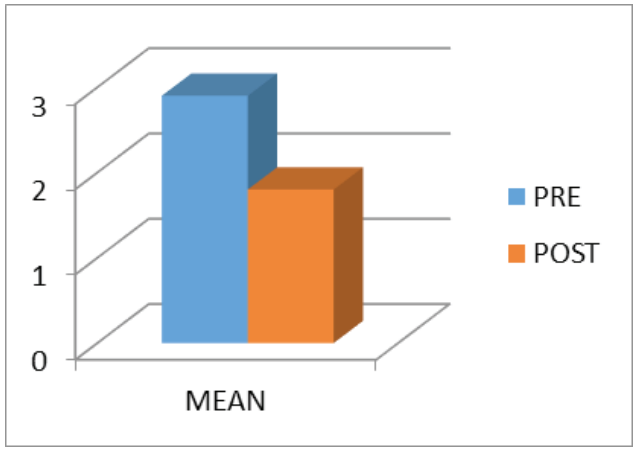
Subjects underwent detail assessment to fulfill the inclusion and exclusion criteria. Once the subject fulfilled criteria, they were explained about the study and detail information was given to them and consent was taken. Assessment was taken with the appropriate outcome major and pre-test will be done. 6 week exercise protocol will be given and follow-up for progression will be done. Later, again post-test will be done and result will be taken.

## Findings

Out of 20 patients, there is a more no. of male survivors than female. (Table1). Pre and post assessments done with Hoehn and yahr scale for disability and UPDRS (Table 2 and 3 respectively).

Table1: Gender distribution

| GENDER | TOTAL |
|---|---|
| MALE | 14(60%) |
| FEMALE | 6(30%) |
| Total | 20 |



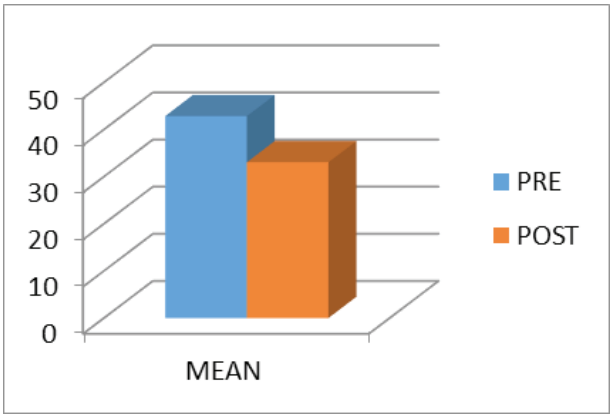

**GRAPH 1: PRE AND POST TEST WITH HOEHN AND YAHR SCALE**

**Table 2: HOEHN AND YAHR SCALE (FOR FUNCTIONAL MOBILITY)**

| | PRE TEST | POST TEST |
|---|---|---|
| Mean ± SD | 2.9±0.9679 | 1.8±1.005 |
| t test | 8.904 | |
| P value | < 0.0001 | |
| Significance | Extremely significant | |

**Interpretation:**

The above table and graph shows post training there was extremely significant improvement noted according to the p values.




**GRAPH 2: PRE AND POST TEST WITH UPDRS**

**Table 3: UPDRS SCALE (FOR FUNCTIONAL MOBILITY)**

| | PRE TEST | POST TEST |
|---|---|---|
| Mean ± SD | 42.85±24.11 | 33.05±22.46 |
| *t* test | 10.282 | |
| P value | < 0.0001 | |
| Significance | Extremely significant | |

**Interpretation:**

The above table and graph shows post training there was extremely significant improvement noted according to the p values.

Table 2 and 3 shows that extremely significant improvement is observed according to the p values.

## Discussion

This study "Effect of structured exercise programme on functional mobility in Parkinson's disease" was conducted to find the effect of structured exercise programme on functional mobility in Parkinson's disease. The clinical hallmarks of include rigidity, bradykinesia, tremor, and loss of postural control. It is a complex disorder with wide reaching implications for patients and their families. It increases the dependency of the patient, reduces efficiency and social participation and also affects the self-esteem.

The objectives of the study were to evaluate the motor and non-motor symptoms present in Parkinson's disease and to find the effect of structured exercises on functional mobility in Parkinson's disease.

The study was conducted with 20 subjects. Out of which 14 were male and remaining 6 were female subjects. Prior consent was taken from them. The interventions were carried out for 5 days per week for 6 weeks. The outcome measures for this study were Hoehn and yahr scale for Parkinson's disease, Unified Parkinson's disease rating scale

Pre and post tests were done using the outcome measures for assessing functional mobility in Parkinson's disease. The progression of PD leads to an increasing inability to perform daily activities, loss of independence, and a decreased quality of life, and it generates socioeconomic and occupational hazards. Progress of Parkinson's disease is multidimensional as many systems of body gets involved step by step. This mainly includes musculoskeletal, neurological systems. With every stage, clinical signs go on changing which makes rehabilitation challenging. Every feature needs to be addressed as they are closely associated with one another. Therefore physiotherapy treatment also needs to be reevaluated and changed every now and then.

The study, Comparison of strength training, aerobic training, and additional physical therapy as supplementary treatments for Parkinson's disease: pilot study conducted by Carvalho A et al, showed that strength training and aerobic exercise training in patients with PD are associated with improved outcomes in disease symptoms and functional capacity.

Structured programmes have been shown very effective results on various disoders like stroke. Different components like gait training,15 hand training 16with structured exercises have been shown to have better outcomes.

Also, previous study, Parkinson's Disease and Resistive Exercise: Rationale, Review, and Recommendations done by Michael J. Falvo, MS et al (2007) was aimed to establish the rationale for efficacy of resistive exercise in individuals with PD and concluded that available resistive exercise intervention have increased the muscle strength. Exercise program aimed at improving range of motion combined with activity-related (e.g., gait or balance) exercises, improves ADL functioning. Furthermore, it is plausible that, in PD, a strength-training program increases muscle power. Structured exercise programme given to subjects received range of motion exercises, strengthening exercises, stretching, balance training, gait training, exercises to improve functional capacity and activities of daily living. This study shows that these structured exercises showed significant improvement in the outcome variables concluding that it improves quality of subjects with Parkinson's disease. This was confirmed using statistical analysis by using 'Paired t- test.

Hoehn and yahr rating scale of Parkinson's disease: Mean ± SD score for pre and post test was, 2.9± 0.9679 and 1.8 ± 1.005 respectively. Post training, extremely significant improvement was noted with functional mobility. P value: < 0.0001 t test: 8.904

Unified Parkinson's disease rating scale II and III: Mean ± SD score for pre and post test was, 42.85±24.11and 33.05±22.46 respectively. Post training, extremely significant improvement was noted with functional mobility. P value: < 0.0001 t test: 10.282

These results demonstrate that pharmacological treatments along with physical exercises may promote better results for symptoms such as rigidity and bradykinesia. Repetitive exercises and training can help in improving functional mobility. The task was made more complex by setting a time limit and increasing the intensity of exercises.

And so, this study showed significant clinical improvement in functional mobility, indicating that prescribing exercise with controlled intensity, duration, and frequency may improve the physical health of patients with PD.

## Conclusion

Structured exercises on basis of recovery pattern and stages plays an effective role in improving functional mobility in Parkinson's disease thereby improving quality of life.

**Conflict of Interest:** There was no conflict of interest in this study.

**Source of Funding:** This study was funded by Krishna institute of medical sciences deemed to be university , Karad

**Ethical Clearance:** Ethical clearance was taken from institutional committee of Krishna institute of medical sciences.

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# A Study to Assess the Knowledge on Pubertal Changes and Menarche among Adolescent Girls Residing in A Selected Rural Community, Kanchipuram District, Tamilnadu

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## Abstract

A study was conducted to assess the level of knowledge on menarche and pubertal changes among adolescent girls residing in a selected rural community. The objectives were to assess the level of knowledge of adolescent girls among menarche and puberty, to find out the association between the level of knowledge on menarche and puberty with selected variables like age, educational status, occupation, and income status .

The sampling technique is non probability convenient sampling technique with the sample of 50 adolescent girls. A Questionnaire was formulated, and used to assess the level of knowledge. The collected data was tabulated and analyzed. Descriptive and inferential statistics were used.

The results were 11% adolescent girls were having adequate knowledge and 33% adolescent girls were having moderately adequate knowledge and 6% of adolescent girls were having inadequate knowledge. So, it shows that more teaching programme to be implement to promote knowledge and hygiene among the adolescent girls. So such research studies will help to increase the knowledge level of the adolescent girls leading to improvement in quality care thereby reducing the mortality rates of reproductive tract infections.

***Key words:****. Assess , Knowledge , pubertal changes, menarche and adolescent girls.*

## Introduction

Embrace and naturalize Your cycle as a way of nurturing a healthy relationship within yourself as a woman."

- clavel-chapelon F ( 2002)

Puberty is a transitional period between childhood and adulthood, which includes the process of rapid growth, development, and maturation in terms of physical, psychological, biochemical, and social conditions. Transition through puberty often begins with the development of external secondary sexual characteristics, which appear as breast enlargement and pubic hair growth in girls. Growth acceleration and peak height velocity occur early in puberty, whereas menarche, the onset of menstrual bleeding[1].

Menarche is actually the last stage in a complex series of biological developments related to puberty It marks an important point in life for the female adolescent, as it symbolizes the entrance into woman hood 5.Menarche is the first menstrual cycle or menstrual bleeding, in the female human; it is often considered as the central event of female puberty as it signals possibility of fertility[4].

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In females, menarche is the major landmark of puberty, which usually occurs between 13 and 18 years of age, despite regional and ethnical. Unlike other gradual pubertal changes, menarche signals a dramatic transition from girlhood to womanhood and is recognized as an important transitional point in women's lives .Although menstruation is a natural phenomenon, major psychological changes start with menarche[3].

## Objectives

l To assess the level of knowledge of adolescent girls among menarche and puberty

l To find out the association between the level of knowledge on menarche and puberty with selected variables like age, educational status, occupation, and income status .

## Research Methodology

Research approach used for the study was Non-experimental evaluative approach. The research design is descriptive research design was adopted for conducting the present study. The study was conducted at a selected village Kanchipuram District, Tamil Nadu with the population of adolescent girls, available in the age group of 13-18 years.The sample size was 50 and Non-probabality sampling technique was used to select the adolescent girls for conducting the study

Selection and Development of Study Instruments

It consisted of two sections.

1. Demographic data of the subjects

2. Structured questionnaires.

PART 1: Demographic variables

It consisted of demographic variables of adolescent girls such as Age, type of family, education, number of siblings, education about puberty

PART 2: Structured interview schedule on knowledge regarding puberal changes and menarche

It consisted of 14 objective type questions. Each question consisted of 4 options. This was framed to assess the level of knowledge on pubertal changes and menarche among adolescent girls

Scoring and Interpretation of the Tool

Structured questionnaires consist of 14 items. The total attainable score was 14. The cut off score was 8. Higher the cut off score indicates greater the knowledge level of pubertal changes and menarche

**Data Collection Procedure**

The data collection was done for one week at Selected village, Kanchipuram District, Tamil Nadu. Structured questionnaire was used to assess the knowledge level of pubertal changes and menarche. The researchers collected the demographic data and structured questionnaire (SQ) by conducting confidential data of the participants.

## Data Analysis

The data analysis was done using descriptive and inferential statistics. Descriptive statistics like frequency, percentage and mean. Chi-square test was used to find out the association between the pubertal changes and menarche with selected personal information sheet of the pubertal changes and menarche. Collected information on demographic data of pubertal changes and menarche among adolescent girls and Structured questionnaires (SQ) in the form of demographic data of adolescent girls. Descriptive and inferential statistical were used. The mean value is 207 and the standard deviation is 15.62

## Study Findings

Findings of the study were presented based on the objectives

Objective-I: To assess the existing level of knowledge on pubertal changes and menarche among adolescent girls.

Overall mean and SD of adult women related to knowledge aspects were calculated. Adequate knowledge level was 11%, moderate knowledge was 33%, inadequate knowledge level was 6%

From the above discussion, it showed that the mean scores and standard deviation of knowledge aspect has shown a significant difference in the pre test and post test scores.

Objectives II: To associate the existing level of knowledge on pubertal changes and menarche

The association between demographic variables in

relation with the knowledge aspects of adolescent girls, the findings show that there was no association between demographic variables such as age of adolescent girls, food pattern, educational status, total number of siblings, type of family and source of knowledge

## Conclusion

The number of adolescent girls having moderate knowledge were 33%, inadequate knowledge were 6% and adequate knowledge were 11% and overall mean in knowledge aspects of adolescent girls on pubertal changes and menarche SD of 15.62 . So, health care professionals must organize mass health education programmes about pubertal changes among adolescent gir

**Conflict of Interest:** Nil

**Sources of Fuding:** Self-Funding

**Ethical Clearence:** Chettinad Academy of Research and Education, Institutional Human Ethics Committee

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# For Effective, Earlier and Simplified Diagnosis of Retinopathy of Prematurity (RoP), a Probe through Digital Image Processing Algorithm in B-Scan

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## Abstract

Eyes are the most vital sensory organ, which stimulates light and helps us to visualize the colorful world around us. Its internal structure is extremely minute and complex with various layers and chambers present. Retina and its layers, is the most important part of an eye that helps in viewing the objects. In certain ailments, if retina gets affected, the vision becomes challenging and may even lead to permanent blindness. One of such vision threatening diseases, affecting the infants is Retinopathy of Prematurity (RoP). Here, various latest, authentic methodologies and tools used for the diagnosis and management of RoP are reviewed and a novel algorithm has been proposed to measure the percentage deviation of retinal health with respect to prior ultrasonic B scan image. Also, to classify the level or stage of RoP based on the location and severity noticed in the ultrasonic B scan images. The proposed architecture and design would be effective and simplified and enable the Ophthalmologists for earlier and accurate diagnosis of RoP in infants.

***Key words:*** *Retinopathy of Prematurity (RoP), Retinal health, Stage of RoP, Diadic transformation, Ultrasonic B scan images*

## Introduction

Sarvendriyanam Nayanam Pradhanam, means Of all senses, eye is the most vital says Ayurveda, which matches with the principles of modern medicine. It is the sensory organ that makes our life bright by stimulating the sense of vision. The anatomy of human eye is very minute and protected well by its own walls and structures. Out of all the eye structures, the retina which is situated at the dorsal side of the eye is responsible to receive the light and converts it into neural signals which are recognized by the brain. The lens situated at the anterior end focuses light on to the retina. In simple terms, the retina can be compared with an image capturing sensor in our latest day's digital cameras. The retina comprises of blood vessels, nerve fibers, rods and cones, etc which are distributed along the 10 different layers. As the retina plays a pivotal role in the image capturing and analysis, any variation in the structure and/or function of the retina and its layers may lead to complicated vision difficulties and may even cause blindness. The major diseases affecting the eye, especially the retina and its layers are generally termed as Retinopathy. Retinopathy of Prematurity (RoP) is one of the most common congenital disease affecting preterm babies and found challenging to prevent artificial blindness.

Retinopathy of Prematurity, formerly known as retrolental fibroplasia (RLF) is a progressive, vaso-proliferative, preventable disorder, chiefly observed in preterm new born infants (born within 30 weeks). The infants born with low birth weight (less than 1500gms) are also prone for getting affecting with RoP. The changes and the irregularities in the accumulation of blood vessels increase as an individual grow and may end up causing vision threatening abnormalities, if left untreated. Now-a-days, with advancements in the field of medicine and technology, the rate of survival of premature infants is increasing. Simultaneously, RoP has emerged as one of the primary causes of preventable childhood blindness.

However, the complications of the disorder like visual morbidity can be reduced or avoided with an

early, exact diagnosis followed by an efficient, timely treatment. The presence and prevalence of RoP, if any can be assessed by an Ophthalmologist by performing a simple screening test within a few weeks after the child's birth. With the advent of the latest non-invasive imaging techniques, the evaluation of RoP has become simpler. The plus disease in RoP is characterized by very severe vascular abnormalities, dilation of rational retinal blood vessels, tortuosity or diffusion of blood vessels, etc. The International Committee for RoP classification has stated that the earlier prognosis of RoP can be specifically analysed by identifying the demarcation line or ridge formation in the retinal blood vessels.

The observation of infants dilated pupil with an indirect ophthalmoscope, telescreening using RetCam digital imaging device, Ultrasound scan, Fundus imaging, etc are the most commonly used diagnostic tests for the study of RoP. A few of the latest treatment modalities include low weight gain proportion, WINROP algorithm, indirect laser photocoagulation, cryotherapy, etc.

## Materials

### Literature Survey and Outcomes:

In the cases of RoP, changes and irregularities in the accumulation of blood vessels increase as an individual grow and may end up causing vision threatening abnormalities, if left untreated. Now-a-days, with advancements in the field of bio-medical technology, the rate of survival of premature infants is increasing. Simultaneously, RoP has emerged as one of the primary causes of preventable childhood blindness. However, the complications of the disorder like visual morbidity can be reduced or avoided with an early, exact diagnosis followed by an efficient, timely treatment. The presence and prevalence of RoP, if any can be assessed by an Ophthalmologist by performing a simple screening test within a few weeks after the child's birth. With the advent of the latest non-invasive imaging techniques, the evaluation of RoP has become simpler. The plus disease in RoP is characterized by very severe vascular abnormalities, dilation of rational retinal blood vessels, tortuosity or diffusion of blood vessels, etc.

The amount of tortuosity is evaluated by formulating a One Dimensional Differential Geometrical Curvature Characterization Method. From the identified retinal images, vessel networks and their individual boundaries are extracted as planar curves. After segmentation, the computation of differential curvature is carried out at segment level and also at vessel level for distinctive vessels. The testing and validation of this method has been carried out on the accessible, local and public datasets and it has been observed that the blood vessels with appreciable amount of tortuosity have a notable variation in the curvature, on comparing with the normal blood vessels[1].

The retinal blood vessel system is analysed and a fully automated model is proposed based on morphological segmentation so that the available binary images help to analyse the blood vessel structure. The regions where the blood vessels are suppression are identified with better response to stimulus and strengthened segmentation that withstands changes in the environment with unfavourable image criterion. So, the data which is a set of 22 images obtained from RetCam 3, comprising the information about the vascular system are anticipated under a lesser contrast. Also, for this model, a comparison in testing and analysis are made with respect to selected segmentation methods, which depends on objective criteria[2].

Till now, most of the automatic or semiautomatic tools used to diagnose RoP have focused on assessing the Plus Disease, by identifying the vascular abnormalities in the retina. A few has focused on methodologies that help in identifying the stage of the disease. As the principles and tools used in Deep Neural Networks are proven to be efficient in computer vision, medical imaging, it has given a scope to design a system for an automatic diagnosis of RoP. In this work, the architecture of Convolutional Neural Networks has been proposed. For every examination, it features the identification of the presence of RoP and its severity, if it is present. By analyzing the severity and the progression of the disease, RoP cases are is classified as mild and severe cases. In this proposed architecture, a feature aggregate operator connects 2 sub-networks. From the fundus images, the sub network 1 extracts the high level features. Aggregator operator fuses the extracted features from various images and feeds as an input to the sub network 2, so that the class or stage can be anticipated. RetCam3 is used in imaging, training and evaluating the large data sets. This model is proven to be efficient in demonstrating the classification of RoP disease accurately[3].

A tool is proposed for easier diagnosis of stage of RoP and also to locate the affected region in the eye. The input images for this proposed tool are taken from RetCam and the output is represented as a reading on 1

to 9 scales. By analysing the same, the stage and zone of RoP can be ascertained. As this tool is easy to operate, nurses or paramedical staff need not depend on the specialist for assessment of the disease.[4]

In the cases of RoP, the growth and development of retinal blood vessels is cluttered or unsystematically arranged which would result in causing retinal scar or even retinal detachment in some extreme cases. The stage at which the disease has been diagnosed, the tortuosity index helps to assess the asperity of the disease. It is considered that higher the tortuosity index, greater the chances for the diagnosis of plus disease, which would lead to Aggressive Posterior RoP. Also, it is required to have an expertise in Retinopathy and Ophthalmology to diagnose the condition and assess the stage of the disease. As we lack this especially in the rural areas of the developing countries, a lot many children are left unnoticed till they become completely or partially blind. Keeping this end in view, if the gap between the patient and the specialist doctor is reduced, more number of children will be benefitted. Based on the individual's condition and essentiality, the appointments, treatment plans can be scheduled. More people would be made beneficial with this advancement in technology[5].

Plus disease in the case of RoP usually, an Ophthalmologist, who is specialised in retina related ailments does a clinical examination to the child and assess the parameters through a Fundus image. It represents the vascular structure of the eye, which can be compared with respect to the features of Gold Standard Image, which needs an expertise. In developing countries, most of the rural areas suffer from lack of specialist doctors, where computer aided systems help to diagnose the disease at the earliest. In this paper, Curvature based method has been developed to measure the delineation of retinal blood vessels using COSFIRE filters and calculation of tortuosity, which has found effective with 0.88 sensitivity and 0.94 specificity as a result on its observation of 35 set of images[6].

The effective segmentation followed by precise visualisation of retina's vascular curvature is important to understand the health of retina in infants suffering from RoP. But, in case of infants the fundus is of low contrast compared to adults, which makes the segmentation difficult by using, the available computer based retinal image analysers. To overcome this, the blood vessel networks can be fused by a guided filter and mathematical morphological techniques can be applied. The modified mathematical morphological closing operation which is being used in post processing technology helps to identify and analyse the thin and small blood vessels in the output after segmentation. The information and values extracted after segmentation helps in the earlier diagnosis of RoP7.

**Proposed Methodology & Instruments for Research:**

The ultrasonic B scan is considered as a diagnostic tool for the assessment of RoP condition. For this study the best quality images captured by Sonomed Escalon's, Master-Vu B-Scan (Model No: MV5600) are used. It is a portable devise, which can be connected to a PC, laptop and can be used as a bed side imaging system also. By activating the probe at different positions on the closed eyes, the miniscule anatomy of the eye can be visualized on the monitor inter-phased with the probe. The 12MHz frequency handheld, soft touch transducer probe sends the sonic waves with virtually no sound and captures the still images or continuous video clips which can be viewed as separate frames also. As it is sensitive even for smoother touches, more pressure need not be exerted while scanning. Hence, reduces the compression of cornea. Time varying gain control is adopted to trace out near, medium and far gain fields. While performing the brightness based B scan, the amplitude based A scan image can also be visualized simultaneously. Special tools are available for variable zoom, pan and selection of specific area, brightness and contrast control, on-screen annotation, etc. Sectoral scanning method is used where frame rate id 30 fps (max), and gray scale levels are 256. For an improved penetration, acoustic output can be adjusted by achieving the scan depth 0f 30-60mm. The possible electronic and clinical resolutios are 0.015mm (max) and 0.1mm respectively. The captured images are saved as .jpg or .bmp formats and video clips captured are saved as .wmv up to 100 frames. The precision in terms of distance and angle is 0.046mm and ½ degree respectively.

The software has a license to be installed in multiple computers or laptops and so, more number of ophthalmologists can use a single machine for easier screening. The database of every patient can be entered and saved separately, which enables patient's privacy protection. Its clinical accuracy is +-0.1mm, electrical accuracy is +-0.32mm, lens database is 1600 and an increment of lens calculation is in 0.25D. The formulas like Binkhorst, Regression II, Holladay, Hoffer Q,

Haigis, etc are available for the calculation of intraocular lens power. Latkany myopic regressions, latkany hyperopic formula, Aramberri Double K are used for post refractive IOL calculation.

**Sample B Scan Images:**

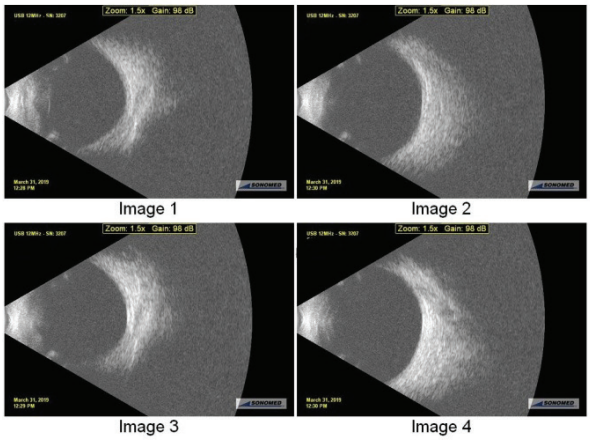


**Image A: A few hard Exudates are found in both OD & OS (Right & Left Eyes) respectively**

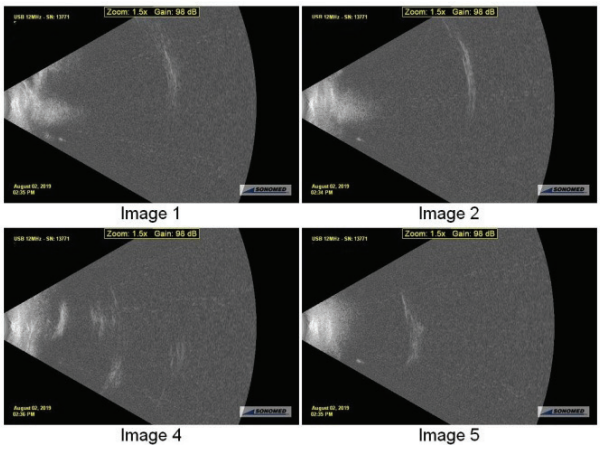


**Image B: The Retinal Structure is Not Formed Completely:**

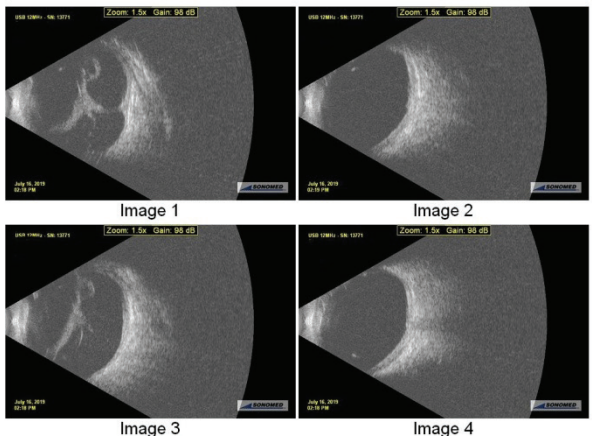


**Image C: Symptoms of Retinal Detachment are in OD (right eye) and OS (left eye) is almost norma**

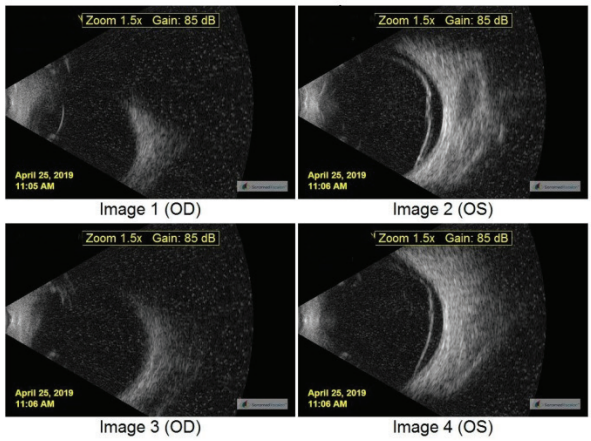


**Image D: Tractional retinal Detachment is noticed**

## Conclusion

The sample images are subjected to the morphologies in-line with algorithm proposed and found that it has a promising scope in attaining the accurate measurement of the percentage deviation of retinal health with respect to prior Ultrasonic B scan image and also to classify the level or stage of the RoP based on the location and severity noticed in the Ultrasonic B scan. The method would be implemented in real time application so that better diagnostic facility can be provided to infants. The Ophthalmic health of the future generation can be protected for a brighter society.

**Acknowledgement:** I would like to render my whole hearted gratitude and regards to the management, doctors, Optometry department and Clinical Research team of Sreedhareeyam Ayurvedic Research & Development Institute, Sreedhareeyam Ayurvedic Eye Hospital and Research Centre, Koothattukulam, Kerala for their constant support and providing me with the data and knowledge bank required as per the research needs. Also, my thankfulness to the Doctors and Members of Institutional Ethics Committee for their acceptance and valuable suggestions, enabling me in taking forward the research work, in-line with the current needs and trends of the society.

**Ethical Clearance:** The Ethical Clearance is approved by "Institutional Ethics Committee" of Sreedhareeyam Ayurvedic Research & Development Institute, Koothattukulam, Kerala on 23rd November 2019.

**Conflict of Interest:** The authors do not have any conflict of interest.

**Source of Funding:** There is no external agency

funding for this research. It is self-funding research.

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# Effect of Early Physiotherapy for Endotracheal Intubation Induced Temporomandibular Joint Dysfunction –Experimental Study

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## Abstract

**Objectives:** To determine the effect of early physiotherapy in endotracheal intubation induced temporomandibular joint dysfunction (TMD) and to compare the effect of Early Physiotherapy interventions and Conventional treatment (CT) in TMD in Endotracheal Extubated patients.

**Method:** An experimental study was carried out in 40 endotracheal extubated subjects diagnosed with TMD. The subjects were random allocated to Group A as Experimental group receiving early physiotherapy and Group B as Conventional group receiving routine treatment for 14 days. The outcome measures used were American Academy of Orofacial Pain(AAOP) Questionnaire, Visual Analogue Scale (VAS), Physical Assessment tool, Range of motion of TMJ, Tenderness over oro-facial muscles.

**Results:** The Results obtained shows that both the groups showed significant improvement in the outcome variables and therefore aids with early correction of dysfunction.Within Group Analysis showed statistically more significant improvement in all outcome measures for group A .VAS ($p < 0.0001$), ROM for all 4 motions ($p<0.0001$), Auscultation test=95% improvement. Provocation test =95% improvement, Tenderness =95%. However only,AAOP Questionnaire was not significant for group B (p value>0.001).

**Conclusion:** We found that those early physiotherapy interventions showed significant improvement in the outcome variables concluding that it improves TMJ mobility and reduces pain. It can be further concluded that conventional treatment can be more efficacious if combined with early physiotherapy interventions.

***Key words:*** *Temporomandibular Joint Dysfunction, physiotherapy, endotracheal intubation, orofacial pain.*

## Introduction

Temporomandibular Dysfunction (TMD) is a group of orofacial disorders affecting Temporomandibular joint (TMJ), and its associated structures[1] TMD has multi-factorial etiologies [2]. One of the etiological factors suggested as contributing to TMD is micro-trauma including forceful intubation [3].

In Emergency settings sometimes endotracheal intubation (ETI) is performed by resident doctors and Nurses. ETI induced micro-trauma has been proved a predisposing factor for TMD in few published case reports and systematic review articles. During this maneuver, anaestheologist attempts rotation and translation of the TMJ. ETI in the ICU is a potentially hazardous procedure, most commonly due to failing oxygenation and unstable hemodynamics during emergency intubations [4]. During this technique, harm may occur to the TMJ apparatus due to greater forces being applied either with laryngoscope, or manually

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in process of completion of intubation. Complications noted in the cited case reports and studies include brief or permanent jaw locking, disc dislocation, muscle pain and facial pain [3]. Though little studied, the deleterious effect of ETI on TMJ dysfunction is largely established [3]. Difficult Airway society Guidelines states 5 to 10% prevalence of TMD post extubation.

Noninvasive managements prove to be the first option for 85 to 90% of TMD patients. [5]. Systematic reviews and meta-analysis produce evidence that physiotherapy interventions are more beneficial than other treatment modalities in the management of TMD for pain reduction and improving ROM. Large scale superior quality experimental studies with a standard management protocol are desired to establish whether physiotherapy is actual and has potent therapeutic value in management of TMD. However there are no studies that reported interventions with Early Physiotherapy Intervention EPI for ETI induced TMD [5].

## Method

After approval of Institutional Ethics committee this experimental study was conducted in Krishna Hospital, Karad. The primary objective of this study was to find effect of early physiotherapy interventions on temperomandibular Joint dysfunction in endotracheal extubated patients. The samples were 40 endotracheal extubated (ETE) patients in which ETI was done by Resident doctors and Nurses. Both genders, age 20 to 50 years, diagnosed with TMD in screening session were included in the study. it was using American academy of orofacial pain questionnaire and detailed physical Assessment.According to the inclusion criteria, ETE who were intubated after abdominal surgery, Cardiac Surgeries and for airway diseases (ARDS, Pneumonia) were selected. No specific duration of ETI was taken into the consideration. In all selected samples ETI duration was ranged between 3 to 15 days. Patients with head neck surgeries, neurological surgeries, tracheostomy and laryngeal mask were excluded. The patients who showed maximum positive responses for the assessment were selected.ETE patients having TMD deficits on screening were randomly allocated by using random allocation software into two groups. Group A was experimental and Group B was conventional (CT). Both Group A and Group B had 20 subjects each. Group A received a set interventional treatment protocol for 14 days. Group B was given conventional treatment including routine chest physiotherapy, medical and nursing care. Both the groups received physiotherapy under observation of concern intensive care and ward physician. Between groups comparison was done by applying 'UnPaired t-test' to pre and post treatment values of both group for all outcome measures.

**Table1: Socio demographic data of the Subjects (Endotracheal extubated patients) participated in the study. (n=40)**

| **Variables** | **Frequency(n)** | **Percentage (%)** |
|---|---|---|
| Gender | | |
| Female | 30 | 75% |
| Male | 10 | 25% |
| Variables | Group A (Mean) | Group B(Mean) |
| Age | | |
| 21-30 | 26.25(2) | 25.50(2) |
| 31-40 | 33.55(4) | 34.55(3) |
| 41-50 | 41.40(4) | 40.60(5) |
| Illness | | |
| OP Poising | 5 | 4 |
| Pneumonia | 7 | 8 |

***Cont...*** **Table1: Socio demographic data of the Subjects (Endotracheal extubated patients) participated in the study. (n=40)**

| | | |
|---|---|---|
| Abdominal S. | 3 | 4 |
| Bronchitis | 3 | 2 |
| ARDS | 2 | 2 |
| Type of Intubation | Frequency | Percentage |
| Elective | 10 | 75% |
| Emergency | 30 | 25% |

Group A : Early Physiotherapy Intervention[5-9].

**1. Maximum Protection Phase:(0-7 Days) Pain Management**

| | |
|---|---|
| Day 1 | Patient and Relative Education. [5] Diaphragmatic Breathing Program.[5] |
| Day 2-3 | 1) Kinesiotape: V-shape extended to inferior border of jaw muscles and to anterolateral aspect of neck.[8] 2) Cryotherapy: Crushed ice wrapped in towel .Circular Pattern. 2 to 4 times a day. Maximum 8 times to minimum once a day. 10 to 15 min ideal duration.[7] 3)Soft Tissue Techniques: Extra oral Massage: Intra Oral Trigger Point Release[6] |
| Day 4-5 | 1) Patient education (Tentative Removal of Ryles Tube).[5] 2)Electrophysiological Modalities: Ultrasound: Dosage: Continuous at a frequency of 1Mhz and intensity of 1.0-1.25 W/cm for 3 mins over TMJ.[8]3) Soft Tissue Mobilization: For temporalis, masseter, medial pterygoids, and lateral pterygoids muscles. Can be done using one digit or multiple digits to contact myofascial trigger points. Can be applied unilaterally or bilaterally.[6] |
| Day 6-7 | 1)control of Jaw Muscles and Joint Proprioception: Recognition of resting position of the jaw. Teach controlled opening and closing of jaw. Mirror for reinforcement.[7]<br>2)Stretching Techniques: Passive stretching: Placing layered tongue depressors between central incisors, and then gradually work to increase the amount of layers far enough to insert the knuckles of index and middle fingers.[8] |

2. Moderate Protection Phase (8 to 10 days). To increase Restricted Range of Motion.

| | |
|---|---|
| Day 8-10 | 1) Joint Manipulation Techniques. Unilateral Distractions. Bilateral Distractions. Anterior Glide. Medial and Lateral Glide. Dosage: 1 to 3 sets of 10 reps. [6]<br>2) Active Exercise Program. Tongue position at rest. Teeth Apart. Nasal Diaphragmatic breathing. Tongue up and wiggle. Strengthening. Touch and Bite.(Proprioceptive re-education) Neuromuscular Control. Isometric Exercises.[5] |

3. Minimum Protection Phase (11 to 14 days).

Aim: Strengthening.

Day 11-14 1) Resistive Exercises.[7] 2)Proprioceptive Neuromuscular Facilitation .[7]

Group B: Conventional Treatment [5].

Medical, Nursing care and Chest Physiotherapy.

**Results:** . A total of 100 ETE patients fulfilling the inclusion criteria were screened by anesthetist and physiotherapist . 52 patients were found to be diagnosed with TMD. Out of which 6 did not agree to participate, 4

on discharge terminated the treatment and 2 had severe complications. Remaining patients were found majorly to present with atleast one sign or symptom of TMD. The patients who showed maximum positive responses for the assessment were selected.

Between the group comparison.

A) AAOP Questionnaire (Between the group)

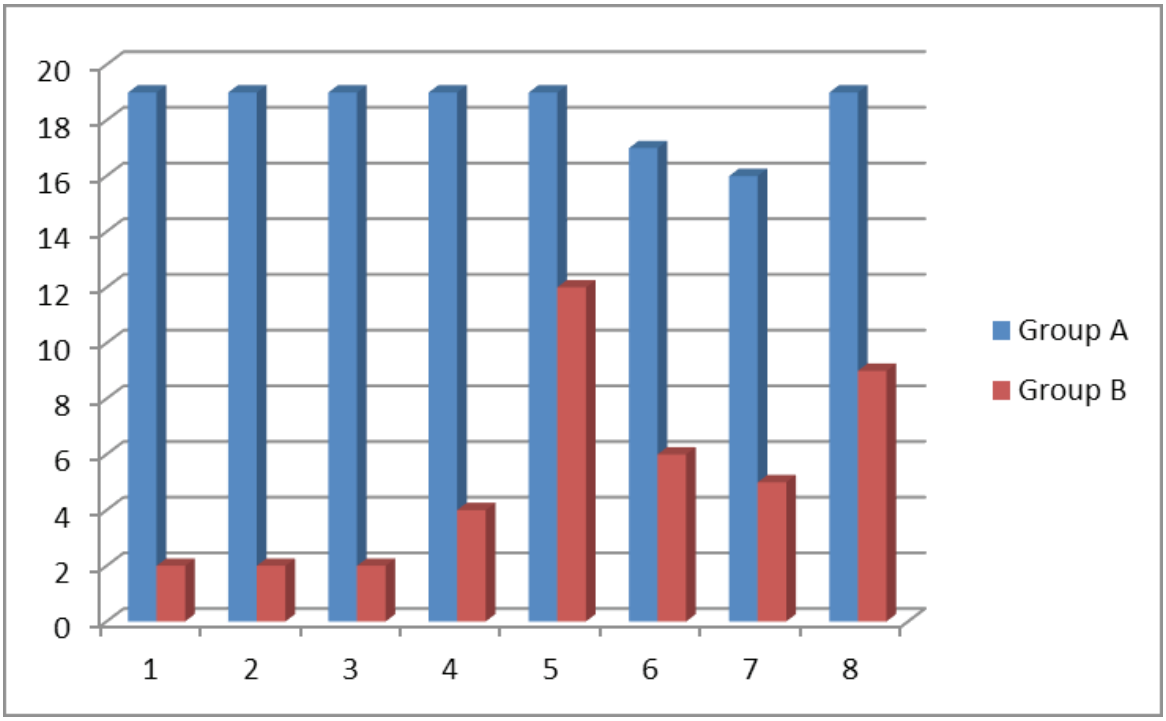


**Figure no.1 The Between group comparison of AAOP Questionnaire .**

Interpretation: The above Graph shows comparison between the groups. The graph shows difference in the post training values between the group. AAOP questionnaire showed significant association between pre treatment and post treatment answers in both groups. Association between Pre and Post signs and symptoms of TMD in Group A =p value<0.0001 proved statistically significant. Group B =p value>0.0001 proved statistically non-significant.

B) Visual Analogue Scale (On Activity)

Table 2: Between the group comparison- VAS (On Activity) according to the p values.

| **Group** | **Group A** | **Group B** | **t value** | **p value** | **Significant** |
|---|---|---|---|---|---|
| Pre training | 3.35±1.46 | 3.50±1.27 | 0.345 | 0.731 | Not Significant |
| Post training | 0.80±0.83 | 1.95±1.19 | 3.538 | 0.0011 | Very Significant |

C) TMJ goniometry

Table 3: Between the group comparison- Goniometric Measurements,

| **PARAMETERS (PRE)** | **t value** | **p value** | **Remarks** |
|---|---|---|---|
| Mouth Opening | 1.04 | 0.305 | Not significant |
| Left Lateral Movt | 0.558 | 0.305 | Not significant |
| Right Lateral Movt | 0.941 | 0.352 | Not significant |
| Protrusion | 1.83 | 0.073 | Not significant |
| PARAMETERS (POST) | t value | p value | Remarks |
| Mouth Opening | 6.35 | 0.093 | Significant |
| Left Lateral Movt | 4.28 | 0.093 | Significant |
| Right Lateral Movt | 4.76 | 0.481 | Significant |
| Protrusion | 7.88 | 0.628 | Significant |
| PARAMETER(POST) | | GROUP A | GROUP B |
| Mouth Opening | | 41.5±3.3 | 34.8±3.36 |
| Left Lateral Movt | | 8.9±0.64 | 7.8±0.95 |
| Right Lateral Movt | | 8.45±0.75 | 7.2±0.89 |
| Protrusion | | 6.95±0.51 | 8.3±0.57 |

D)Tenderness:

Table 4: Between the group comparison- Tenderness in different Muscle Groups

| | **POST** | | **POST** | |
|---|---|---|---|---|
| | **YES** | **NO** | **YES** | **NO** |
| Temporalis | 1 | 19 | 5 | 15 |
| Masseter | 1 | 19 | 8 | 12 |
| Medial Pterygoids | 1 | 19 | 9 | 11 |
| Lateral Pterygoids | 1 | 19 | 16 | 4 |

Physical assessment which includes VAS, Tenderness, Ascultation provocation test also showed similar results. Goniometric measurements showed significant improvement in both. Mouth opening was the most improved

parameter noted in Group A with mean value 41.4 mm. VAS showed statistically significant improvement with reduction in pain levels with p value <0.001.Group A showed reduction in pain with mean value of 3.35 ±1.46 to 0.80±0.83 . Group B showed reduction in pain levels with mean value of 3.50 ±1.27 to 1.95±1.19. Auscultation and provocation test showed improvements in both groups. Group A showed significant results in both with 95 % improvement .Group B showed a relatively less improvement with 80 % and 75% respectively. Group A showed 95% improvement in tenderness reduction in all muscle groups. The results for group B were 75%, 60%, 55%, 20% improvement in tenderness at masseter, temporalis, medial and lateral pterygoids respectively.

## Discussion

In general the major goal of this study was to correct ETI induced TMD by improving functional TMJ mobility and relief of pain. Both groups were effective in correction of TMD, EPI proved more efficacious. In the present study it was found that majority of subjects experienced pain and tenderness. Also present study signifies that ROM, pain, tenderness showed combined improvement which interprets the fact that muscle hyperactivity might be cause of dysfunction post extubation. In course of treatment, patients experienced a significant reduction in intensity of pain in both groups. In a previous study by David Smekal it was found that, occurrence of TMD is common with stomatological treatment in which the mouth is in widened position. The same study concluded early treatment not only corrects disturbances but helps prevents further worsoning and chronicity. Previous studies propose ETI as a risk factor for TMD. Previous studies state in individuals with a report of prior symptoms, there is an increased reporting of symptoms which continues for as long as 2 weeks post operatively [3].

Female Gender (75%), increasing age (50%) and emergency ETI (75%) are predisposing factors for transient TMD pain following ETI. In a case report, Michael D. Martin found similar predisposing factors for occurrence of TMD post extubation.[3] In a study by C.B. Battistella Muscle related conditions encompass largest subtype among various disorders grouped under TMD [5].Presence of Masticatory muscle tenderness is found to be more in age group of 31-50 years and more among females. The most frequent trigger points were found in temporalis, followed by masseter, medial and lateral pterygoids. Considering the critical condition of the patients after surgery, AAOP questionnaire proved to be more feasible. More affirmative answers were found for questions 4,5,6,7 for both groups which support the results of myogenic subtype been more prevalent owing to nature of the questions [3] .Question 4 resulted in positive findings, regarding presence of joint noises. Statistically significant improvement was noted in reduction of sounds in both groups with 95 % and 80 %. Limitation of mouth opening on pre treatment was found in both groups (<30mm).In previous studies a limited mouth opening of <40 mmm was noted. The smaller improvements in group B can be attributed to findings in previous study, interincisal distance assessment was related with pain at 7 day, but association at 14 days was not significant [3].

Treatment protocol was in various phases and used symptom specific approach which is lacking in group B which might be a responsible factor for more marked improvement in group A. Additionally there is no published study that specifically focuses on treating TMD with EPI alone in ETE patients. Also, some studies state using more treatment modalities simultaneously prove more efficacious.Clinical profits of physiotherapy management are widely described both in literature and TMD textbooks. Although it is generally believed that these treatments are effective in reducing pain and restricted function, with a short term efficacy, any physiotherapy treatment is better than no treatment. In last few years, several studies have demonstrated different results regarding the effect of Physiotherapy treatments in management of TMD. Early physiotherapy interventions are a valuable treatment option. Treatments which are easily accessible, low cost effective and reversible should be given priority [11]. Evidences for application of carefully controlled therapeutic exercise program for chronic joint disorders like Rheumatoid arthritis are also well established[12].However, only a few studies have investigated its effectiveness for treating dysfunction post stomatological treatments. Additionally there is no published study that specifically focuses on treating TMD with early physiotherapy interventions alone in endotracheal extubated patients. This study has addressed this gap of knowledge and has contributed to the evidence that early physiotherapy interventions may also be an additional asset for improving dysfunction in endotracheal extubated patients.

This study has some limitations. In particular some limitations are due to small sample size. Moreover, future studies should evaluate a longer follow up time and also

compare the study value in different stomatological treatments (molar tooth extractions, orthodontic interventions, dental implants). Furthermore, we also suggest the addition of supplementary interventional methods to get a more comprehensive knowledge and improve efficacy level of the study.

Conclusion: We found that EPI showed significant improvement in TMJ mobility and orofacial pain relief.

Acknowledgment: We acknowledge the guidance of Dr. P.B. Jamale, MD, Anesthesia, and constant support of Dean, Faculty of Physiotherapy, KIMSDU Karad, Dr. Sandeep Shinde, and Dr. Kakade SV, for help in statistical analysis.

Conflicts of interest: The authors declare that there are no conflicts of interest concerning the content of the present study.

Funding source: This study was funded by Krishna Institute Of Medical Sciences Deemed To Be University Karad, Maharashtra

Ethical clearance- Taken from institutional ethical committee of Krishna Institute Of Medical Sciences Deemed To Be University Karad, Maharashtra

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# An Observational Study on the Sexual Assault Victims in the Year 2018 at Tartiary Health Care Center of Rajasthan

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## Abstract

**Introduction:-**Sexual assaults are inhuman crimes against individual as well as the whole society. This study was thus initiated to obtain statistical pattern of sexual assaults pertaining to analyze various aspects including socio-demography and victim assailant relation, other relevant factors.

**Materials and Method:-**

**Inclusion Criteria :**-all the victims/sexual offence survivors examined at SMS Medical College, Jaipur during 1st January 2018 to 31st December 2018

**Exclusion Criteria:-** all the alleged cases of sexual offence whom consent could not be obtained.

**Results:-** total 60 cases were studied. The mean age of the victims in present study was 20.98 years. 73.33% victims were from urban regions. 50% victims were educated. 70% victims in the present study were married. Most common place of commission of the crime was the victim's own home (46.67%) . 43.34% victims reported within one week time period from the incidence. 88.33% victims were assaulted by a single person. 76.67% victims were assaulted by familiar persons. In 51.67% cases, the victim had been assaulted multiple times. In 85% cases, there was peno-vaginal intercourse. 71.67% cases had no injury in the present study. 3.33% victims got pregnant after the sexual assault.

**Conclusion:-** Females of reproductive age group were the most common victims in the present study. Familiar persons committed the crime in most cases and victim's home was the most common site of occurrence. There was delayed reporting of the crime in most cases which was the main reason for loss of vital trace evidences.

**Suggestions:-** Strict adherence to protocols for medical examination of victims of sexual assaults should be mandatory. Sex education should be provided to school students of teenage to increase awareness regarding medical and legal issues related to such events to increase the reporting of this crime.

***Key Words:-*** *sexual offences, Hymen, victim, accused, POCSO.*

## Introduction

Sexual assaults are inhuman crimes directed against individual as well as the whole society1. Sexual offence may be associated with physical violence also2. No age or gender stands bar to this crime3. Rape is usually under-reported crime experienced by women in all sections of the society and obtaining an accurate measurement of sexual assault is a challenge4. Sexual assault, a form of sexual violence, often used synonymously with rape, could include anything from touching another person's body in a sexual way without the person's consent to forced sexual intercourse - oral and anal sexual acts, child molestation, fondling and attempted rape. The Prevention of children against sexual offences act (POCSO ACT, 2012)5,6 has been added as well as

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section 375 IPC and 376 IPC amendments have been done to combat any form of sexual intentions directed against children and females irrespective of gender. Multidisciplinary approach is required for investigation of these cases7

This study was thus initiated to observe the pattern of sexual assaults pertaining to analyze all aspects including socio-demography and victim assailant relation, other relevant factors and further recommendations.

## Materials and Method

1. Total 68 victims of sexual assault reported at Department of Forensic Medicine, SMS Medical College and attached Hospitals, Jaipur included as Hospital Based observational study universe

2. 60 Victims of sexual assault/ relatives who consented were included for study. Out of them there were 53 survivors and 07 non survivor victims who suffered fatal injuries in the incident.

3. Only two male victims of sexual offence were reported at SMS hospital during the study period (03.33%), The number of female victims among study group population have been reported to be 96.66%

4. All the cases were interviewed on socio demographic profile and relevant factors according to the proposed Proforma. The medico-legal examination for bodily injuries and genital examination for rape was conducted along with the doctors preparing the medico-legal reports.

5. Continuous variables were summarized as mean and standard deviation whereas nominal/categorical variables as proportion. Chi-square test was used for analysis of nominal categorical variables. Statistical analysis was conducted using Medcalc 16.4 versions software

## Observations

1. Out of 60 total case 44 victims(73.33%) were from urban region and rest 26.67% victims from rural status. the majority of victims were unmarried being 70% and married being 30%. majority of victims (50%) were adequately educated, secondary or higher as per their age & Only 25% victims (15 out of 60) were educated below secondary education and 25% of them totally illiterate. Majority of victims in the present study were students (35%) followed by housewives (23.34%). hymen was recently torn in 15% cases and old insignificant tears in 65% cases. The hymen was intact in 13.33% cases. The total number of cases with ruptured hymen was 80% .Two cases of sexual assault got pregnant after the assault (03.33%) .

2. In 85% cases in the present study natural sexual intercourse offence was committed whereas there were 08.33% cases of unnatural sex booked under Section 377 of the Indian Penal Code, 1860 (peno-oral sex in 03.33% cases and peno-anal sex in 5% cases). In rest 6.67% cases there had occurred touching, fingering etc. to the external genitalia.

**Table : 1: Distribution of Victims according to Age and Gender**

| Age Group (Years) | Male | Female | Total (%) |
|---|---|---|---|
| 0-5 | 0 | 05 | 05 (08.33%) |
| 6-<18 | 02 | 20 | 22 (36.67%) |
| 18-49 | 0 | 31 | 31(51.67%) |
| > 50 | 0 | 02 | 02 (03.33%) |
| Total (%) | 02 (03.33%) | 58 (96.67%) | 60 (100%) |

**Table 2: Alleged place of incidence of sexual assault**

| **Alleged place of incidence** | **Total (%)** |
|---|---|
| Home | 28 (46.67%) |
| Neighborhood | 12 (20%) |
| Hotel | 05 (08.33%) |
| Home of assailant | 05 (08.33%) |
| Unknown | 03 (05%) |
| Office/ factory | 02 (03.33%) |
| Fields | 02 (03.33%) |
| Variable Multiple | 02 (03.33%) |
| School | 01 (01.68%) |
| Total | 60 (100%) |

**Table 3: TIME Gap between incidence of sexual assault and Medico-legal examination**

| **Time Period** | **Total (%)** |
|---|---|
| Same day | 03 (05.00%) |
| 2nd day | 09 (15.00%) |
| 3rd day | 05 (08.33%) |
| 4th day | 02 (03.33%) |
| 5th-7th day | 07 (11.67%) |
| 1-4 week | 05 (08.33%) |
| 1-6 month | 14 (23.34%) |
| >6 month | 15 (25.00%) |
| Total | 60 (100%) |

**Table 4: Distribution of cases of sexual assault according to number of Assailants**

| **Number of Assailants** | **Total (%)** |
|---|---|
| One | 53 (88.33%) |
| Two | 03 (05%) |
| Three | 04 (06.67%) |
| Total | 60 (100%) |

**Table 5: Relation between victims and the Assailant**

| Relation to Assailants | Total (%) |
|---|---|
| Neighbor | 16 (26.67%) |
| Stranger | 14 (23.34%) |
| Close Friend | 08 (13.33%) |
| Co-worker or Senior at Job | 08 (13.33%) |
| In Law relatives | 05 (08.33%) |
| Relative or Friend of Relative | 04 (06.67%) |
| Husband | 03 (05%) |
| Father or Paternal Uncle | 02 (03.33%) |
| Total | 60 (100%) |

**Table 6: Distribution of cases of sexual assault according to the presence or absence of Genital and/ or Bodily injuries**

| Sn | Genital Injuries | | Bodily Injuries | | Total |
|---|---|---|---|---|---|
| | Present | Absent | Present | Absent | |
| 1 | | YES | | YES | 46 (76.67%) |
| 2 | | YES | YES | | 8 (8.33%) |
| 3 | YES | | | YES | 3 (5%) |
| 4 | YES | | YES | | 9 (15%) |

## Discussion

1. Female out-proportionate the male in number as victim of sexual offences. The mean age of the victims in present study was 20.98 years. Majority of the victims in the present study were between 18 to 49 years of age (51.67%) followed by 6 to 18 years of age (31.67%). There were 08.33% victims who were less than five years of age.

2. 46.67% victims were sexually assaulted in their own homes in the present study followed by next 20% sexual assaults in neighborhood. Other common sites of occurrence of these crimes were hotels (08.33%) followed by fields and offices (03.33% each); and, in 5% cases the place of assault remained undetermined owing to drugging of the victim or death of victim.

3. In the present study, only 5% victims had reported the crime on the same day. Another 15% had reported on second day, 08.33% on third day and rest 15% between fourth to seventh days.

4. In 88.33% cases the victims had been assaulted by a single offender. In five percent cases there were two assailants and rest 6.67% cases were gang rape cases. Seven victims were killed after the episode of sexual assault (11.67%). 76.67% victims knew their assailants in the present study and 23.33% victims were assaulted by strangers. Amongst the known offenders, neighbors were the most common assailants (34.78%) followed by close friends and coworkers (13.33% each). Relatives or their acquaintances comprised the remaining 30.44% cases

5. In 41.66% cases the crime had occurred only once and was reported. 51.67% victims suffered multiple times before reporting the crime.

6. In the present study, there was no injury at all in 71.67% cases. There were isolated bodily (extra-genital) injuries in 08.33% cases and isolated genital injuries in 5% cases. 15% victims had both genital as well as extra genital injuries.

## Conclusion

Sexual violence against women and children is a major public health issue. Females of reproductive age group were the most common victims in the present study. Most commonly affected ages were 17 and 22 years.

Familiar persons committed the crime in most cases and victim's home was the most common site of occurrence.

In majority of cases, there was no evidence of forceful sexual intercourse but still opinion of penetrative sexual assault was concluded in 45% cases.

There was delayed reporting of the crime in most cases which was the main reason for loss of vital trace evidences. This is also indicative of underreporting of this crime owing to social stigma.

Strict adherence to protocols for medical examination of victims of sexual assaults should be mandatory along with the development of a referral system to with fully equipped expert medico-legal teams for examination. sex education should be provided to school students of teenage to increase awareness regarding medical and legal issues related to such events to increase the reporting of this crime.

Suggestions:-

- DES prophylactic therapy as post coital drug should be adviced1

**Acknowledgement:** Nil

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance :** Ethical clearance for the study was obtained from Institute Ethics Committee SMS Medical College, and Attached group of Hospitals, Jaipur

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# Mob Lynching: A New Form of Hate Crime

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## Abstract

Lynching is a form of extrajudicial execution by hanging carried out by mob, which is functioning independently of local police and law enforcement authorities. Indian also faced Indian WhatsApp lynching, which are a spate of Mob-related violence and killing following the spread of rumours, primarily relating to child-abduction and organ harvesting, via the WhatsApp message service. They fall under the category of organised hate crimes. According to the source from internet, it has been observed a rise in mob lynching cases related to cow vigilantism by over 10%. It is important to note that India does not have one comprehensive parliamentary law on mob lynching. Strong provisions of law and speedy convictions in mob lynching cases will act as deterrence for the society.

***Keywords:*** *Lynch, WhatsApp lynching, cow vigilantism, child lifters*

## Introduction

The origin of the word "lynch" are obscure, but it likely originated during the American Revolution. The verb comes from the phrase "Lynch Law" a term for a punishment without trial. Two Americans during this era are generally credited for coining the phrase: Charles Lynch and William Lynch. [1]

Lynching is a form of extrajudicial execution by hanging carried out by mob, which is functioning independently of local police and law enforcement authorities.[2] However, now a days it has become a wider term and may be defined as an act or a series of act by a group of people which forms an unlawful assembly, takes law in their own hands and commit crime against an individual or a group of individual to impose their own extra judicial punishments. In India lynching reflects, internal tensions between ethnic communities, communities sometimes lynch accused or suspicious convicts. There have been numerous lynching in relation to cow vigilante violence in India since 2014 mainly involving Hindu mobs lynching Indian Muslims and Dalits.[1]

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Indian also faced Indian WhatsApp lynching, which are a spate of Mob-related violence and killing following the spread of rumours, primarily relating to child-abduction and organ harvesting, via the WhatsApp message service.

Mob violence, vigilant justice and outbreaks of mass panics have a long history in India, but they have tended to be localized events. What differentiates the Indian WhatsApp lynching of 2017-2018 is that social media has enabled acts of violence to be filmed and shared across the country in such a way to build upon and perpetuate an atmosphere of fear and misinformation that instigate further violence in unconnected locations. For example, video of a lynching in Karnataka has been linked to a spate of violent lynching in Maharashtra.[3]

What is lynching?

Lynching is a type of non-justifiable homicidal hanging. It is difficult for a single assailant to carry it out. Lynching is an extrajudicial execution carried out by a mob by hanging without a fair trial.[4]

They fall under the category of organised hate crimes. Now-a-days it has got a wider meaning and also

includes acts of violence by a mob against a person or a group of people whom they suspect of having done an act which the group of people do not approve it. In this process they take law in their own hands and do not wait for a fair trial to be conducted.

Causes of Mob Lynching in INDIA

- Rise of cow vigilante
- Silence of political class
- Rumours of child lifters [5]
- For personal enmity
- In cases of sexual violence

What the statistics say:

**TABLE: 1: Cow related violence in India [source: internet]**

| Year | Incidents | Victims | Death | Major assaults | Minor injuries | Gender | |
|---|---|---|---|---|---|---|---|
| | | | | | | M | F |
| 2012 | 1 | 2 | 0 | 0 | 2 | 100% | |
| 2013 | 2 | 1 | 0 | 0 | 1 | N/A | N/A |
| 2014 | 3 | 11 | 0 | 11 | 0 | 100% | |
| 2015 | 13 | 49 | 11 | 34 | 4 | 95% | 5% |
| 2016 | 30 | 67 | 9 | 40 | 18 | 75% | 14% |
| 2017 | 43 | 108 | 13 | 64 | 31 | 85% | 9% |
| 2018 | 31 | 57 | 13 | 17 | 27 | 93% | 3% |
| 2019 | 10 | 45 | 4 | 14 | 27 | 88% | 13% |

**Cases:**

A software professional from Hyderabad was lynched while three of his friends including a Qatar national were thrashed by a mob which suspected them to be child-kidnappers, at Kamalnagar in Bidar district of Karnataka.

The victim was a 32 year male, who is married and has a two-year-old son. He was an employee of Google in Gachibowli and was a resident of Errakunta on the outskirts. According to his family members, he and his friends including the Qatar national had gone to Murki village in Bidar to attend a function at a friend's place. The group was travelling in a car and stopped near a government school for a break in the Kamalnagar police station area.

"one of them had brought chocolates from Qatar and offered them to some children who were coming out of the school. Villagers who saw this tried to catch them but the group noticed them and tried to flee. They were stopped by a mob at another village and assaulted," victim's younger brother said.[6]

Muslim man was attacked by a mob in Kharsawan district of Jharkhand on the suspicion of theft on June 18. He was beaten up mercilessly for over 18 hours before being handed over to the police. He succumbed to his injuries at a local hospital on June 22. The victim has been identified as 24-year-old male. Several videos of the Jharkhand mob lynching have gone viral since the incident. In one of the videos, a man is seen hitting the victim with a wooden stick as the latter begs him to let

him go. Another video showed the victim being forced to chant "Jai Shri Ram" and "Jai Hanuman".

On the night of June 18, he left his village for Jamshedpur with two men. Aurungzeb Ansari, a Jharkhand-based activist, has claimed that the victim was unaware where the two men were taking him. Ansari told HuffPost India that the victim was manipulated to go with them. While the two men fled the crime scene, the mob caught the victim and started beating him up. "Ghar mein ghusega [You will enter the house?]," one of the men is heard asking the victim. The victim is, however, heard denying the charges and said that the two other men did and he was asked to wait near the motorcycle. "I did not know anything," he said. Towards the end of one of the videos, one of the men asks him to chant "Jai Shri Ram" and "Jai Hanuman".[7]

2016 Jharkhand mob lynching refers to the case of lynching of two Muslim cattle traders by allegedly Cattle-Protection Vigilantes in Balumath forests in Latehar district in Jharkhand on 18 March 2016. The attackers killed 32 years old man and 12 years old boy who were found hanging from a tree. According to Jharkhand police, preliminary investigation revealed that the two were on their way to a cattle market in Chatra district. They had at least eight oxen with them, which they intended to sell. They were reportedly caught by a group of people in the early hours, beaten to death and hanged. According to villagers, there were communal clashes over beef eating in the area three months ago. Police stated the murder was aimed at looting money and cattle. Police arrested 5 people and are looking for three others, also said to be involved in the murders. One of the accused has links to a local Gau Raksha Samiti (an outfit for protection of cows). [8]

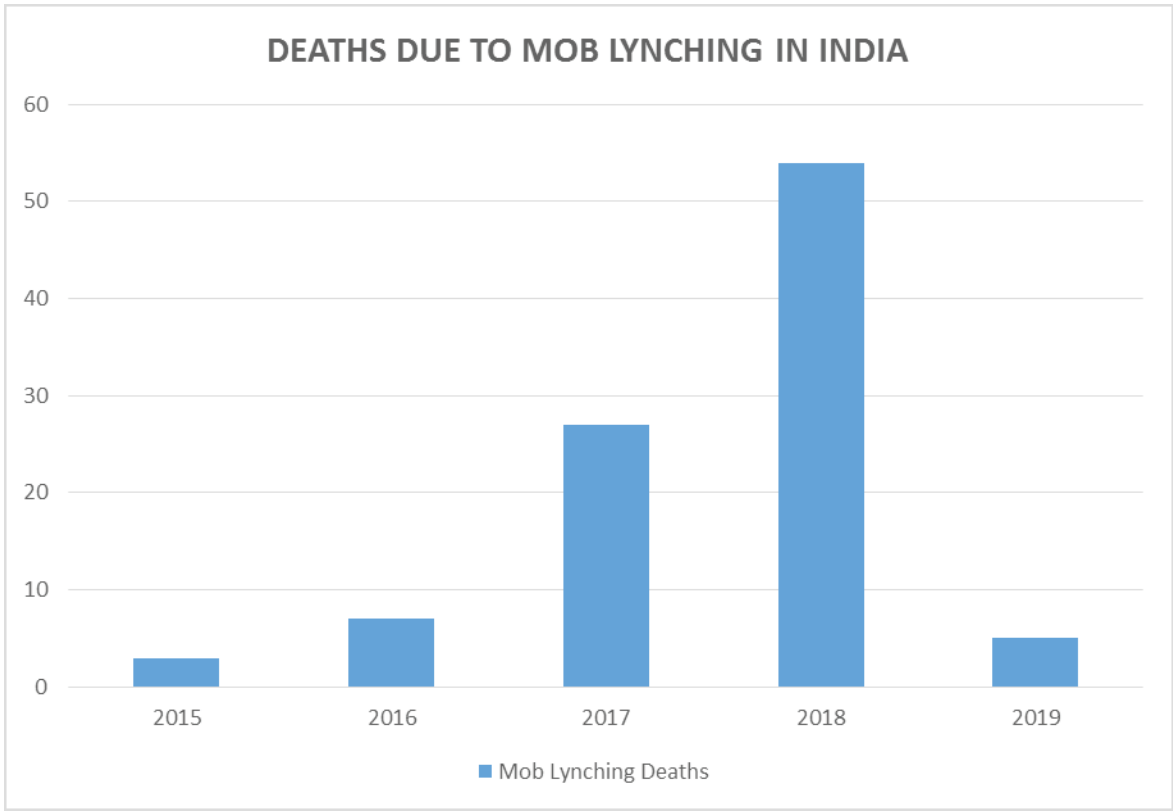


**FIGURE: 1; Source: Google Images**

Laws on mob lynching:

Laws that already exist and may aid in the lynching cases

CrPC 129: Any Executive Magistrate or office in charge of a police station or, in the absence of such officer

in charge, any police officer, not below the rank of a sub-inspector, may command any unlawful assembly, or any assembly of five or more persons likely to cause a disturbance of the public peace, to disperse; and it shall thereupon be the duty of the members of such assembly to disperse accordingly.

If, upon being so commanded, any such assembly does not disperse, or if, without being so commanded, it conducts itself in such a manner as to show a determination, not to disperse, any Executive Magistrate or police officer referred to in Sub-Section (1), may proceed to disperse such assembly by force, , for the purpose of dispersing such assembly, and, if necessary, arresting and confining the persons who form part of it, in order to disperse such assembly or that they may be punished according to law[9].

IPC 302: Punishment for murder.—whoever commits murder shall be punished with death, or 1[imprisonment for life], and shall also be liable to fine. [10]

IPC- 304: Punishment for culpable homicide not amounting to murder: imprisonment for life, or up to 10 years and also fine. " provided that if death is caused to a girl or a women, the accused committing such homicide shall be punished with imprisonment for whole life and shall also be liable for fine which may extend to two lakh rupees.[11]

Guidelines laid down by Supreme Court

A three-judge bench of Chief Justice Dipak Misra and Justices A.M. Khanwilkar and D.Y. Chandrachud also urged Parliament to frame a special legislation to tackle the problems posed by vigilante squads and said that until then the guidelines would stand the force of law.

**The guidelines**

• The states shall designate a senior police officer not below the rank of police superintendent as nodal officer in each district. These officers will set up a task force to be assisted by one DSP-rank officer for taking measures to prevent mob violence and lynching. The task force will gather intelligence reports of people likely to commit such crimes or who are involved in spreading hate speeches, provocative statements and fake news

• The state governments shall immediately identify districts, sub-divisions and villages where instances of lynching and mob violence have been reported in the recent past. The process of identification should be done within a period of three weeks from the date of the judgment

• The nodal officer shall hold regular meetings (at least once a month) with the local intelligence units in the districts and station house officers to identify tendencies of vigilantism and mob violence.

• The director-general of police or the home department secretary shall hold regular review meetings (at least once a quarter) with all the nodal officers and state police intelligence heads

• All police officers will have to ensure the dispersal of mobs that have a tendency to cause violence or lynch in the garb of vigilantism or otherwise

• The DGP shall issue a circular to the SPs on police patrolling in sensitive areas

• The central and state governments should broadcast on radio, television and other media platforms, including the official websites of the home department and the state police, that lynching and mob violence will invite serious consequence

• The police shall register FIRs under Section 153A of the IPC (promoting enmity among people) and/or other relevant provisions against the perpetrators

**Remedial measures**

• Despite the preventive measures taken by the state police, if it comes to the notice of the local police that an incident of lynching or mob violence has taken place, the jurisdictional police station shall immediately lodge an FIR

• It shall be the duty of the station house officer to immediately intimate the nodal officer in the district who shall, in turn, ensure that there is no further harassment of the family members of the victim(s)

• The investigation in such offences shall be personally monitored by the nodal officer, who shall be duty-bound to ensure that the investigation is carried out effectively and the charge sheet filed within the statutory period

• The cases of lynching and mob violence shall be specifically tried by designated courts in each district. Such courts shall try cases on a day-to-day basis. The

trial should preferably be concluded within six months.

Deterrent punishment

• The trial court must ordinarily award the maximum sentence under the provisions of the IPC

• The courts may, on application by a witness or by the public prosecutor, take such measures as it deems fit, for protection and for concealing the identity and address of the witness

It is important to note that India does not have one comprehensive parliamentary law on mob lynching. In 2017 K.T.S Tulsi introduced a draft bill in Rajya Sabha. But the bill has never been debated upon and has not been passed till date.

Some of the bills that have been passed regarding mob lynching are:

U.P combating of mob lynching bill.

[not passed yet]

As per the available data from 2012 to 2019, 50 incidents of mob violence have taken place in Uttar Pradesh. Of around 50 victims, 11 have died. Twenty-five of these were cases of major assault, including those by cow vigilantes (Gau-Rakshak). The Uttar Pradesh Law Commission has submitted a draft Bill recommending up to life imprisonment for mob lynching crimes.

The chairman of the Commission, Justice (retd.) AN Mittal submitted the report on mob lynching, along with the draft Bill to Chief Minister Yogi Adityanath.

The Commission said the existing laws were not sufficient to combat lynching and asserted that there should be a separate law to tackle them. It suggested a punishment ranging from seven years in jail to life imprisonment for the offence.[13]

The Rajasthan Protection from Lynching bill.

Rajasthan Legislative Assembly on August 6, 2019, passed a bill against mob lynching and honour killing in the state.

• The anti-mob-lynching bill proposes imprisonment up to seven years and a fine up to Rs. 1 lakh in case of the victim suffering simple injuries.

• The convicts will get jail terms up to 10 years and a fine of Rs. 25,000 to Rs. 3 lakh in case of an assault by mob or victim suffering serious injuries.

• In case of victim's death, the Rajasthan Protection from Lynching Bill, 2019 provides for life imprisonment and a fine from Rs. 1 to 5 lakh to those convicted in cases of mob lynching.[14]]

The West Bengal (Prevention of Lynching) Bill

The legislation, which has provision for the death sentence, says "nodal officers" will be appointed to "monitor and coordinate prevention of lynching". It proposes a jail term from three years to life for those involved in assaulting and injuring a person. The Bill, while defining terms such as "lynching" and "mob", says the West Bengal Lynching Compensation Scheme may be framed under this Act.[15]

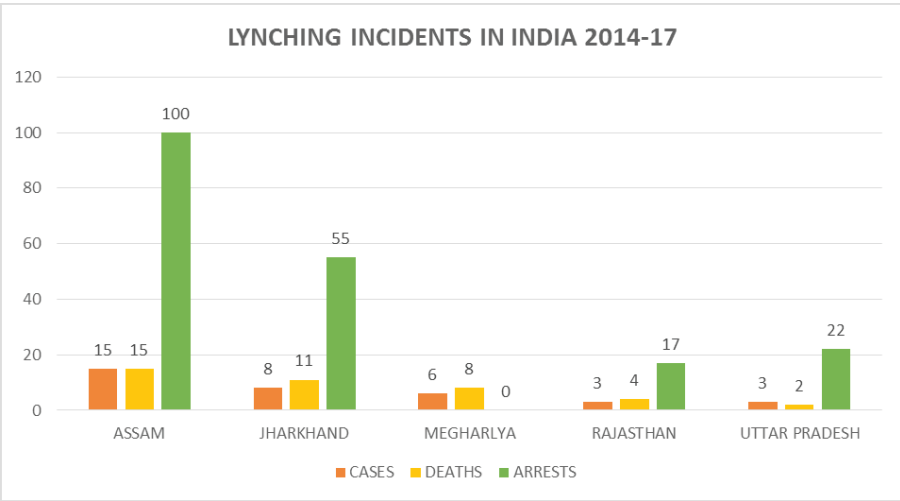


**FIGURE: 2; Source: Google Images**

## Conclusion

Mob lynching is a type of organised hate crime conducted by a crazy mob. People should have empathy towards such crime and not the apathy attitude. Government should address this issue very seriously at least in states where the incident rate is very high on priority basis. It is necessary to have separate law in the IPCs to address lynching and honour killing crimes as there are no specific laws to address these crimes. If necessary separate and new sections should be incorporated in the IPC as there is a new and separate section to deal with acid attack cases i.e., section 326A and 326B. It is unfortunate that this crime is ignored from government's end till date. Strong provisions of law and speedy convictions in mob lynching cases will act as deterrence for the society.

**Acknowledgement:** Authors would like to thank print and electronic media for providing us with immense resource materials in preparation of this article.

**Conflict of Interest:** Nil

**Source of Funding:** This research was financially supported by UGC.

**Ethical Clearance:** The present study was approved by "Institutional Ethical Committee" of Institute of Medical Sciences, Banaras Hindu University, Varanasi. All the information has been taken under consideration of medical ethical committee.

Statement of Informed consent: This is a review study done by going through various online contents. No consent was required.

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# Radiological Study of Appearance and Fusion of Iliac Crest in hip bone in Bikaner Region in 14-22 Years Age Group

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## Abstract

Correct age determination has of great importance in legal prosecution. The principle means, which enable one to form a fairly accurate opinion about age of an individual are general physical development, dentition, secondary sex characters and ossification of bones. Among them Radiological examination of ossification process is most accurate than any other method up to 25 years of age.

This study involves radiological examination of Pelvis (AP view) of 169 individuals for the study of age related appearance and fusion of ossification center of Iliac Crest in the individuals of age group of 14-22 years of both male and female in S P Medical college, Bikaner, Rajasthan.

***Keywords:*** *Age Estimation, Iliac Crest, X- Rays.*

## Introduction

Estimation of reasonably accurate age, plays an important role in civil/criminal cases like personal identification, fixing of criminal responsibility, judicial punishment i.e. in cases of rape, kidnapping, criminal abortion, attempted or evident murder, theft, burglary, dacoity and in various schemes of Social Welfare department i.e. Employment, attainment of majority, marriage contract etc.

Various workers suggest that there is a variation in age estimation, not only in country to country but also in different states of India, so Survey Committee12 (1964) while reporting on medico legal practice in India has recommended to the government to encourage Zone wise study for the problem of determination of age.

## Material and Method

This study is carried out in the Department of Forensic-Medicine and Toxicology in association with radio- diagnosis department of S.P. Medical College and Hospital, Bikaner. The subjects are selected randomly from various schools, from neighborhood of various faculty members and staff as well as cases attending the OPD of the Forensic-Medicine Department of P.B.M. Hospital, Bikaner. The persons selected for study were grouped as per their stated age, viz.:- 14-15years, 15-16 years, 16-17 years, 17-18 years, 18-19years, 19-20 years, 20-21years and 21-22 years. Here age 14-15 years means person of 13 years or more but below 14 years. Age, as stated by them is further confirmed by secondary school certificate, any document reflecting their exact age or entry in their school record.

Selection Criteria for inclusion of person in present study:

C) They should be living in Bikaner region for more than 5 years.

D) They should be free from any physical disability or endocrinal anomaly.

E) Person should have accurate record of their date of birth.

F) Informed expressed verbal consent of the subjects was taken before proceeding to their physical, dental and radiological examination.

Radiological Criteria for epiphyseal fusion –

The union is taken as complete when the:

a) Diaphyseo-epiphyseal space is completely obliterated and become bony in architecture and density.

b) There is continuity of the periosteum between epiphysis and diaphysis with no notching at the periphery of epiphyseal line.

c) Presence or absence of epiphyseal scar (a white, transverse line) has been disregarded in this connection and considered as recent complete union.

For generalization, fusion in more than 75% cases is relied upon as complete fusion. Radiological data of appearance and fusion of ossification center of Iliac Crest were reduced to table, of various age groups. Data thus obtained finally, were analyzed and compared with published work of various Indian and foreign workers.

Observation

In Boys - The appearance of the ossification centre of iliac crest was observed earliest at the age of 14 year, 4 months and 4 days in our study. The appearance of the ossification centre of iliac crest was observed in 90% of cases in age group 15-16 years, in 100% of cases in age group 19-20 years and above. Average age of appearance of iliac crest is 15-16 years in our study. Complete fusion of iliac crest was observed earliest at the age of 16 year, 2 months and 10 days in our study. Complete fusion of iliac crest was observed in 90.91% of cases in age group of 20-21 years. Average age of fusion of iliac crest was 20-21 years in boys in our study. Age of oldest subject not showing complete fusion of iliac crest was 21 years, 8 months and 19 days in our study.

**Appearance and Fusion of the Centre of Iliac Crest in Boys**

| S.No. | Age (Yrs) | No. of cases | Appearance | | Partial Fusion | | Fusion | |
|---|---|---|---|---|---|---|---|---|
| | | | No | % | No | % | No | % |
| 1 | 12-13 | 12 | - | - | - | - | - | - |
| 2 | 13-14 | 9 | - | - | - | - | - | - |
| 3 | 14-15 | 7 | 1 | 14.28 | - | - | - | - |
| 4 | 15-16 | 10 | 9 | 90 | - | - | - | - |
| 5 | 16-17 | 17 | 17 | 100 | 3 | 17.65 | 1 | 5.88 |
| 6 | 17-18 | 25 | 20 | 80 | 2 | 8 | 4 | 16 |
| 7 | 18-19 | 19 | 18 | 94.73 | 7 | 36.84 | 6 | 31.57 |
| 8 | 19-20 | 10 | 10 | 100 | 2 | 20 | 6 | 60 |
| 9 | 20-21 | 11 | 11 | 100 | 1 | 9.09 | 10 | 90.19 |
| 10 | 21-22 | 12 | 12 | 100 | 1 | 8.33 | 11 | 91.67 |

In Girls - The appearance of the ossification centre of iliac crest was observed earliest at the age of 15 year, 1 month and 1 day. The appearance of the ossification centre of iliac crest was observed in 100% of cases in age group 15-16 years and above. Average age of appearance of iliac crest was 15-16 years in girls in our study. Complete fusion of iliac crest was observed earliest at the age of 15 year, 1 month and 1 day in present study. Complete fusion of iliac crest was observed in 100% of cases in 19-20 years of age group and above in girls.

Average age of fusion of iliac crest in girls was 19-20 years in our study. Age of oldest subject not showing complete fusion of iliac crest was 18 years, 5 months and 10 days in present study.

**Appearance and Fusion of the Centre of Iliac Crest in Girls**

| S.No. | Age (Yrs) | No. of cases | Appearance | | Partial Fusion | | Fusion | |
|---|---|---|---|---|---|---|---|---|
| | | | No | % | No | % | No | % |
| 1 | 12-13 | 8 | - | - | - | - | - | - |
| 2 | 13-14 | 2 | - | - | - | - | - | - |
| 3 | 14-15 | 2 | - | - | - | - | - | - |
| 4 | 15-16 | 4 | 4 | 100 | - | - | 3 | 75 |
| 5 | 16-17 | 6 | 6 | 100 | 2 | 33.33 | 3 | 50 |
| 6 | 17-18 | 19 | 19 | 100 | 11 | 57.89 | 4 | 21.05 |
| 7 | 18-19 | 10 | 10 | 100 | 7 | 70 | 1 | 10 |
| 8 | 19-20 | 5 | 5 | 100 | - | - | 5 | 100 |
| 9 | 20-21 | 4 | 4 | 100 | - | - | 4 | 100 |
| 10 | 21-22 | 8 | 8 | 100 | - | - | 8 | 100 |

## Discussion

In Female: In our study we observed the average age of appearance of ossification centre of iliac crest in female at 15-16 years of age, which is consistent with the observation of the study of Nagi Abdul Wahab Abdulla1 et al (Yemen), Alok Kumar4 et al (Kanpur) and Yatiraj Singi[15].

In our study we observed the average age of fusion of the ossification centre of iliac crest in females at 19-20 years, which is consistent with the observation of the study of Nagi Abdul Wahab Abdulla1 et al (Yemen) also with observation of Chandresh Tailor[13] (Surat) and as stated by RK Sharma10, Nagesh Kumar Rao8, Krishan Vij14 and VV Pillay[7] in their textbooks .

In Male: In our study we observed the average age of appearance of ossification centre of iliac crest in male at 15-16 years of age. The finding in our study is consistent with the observation of the study of Alok Kumar4 et al (Kanpur) and Apurba Nandy6 they observed that it is 16 years of age and also consistent with Grant's Anatomy2, a standard textbook of anatomy, who stated that it is 16 years of age.

In our study we found the average age of fusion of the ossification centre of iliac crest in males is 20-21 years, which is consistent with the observation of the study of Pardeep Singh, RK Gorea11 who conducted study at Patiala, Punjab and also as stated by N.Reddy9 in his textbook, that it is 20-21 years of age also is consistent with the observation of Memchoubi Ph.5 who observed that it is 20 years of age and it is also consistent with the age as stated by PC Dikshit3 in his textbooks.

## Conclusion

Average age of appearance of the ossification centre of iliac crest observed at 15-16 years in boys in our study in Bikaner region.

Average age of fusion of iliac crest observed at 20-21 years in boys in our study in Bikaner region.

Average age of appearance of the ossification centre of iliac crest observed at 15-16 years in girls in our study in Bikaner region.

Average age of fusion of iliac crest in girls observed at 19-20 years in our study in Bikaner region.

Findings of our study are again giving the strength to the workers and Survey Committee12 report, as they suggest to the government to encourage Zone wise study for the problem of determination of age. This study is an attempt which may be a valuable aid to a forensic practitioner to give the approximate age certificate in medicolegal cases.

**Ethical Clearance-** Taken from Ethical committee of S.P. Medical College and Group of Hospitals, Bikaner Rajasthan.

**Source of Funding-** Self

**Conflict of Interest -** Nil

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# Abortion Laws in India: Issues and Challenges in 21st Century

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## Abstract

India is a nation which requires societal awakening in ample of affairs. The progress of a nation isn't solitary indomitable by fiscal eminence nevertheless by the in general wellbeing of its populace and consequently, being a "developing country" necessitate communal development. There is prevalent ignominy enclosed to abortion in the nation. The abortion law in India restrain the "reproductive autonomy" of women and the provisions of the Act are being violative of the provisions of Constitution of India. Women subsequent to passing of MTP Act are also performing unsafe abortions which have adverse effect on their wellbeing. For that reason the legal status of abortion law need to be altered according to the current scenario. The research paper intended at scrutinizing the Act and suggestion that the legislature ought to uphold while amending the present Act.

***Keywords:*** *Abortion, Right to life, Health, Fundamental right, MTP Act, POSCO Act,*

## Introduction

Abortion has at all times been and prolongs to be a tremendously litigious subject. Whether one must be allowed by law to have an abortion, if yes, beneath what conditions? Secondly, how does the law construe the human rights of an unborn child? Based on this the humankind is alienated into two fractions i.e. pro-life and pro-choice. India may be termed as pro-life country as the termination of pregnancy was pictured by the legislature in only certain cases as prescribed in the MTP Act, 1971. By providing legal status to the unborn child a conflict between the "reproductive autonomy" of the pregnant and "right of life" of unborn is being created.

The Constitution is preeminent law to oversee the entire country. The Indian Constitution doesn't explicitly perceive the fundamental right of "reproductive autonomy". Be that as it may, Article 21 of the Constitution of India ensures a fundamental right to life and individual freedom. The articulation life in this Article implies an existence with human nobility and not simple endurance or creature presence. It is of broad magnitude to wrap "reproductive autonomy" in it. The Hon'ble Apex Court is performing magnanimous work of construing the Constitution.

### Evolution of Abortion

Till the late 1800s, females in Western region of Europe and the U.S. endow with abortion of each other without any legal restraint. In the late 1900s abortion was restricted in most of the country since at that period it was very treacherous procedure finished with rudimentary means, hardly any antiseptics and high mortality rate.

Since abortion was dangerous and were killing a lot of women, shielding women from the danger of abortion was the prerequisite and to restricting them to traditional childbearing role. In past abortion was termed as sin or was well-thought-out a form of evil doing of morality4. In the late 1800s, when the birth rate of whites were breaking down, the U.S. government asked white country conceived lady to have children and cautioned to keep the birth rate and demise rate equivalent. Early ventures private undertaking enterprise relied upon women for voluntary domestic workers, little paid tedious workers, and reproducer5. With the lacking of lawful abortion, woman commences it complicated to oppose the restriction of their role. During the 1890s, specialists rough that there were 20, 00,000 abortion each year in the U.S., Ladies who are resolute not to bear undesirable pregnancy have always begin a few methods to endeavour to terminate pregnancy. Frequently, they have turned to dodgy, some of the time lethal techniques, such as embeddings sewing needles, coat holders and like material into the vagina and uterus to prematurely end the pregnancy. During the 1960s, energized by the social

equality and hostile to anti-violence movement, ladies started to battle more vigorously for their privileges. The quickly developing women's movement took the banned subject of abortion to the network. Ladies walked and mobilized and convince for abortion to stipulate.

Recently, March for life an organization that started a protest in Washington D.C. which is hurriedly scattering in numerous countries of different continents. This movement is begun to go up against induced abortion on both ethical and radical ground and support its lawful prevention. The movement is acknowledged as the right to life and is also called the right to life movement. This anti-abortion movement turn out to be politically vigorous and bestow to setback of the case Roe v. Wade. Again on 22, September, 2019 thousands of individuals march for banning abortions in Slovakia the argued that "A human being is human being in spite of its size" and "Who kills an unborn child kills the future of the country".

**State failure to provide health care**

The Hon'ble Apex Court has upheld that Art. 21 of the Constitution oblige positive duty on the State, the scope of Art. 21 further enlarged; in this the court held that the government possesses responsibility to provide sufficient medical support to each person and work for welfare of the common public. Additionally Art. 21 impose compulsion on the state, the state is required to defend and preserve the right of all persons26. As it is held that right to safe abortions flow from right to health envisage in Art. 21 of the Constitution, the state hold a duty to provide adequate medical support to pregnant lady who wants to end the pregnancy.

The MTP Act was passed by the legislation with the purpose to reduce the occurrence of illegitimate abortion and ensuing maternal mortality and morbidity. But then also as claimed by the report of The lancet global health in 2017 Dec named as "The incidence of abortion and unintended pregnancy" in India, in the year 2015 it submitted that out of 15.6 million abortions in the year 2015 73% were performed through medical method abortion outside health facilities, 22% happened in health facilities and out of 73% abortion performed outside medical facilities 5% were done by means of unsafe method.

The Indian spend on Nov 5, 2017 had submitted that 56% of abortion in India are unsafe and 8.5% of all maternal deaths in India are caused due to unsafe abortion and 10 women die each day because of the ground of unsafe abortion performed by themselves. Also, half of the abortion performed is unsafe and incomplete and is increased from 30% to 50% in the preceding five years. It also accounts for a shortfall of 76.3% in obstetricians and gynaecologists weigh against their necessity at Community Health Centres. Private medical facilities are costly, and economically out of the reach of a large number of women. A both public and private health facility refuses women terminating pregnancy outside the approved 20-week gestational period.

According to the report submitted the lancet global health it roughly outlined that near about half of the pregnancy is unintended, usually most of them end up in abortion. Also disallowing a woman who wanted to abort may have negative developmental and socioeconomic effects on the exiting child.

Also, the National family health survey-4 figured that approximately most of abortions as a lot of 52% were provided private health facilities 20% in private and 26% were done by women themselves.

The Handbook on Medical Methods of Abortion to develop admission to New technologies for Safe Abortions by Ministry of Health and Family Welfare, Government of India dated January, 2016 records that a significant yet prevalent cause of maternal mortality in the country is unsafe abortion Accounting for approximately 8 % of all maternal deaths, it is the third-largest cause of maternal morbidity in the country and thus an area requiring focussed attention.

The WHO has repetitively solicited legal endorsement of abortions to guarantee the better corporal protection of women. The countries where abortion law is liberal, maximum abortion are performed in a safe situation as compared to developing nations with relatively strict abortion laws.

**Whether MTP Act clashes with POSCO and PC-PNDT Act?**

POSCO Act - Consent of legal guardian is required for termination of pregnancy of a minor under POSCO Act. All sexual activity beneath 18 years of age is matter to legal scrutiny. As a consequence, if any pregnant minor girl wants any sort of medical assistance then the doctor is required under law to report the matter to

concern authorities. This parameter under POSCO Act works contradictory with the MTP Act where the doctor is under obligation not to disclose the personal identity of abortion seeker. The outcome of this confliction is that the pregnant minor if fright from disclosure her identity have no other option other then hunt for unregistered, unregulated and at the end of the day unsafe abortions because safe facilities turn her away.

PC-PNDT Act - The PCPNDT Act disallows the sex-specific demonstration of foetus removal. This is a result of sonography and other development innovation being contorted to choose the sex of the unborn girl and end it ahead of time in instances of unborn female child. The contradiction that arises in the way of doctors conducting safe and sound abortions is the PC-PNDT. This Act aims a criminalizing sex determination at the time of ultrasound and tackles the scourge of female foeticide.

**Issues of abortion in the eyes of judiciary**

Abortion after the limit specified in the MTP Act i.e. 20 weeks is subject to judicial scrutiny and Hon'ble Apex Court and High Courts have discretionary power whether to allow or to dismiss the plea seeking abortion. As every individual is being different, the courts have pronounced distinctive verdict by scrutinizing different risk factors in every case. The Courts should do liberal interpretation as MTP is a welfare statute and imperative consideration should be given to the legislative intent behind making this Act.

Hon'ble Apex Court and High Court in several cases has directed the centre for amendment in MTP Act in the following cases-

In Anusha Ravindra vs U.O.I29, which is being sub judice in Apex Court, the Court issued notice to the centre for frame suitable medico-legal guidelines for urgent and safe medicinal facilities including abortion past 20 weeks in unusual cases.

At present in the case of Swati Agarwal and others vs U.O.I[30], which is sub judice in the Apex Court, The Apex Court has issued notice to the centre for decriminalization of abortion and affirmation of the right of absolute independence of women to make decision-related to reproductive right.

Again on 26, May, 2019 P.I.L was filed by Amit Sahni in Delhi High Court which is sub judice, asking the Court for extension of termination of pregnancy limit from present 20 weeks to 24 weeks. Scrutinizing that it required scientific reflection, Delhi High Court issued notice to the centre and National Commission for Women looking for their response to PIL seeking extension of time limit for abortion on a women's will to 24 or 26 weeks from current 12 week[31].

0n April 24, 2019 The Madras High Court issue notice to Centre and State governments looking for their reply in matter extension of period for abortion expressing that this issue needs urgent response as amendment is required[32].

The Courts are taking a scientific loom in the direction of technologically advanced prenatal diagnosis for the assessment of foetus health. As it has been resolute previously that the foetus becomes a "life" after 20 weeks and at the same time, it is only after 18 weeks that foetal abnormalities can be monitored and can be trapped in tests.

## Conclusion and Suggestions

Adolescent Pregnancy-If not terminated, pregnancy can be a cause of leaving school of adolescent girls which is a violation of their right to education under Art. 21A of the constitution of India. Based on their consequent lower education achievement, they may have less ability and opportunity meant for employment, frequently maintains succession of poverty, pregnancy diminish future retribution of girls.

The legislation is deficient in recognizing the rights of the rape victim's child. Even though the Hon'ble Apex Court has stated that every child is legitimate only parents can be Illegitimate but then also they don't have equal rights as weigh against to a legitimate child, in no personal law right of inheritance is being given them. The legislation if denies to terminate pregnancy after 20 weeks then should implement laws to protect their rights. As Allahabad High Court has acknowledged inheritance rights of a child born out of rape in the property of his biological father but held that it isn't feasible judicially to put down any rule for inheritance by a minor who is born as a consequence of rape. Such effort by Court would amount to legislation by judicial verdict41.

The discrimination between a married and unmarried woman in case of termination of unwanted pregnancy is also a violation of Art. 14 of the Constitution of India as there is no nexus of discrimination. A pregnant woman

should be stated as a pregnant woman regardless of her status as "married" or "unmarried".

As Art. 21 of the Constitution obliges positive duty on the State, the state should appoint more doctors in public health care centre as women especially in rural areas can't afford private doctors and due to which terminate pregnancy by using unsafe methods. In public health care centre, the facilities need to be urgent up-gradation to provide safe and timely abortion to women seeking it.

Basic sex education should be given to every woman to know her reproductive rights; the state should mandate schools to add a subject of sex education as a lack of knowledge in women is one of the causes of unsafe abortion.

There is a need to add medicines in national essential medicine list as medicine are very costly that a large number of women can't afford it.

The gestation limit should be increased from 20 to 24 or 26 weeks as due to advancement of science deformities in the foetus can be detected in late pregnancy.

People with disabilities are vulnerable as due to many barriers still exist in India and India has to cover a long distance to become disabled-friendly nation so, not allowing to terminate pregnancy in late stage of pregnancy if, detected any deformity is just putting a burden on parents. State although have enacted many laws in favour of disabled person then also fails to provide security to them.

The Bombay High Court rightly states that the state if, the rape victim wants, should at the time of pregnancy give the child to abortion or allow her to terminate the pregnancy42.

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# Effect of Core Stability And Functional Mobility Exercises on Muscle Strength after Lumbar Spinal Cord Injury

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## Abstract

**Background:** Many studies suggest that when people are confined to wheelchair, central neuropathies such as spinal cord injury usually reduce strength of core muscles and corresponding functional abilities for standing and reaching. Studies that have aimed to compare different strategies to improve functional capacity or stability have produced controversial results. Furthermore such studies have focused solely on individual component. In contrast, the present study describes the effect of core stability as well as functional mobility exercises on muscle strength after lumbar spinal cord injury.

**Aim:** To analyze the effect of core stability and functional mobility exercises on muscle strength after lumbar spinal cord injury.

**Methodology:** 25 patients with lumbar spinal cord injury were recruited on a volunteer basis. Ethics approval was obtained from Institutional ethical committee, KIMSDU. The purpose and procedure of the study was explained to each participant before giving their consent to participate in the study. Neurological levels and impairment scales were determined according to the American Spinal Injury Association (ASIA) standards. Descriptive statistics such as percentages, mean, and standard deviation were used for data analysis.

**Result:** The p-value for each component is <0.0001 and is extremely significant. For each variable of the study (muscle groups) the post assessment values were more than pre assessment values. The intervention used in this study produced significant improvement in core strength and lower extremity strength of participants after lumbar spinal cord injury.

**Conclusion:** Core stability and functional mobility exercises improve muscle strength in lumbar spinal cord injury patients.

***Keywords:*** *Lumbar spinal cord injury, core stability, functional mobility, physiotherapy.*

## Introduction

The spine is an inherently unstable structure as the osteoligamentus lumbar spine buckles under small compressive loading.[1] Paralysis of the muscles below the level of the injury can lead to limited and altered mobility, self care, and ability to participate in valued social activities.[2] Disabilities related to spinal cord injury vary according to the degree of damage, and the damaged spinal segments or nerve fibers.[3] Mechanism of the injury that can cause damage to the vertebrae with a resultant damage to the cord is usually a hyper flexion with rotation movement. Extension with rotation is less likely to cause damage to the cord.[4] Injury to the lumbar spine usually results in paraplegia or paraparesis.[5,6] Spinal cord injuries are typically divided into 2 categories: complete injuries and incomplete injuries. The international standards for neurological classification of spinal cord injury (ISNCSCI) defines a complete injury as having no sensory or motor function in the lowest sacral segments (S4 and S5). An incomplete injury is classified as having no motor and/or sensory function below neurological level including sensory and/or motor function at S4 and S5.[7]

Immediately following an acute injury to the spinal cord there is a stage of spinal shock. After the stage of

spinal shock has passed the various neurological deficits starts manifesting which commonly consists of the following: motor and sensory deficits, spasticity usually increases during first six months after spinal injury and reaches a plateau by the end of first year.[8]

A critical role of spine musculature is to stiffen the spine in all potential modes of instability. Active control of spinal stability is achieved through the regulation of force in surrounding muscles. Trunk extensors, flexors, and lateral flexors provide spinal stability during every dynamic movement. So, there is an important need to have balanced muscular control.[9] Proper timing and coordinated efforts of these muscles are important for spinal stability.[10]

Core stability describes the ability to control the position and movement of the central portion of the body to allow optimum production, transfer and control of force and motion to the terminal segments in the integrated activities.[11] Functional capacity has been studied as one important aspect of activity of daily living. Different functional training methods have been assessed for their effectiveness in improving functional capacity; [12.13] however, no definitive conclusions have been reached with regard to the type of functional training that is most effective.[13] Some studies have found that strength training can increase functional capacity,[14,15] even with only modest gains16 or gains in a few measures.[17] Nevertheless, most studies that have been conducted focuses only on singular elements i.e. few studies that have been conducted focuses only on core stability while other studies focuses only on functional mobility for improving functional capacity in patients with spinal cord injury. Studying the effectiveness of combination of two elements i.e. core stability and functional mobility exercises in lumbar spinal cord injury patients could provide different interpretation about the utility of core stability and functional mobility exercises to improve strength and functional capacity.[18] Therefore, the purpose of this study is to evaluate the effectiveness of core stability and functional mobility exercises on muscle strength in lumbar spinal cord injury patients.

## Material and Methodology

This study aimed to evaluate the effect of core stability and functional mobility exercises on muscle strength after lumbar spinal cord injury. This was an experimental study. The study was conducted in Krishna institute of medical sciences 'Deemed to be' University, Karad. 25 patients with lumbar spinal cord injury were recruited on a volunteer basis. Sample size was calculated with the help of formula $N=4SD2/(x\times£)^{2}$. Ethics approval was obtained from Institutional ethical committee. The participants were recruited according to the inclusion and exclusion criteria. The criterion for inclusion in the study was 1. Patients with history of American spinal Injury impairment scale (AIS) grade C and D SCI. 2.Both male and female participants. The exclusion criterion from the study was neurological illness other than lumbar spinal cord lesion. A written consent was taken from each participant to voluntarily participate in the study. Each participant was explained about the purpose and procedures of the study. Once the informed consent was taken, detailed information was gathered, assessments were done with appropriate outcome measure and pre test was done. Depending on pre assessment evaluated strength, a six week core muscle strengthening exercise protocol was given and follow-up for progression was done after 2, 4 and 6 weeks. Later again post test was done and descriptive statistics such as percentages, mean, standard deviations and paired t test were used for data analysis and were recorded in order to derive the conclusion. All statistical analyses were performed with instat software.

## Statistical Analysis and Result

Descriptive statistics were performed for all variables (i.e., muscle strengths). Pre and post assessments of the selected participants were done. Arithmetic mean, standard deviations, paired t –test and p-value were calculated for each outcome measure.

**Table no.1 Strength of muscle post intervention:.**

| Sr. no. | Muscle groups | Mean | | SD | | Paired t-value | p-value | Interference |
|---|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | | | |
| 1. | Hip flexors | 2.280 | 4.440 | 0.8907 | 1.261 | 8.035 | <0.0001 | Extremely significant |
| 2. | Hip extensors | 2.480 | 3.920 | 1.112 | 1.288 | 4.793 | <0.0001 | |
| 3. | Hip abductors | 2.400 | 3.640 | 1.000 | 1.075 | 4.656 | <0.0001 | |
| 4. | Hip adductors | 2.480 | 3.920 | 0.8718 | 1.152 | 5.192 | <0.0001 | |
| 5. | Knee flexors | 3.200 | 4.560 | 0.8699 | 0.9129 | 5.283 | <0.0001 | |
| 6. | Knee extensors | 3.080 | 4.840 | 0.7024 | 0.9434 | 9.508 | <0.0001 | |
| 7. | Ankle dorsiflexors | 2.120 | 3.480 | 0.8327 | 0.9626 | 6.834 | <0.0001 | |
| 8. | Ankle plantar flexors | 2.680 | 3.800 | 0.4761 | 0.7071 | 7.716 | <0.0001 | |
| 9. | Great toe extensors | 2.160 | 3.520 | 0.8505 | 1.085 | 5.911 | <0.0001 | |
| 10. | Trunk flexors | 1.680 | 3.200 | 0.6272 | 0.7638 | 14.905 | <0.0001 | |
| 11. | Trunk extensors | 1.560 | 3.200 | 0.5066 | 0.7638 | 14.421 | <0.0001 | |
| 12. | Side flexors | 1.880 | 3.560 | 0.5831 | 0.6000 | 15.087 | <0.0001 | |
| 13. | Trunk rotators | 1.640 | 3.160 | 0.5686 | 0.6245 | 14.905 | <0.0001 | |

The post assessment values of each study variable (muscle groups) are more than the pre assessment values. The mean difference of pre assessment values is -1.508. The mean difference of post assessment values is -0.172

**Table no.02 : strength of lower extremity muscles and core muscles of body in male subjects.**

| Males | Mean | SD | Paired t-value | p-value | Interference |
|---|---|---|---|---|---|
| Pre | 2.098 | 0.2762 | 15.489 | <0.0001 | Extremely significant |
| Post | 3.331 | 0.4612 | | | |

The post assessment values of mean and SD of overall core and lower extremity strength of male participants are more than the pre assessment values. The mean difference is -1.234.

**Table no.03 : strength of lower extremity muscles and core muscles of body in female subjects.**

| Females | Mean | SD | Paired t-value | p-value | Interference |
|---|---|---|---|---|---|
| Pre | 1.852 | 0.2969 | 6.891 | <0.0001 | Extremely significant |
| Post | 3.409 | 0.6149 | | | |

The post assessment values of mean and SD of overall core and lower extremity strength of female participants are more than the pre assessment values. The mean difference is -1.558.

## Discussion

This study aimed to analyze the effect of core stability and functional mobility exercises on muscle strength after lumbar spinal cord injury. Core stability is the ability of lumbopelvic hip complex to prevent buckling and to return to equilibrium after perturbation.[19] Functional mobility is the manner in which people are able to move around in the environment in order to participate in the activities of daily living.20 Weakness is the most obvious impairment that inhibits people with SCI from performing motor tasks. [21]

In this study 25 patients were recruited according to the inclusion and exclusion criteria, in which 13 were male participants and 12 were female participants. Manual muscle test was performed on each subject for thirteen muscle groups (hip flexors, hip extensors, hip abductors, hip adductors, knee flexors, knee extensors, ankle dorsiflexors, ankle plantar flexors, great toe extensor, trunk flexors, trunk extensors, side flexors and trunk rotators) in standardized position.22 Muscle strength was graded on a scale from zero to five using six weeks of interval.23 We evaluated the pre test and post test assessment values for manual muscle testing in the selected participants.

Depending on the pre assessment values a six week core stability and functional mobility exercise protocol was given and follow up for progression was done after 2, 4, 6 weeks interval. In the initial phase of treatment galvanic current was given to trunk and lower extremity muscles with the frequency as tolerated and passive range of motion exercises to trunk and lower extremity muscles which initiated flicker of contractions.24 Denervated muscles are incapable of contraction except by direct stimulation of the muscle fibers by suitable electrical means.[25] Once the initiation of contractions was achieved electrical stimulation with the help of faradic current to motor nerves of spine and lower extremity was used. Innervated muscles contract in response to a demand for activity provided the demand is sufficient.[24] Once the patient was able to do active contractions, active assisted range of motion exercises were initiated. Once the power of contraction has been regained, the muscles were strengthened progressively until maximum function was obtained.[25] Strengthening of trunk and lower extremity muscles was done with isometric strengthening program. A person requires a progressive resistance training program in which the load is appropriately and progressively increased. Such training is often best performed within the context of a functional skill, provided the principles of progressive resistance training can be maintained.[26] Varieties of methods which were used for providing resistance are pulleys, free weights, weight cuffs and theraband.25 Resistance training increases muscle strength by making muscles work against a weight or force.[27] Bed mobility exercises were used to improve functional mobility of the participants.[25] After all this procedure the post test assessment values were evaluated.

Richardson et al. proposed that lumbar stabilization exercise increased the stability of the spine and posture while performing functional postures and movements.28 Panjabi reported that lumbar stabilization exercise, a muscle strengthening exercise for the deep muscle group, plays an important role in providing dynamic stabilization in the segments stability, and useful for decrease in spinal functional disorder.[29] Specific transverse abdominal muscle strengthening along with the conventional treatment shows speedy recovery than the only conventional therapy when given at the acute and sub-acute stages of traumatic spinal cord injury.[30] The present study also found improvements in lower extremity muscle strength as well as functional capacity after performing core stability and functional

mobility exercises. The post test results derived that the stabilization exercises used in this study produced significant improvement in muscle strength in the lumbar area thereby improving functional capacity and muscle strength in the lower extremity.

## Conclusion

Core stability and functional mobility exercises improve muscle strength in lumbar spinal cord injury patients.

**Ethical Clearance -** Obtained from INSTITUTIONAL ETHICAL COMITTEE, KIMSDU, Karad.

**Source of Funding-** This project was funded by Krishna Institute of medical sciences deemed to be university, karad.

**Conflict of Interest** - Nil.

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# A Study to Assess Effectiveness of Jacobson Progressive Relaxation Technique on Sleep Quality among Elderly in Selected Old-Age Home of Kheda District

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## Abstract

The aim of study is to improve sleep quality of elderly by providing Jacobson progressive technique in which Quantitative approach was adopted with Pre-experimental one group pre-test post- test. Study was conducted in selected old-age home of Kheda district. 30 Sample was selected by Non-probability purposive sampling technique. The Study instrument used by researcher consisted two sections i.e. demographic profile and Pittsburgh sleep quality index. Reliability of the tool was 1.00 with the help of coefficient-correlation Karl Pearson formula. Pilot study was conducted among 3 samples and the study was found feasible. After two weeks of pilot study final study was conducted. Descriptive and inferential statistics was used to analyse the data obtain was tabulated analysed and interpreted in terms of objective of the study. Average score of post test was 0.966 with standard deviation 0.96. Researcher applied t- test for comparison between pre-test and post-test. Calculated t-test vales corresponding to this comparison were 4.52 and table value were 2.05 ($p<0.05$). T Calculated value is more than T Tabulated value hence the Research hypothesis (H1) is accepted and null hypothesis is rejected (H0). So, it reveals that a Jacobson progressive relaxation technique is effective to improve sleep quality among elders.

***Keywords:*** *Jacobson progressive relaxation technique, Sleep Quality, Elderly*

## Introduction

Ageing is a physiological process that begins at birth. This biological inevitable process has health related, social, cultural and economic dimension. Ageing is not an illness but the increasing number and severity of the health problems and declining functional abilities are among the potentiality life changing problems of ageing. People experience many changes in physical, mental and social aspects as they age.

Old people are big support for family because they are our base and having better experiences then new age people. Old people know about the society very well and they are the strength of the family. So, do not let them to old age home keep them in family because in this age they need family support and care. Elderly needs smile a kind, polite word, attention and love that they really crave for one of the physical changes in elderly is in the characteristics of their sleep. Changes in sleep duration, pattern and quality occur with ageing.

The difficulty of falling asleep, maintaining sleep, sleep fragmentation, Getting up too early in the morning and more day sleeps are the other changes that occur in elderly with ageing.01 Elderly needs about 7 to 8 hours of sleep normally.

Jacobson progressive relaxation technique is an one type of therapy that focuses on tightening and relaxing of specific muscle groups in sequence and also helpful to relieve stress, anxiety, tension, fatigue and depression. Jacobson relaxation technique was invented by American physician Dr. Edmund Jacobson in the 1920 at Harvard University.2

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## Material and Method

Research approach: Quantitive research Approach. Research design: Pre- experiment Pre- experimental one group pre-test post- test. Research setting: selected old-age home of Kheda district by use of Pittsburgh sleep quality index. Sampling technique: Non-probability purposive sampling technique. Sample size was 30. The Study instrument used by researcher consisted two sections i.e. demographic profile and Pittsburgh sleep quality index.

**TABLE No.:1 SCORING SYSTEM OF SLEEP QUALITY**

| Sr.no. | Quality Of Sleep | Score |
|---|---|---|
| 01 | Very Good | 0 |
| 02 | Fairly Good | 1 |
| 03 | Fairly Bad | 2 |
| 04 | Very Bad | 3 |

This tool was validated by 8 experts from nursing field. Reliability of the tool was 1.00 with the help of coefficient-correlation Karl Pearson formula. Pilot study was conducted among 3 samples and the study was found feasible. After two weeks of pilot study final study was conducted. Descriptive and inferential statistics was used to analyse the data obtain was tabulated analysed and interpreted in terms of objective of the study.

## Review of Literature

Philippe Voyer et al (2005) conducted this study was to determine the prevalence of insomnia and its associated factors in nursing home residents. A cross-sectional study ($n$ = 2332) was conducted among seniors living in long-term care facilities. The findings indicate that 144 (6.2%) participants had an insomnia disorder according to DSM-IV criteria, 17% displayed at least one symptom of insomnia, and more than half of the subjects were benzodiazepine users. According to multivariate analysis, psychological distress (adjusted odds ratio = 1.51) and disruptive behaviours (adjusted odds ratio = 2.10) were the only factors associated with an insomnia disorder among this population. In conclusion, insomnia is a fairly important problem, as a symptom or a syndrome, among elderly people and deserves attention from caregivers. Alternative interventions to benzodiazepine drugs, which are suited to long-term care residents while tailored to these specific care settings, should be developed.3

Won-Hyoung Kim (2008) This study investigates the prevalence and socio-demographic correlates of insomnia by considering a community sample of elderly individuals in South Korea. A face-to-face household survey was conducted in five regions of South Korea from June 2008 to August 2008. Among a total of 3,074 individuals aged 65 years and over, 2,002 participants were interviewed. The presence of insomnia was defined as having at least one of four sleep complaints that included difficulty in initiating sleep (DIS), difficulty in maintaining sleep (DMS), early morning awakening (EMA), and non-restorative sleep (NRS) more than three times per week in the last month. The Restless Legs Syndrome (RLS) Questionnaire, a short form of the Geriatric Depression scale (GDS), and a medical review of systems were implemented. Insomnia was found in 29.2% of the participants. DIS, DMS, EMA, and NRS accounted for 19.4%, 21.7%, 19.6%, and 8.0% of the participants respectively. Insomnia accompanied by daytime consequences accounted for 17.1% of the participants. The participants who were females, had no education, lived alone, showed symptoms of RLS or depression, and had a lifetime history of physical illness were significantly more likely to report insomnia. The prevalence of DIS, DMS, EMA, or insomnia increased slightly with age, whereas that of NRS decreased slightly.[4]

Senthilkumar Ramasamy (2018) conducted study to assess the effectiveness of Progressive muscle relaxation technique in reducing anxiety & depression among the hospitalized leprosy affected person in a tertiary care centre. This study is a case series of 50 leprosy affected people aged between 18–60 years who were admitted for leprosy complications in tertiary leprosy referral hospital. The Anxiety-Depression scale was developed and validated by the investigators and administered before intervention of PMRT and after 2 weeks. The finding shows that a statistically significant difference was observed on anxiety domain before and after application of PMRT. The anxiety means score showed steady decline from 6.76 at pre-test to 3.0 ($t=25.068$, $P\leq0.001$) at post-test and 1.12 ($t=22.679$, $P\leq0.001$) at follow-up. In depression domain, a statistically significant difference was seen in before and after application of PMRT. The depression means score showed steady decline from 6.92 at pre-test to 3.28 ($t=16.082$, $P\leq0.001$) at post-test and to 1.16 ($t=18.918$, $P\leq0.001$) at follow-up. This

study proved that the PMRT as a valid treatment option for hospitalized person with leprosy in minimizing the anxiety and depression related symptoms and to benefit the psychosocial wellbeing of leprosy affected patients.5

Ray (2014) conducted a prospective cross sectional study to assess the effectiveness of progressive muscle relaxation in female health care professionals in tertiary care hospital in eastern part of India. The 200 sample were recruited by using purposive sampling method. The presumptive life event stress scale was used in the study. The study finding reveals that significant decrease in resting heart rate, blood pressure and perceived stress scale level was seen after PMR training. The study concluded that increase stress among female health care professionals is a cause offer concern and there is a need to adopt early life style modification by practicing relaxation exercises to ameliorate stress.[6]

Bhumi Reddy Chetan Kumar (2017) conducted study to assess the effectiveness of Progressive Muscle Relaxation Technique on inducing sleep among cancer patients and to associate the effect of Progressive Muscle Relaxation Technique with the selected demographic variables. Quantitative approach and Quasi-Experimental one group Pre-test and Post-test research design was employed. Non-probability convenient sampling technique was employed to select 40 samples. Sleep Assessment Scale & Sleep problem assessment tool was used. All the 40 subjects of the study majority of them were falling in Dissatisfied Sleep 31(77.5%), 9[22.5%] subjects were falling under Disturbed sleep and no were falling under Sound Sleep category. There is a significant decrease in the post-test score (mean 30.7) of subjects after administration of Progressive Muscle Relaxation Technique compared to pre- test score (mean 55.62). Hence the Hypothesis H1 is accepted that is Progressive Muscle Relaxation Technique is effective to induce sound sleep. There is no significant association between the Effect of Progressive Muscle Relaxation Technique and the demographic variables. Hence regular muscle relaxation exercise can help the patient induce sleep and maintain in their healthy sleep pattern.[7]

Francis et al (2012) conducted study to evaluate the effectiveness of progressive muscle relaxation (PMR) on quality of sleep of hospitalized medical patients of a selected hospital in Mangalore. Randomized control trial was used to test the effectiveness of Jacobson's Progressive Muscle Relaxation Technique on quality of sleep (QOS) among 60 medical patients. Both the groups (Experimental and Control) were observed with pre-test and post-test. Demographic perfoma, Modified Pittsburgh sleep quality index and 3 point rating scale on assessing factors affecting Quality of sleep were used to collect data from the sample. The QOS was assessed in 84 patients admitted in medical ward out of which 60 (71.4%) had poor QOS and 24 (28.6%) had good QOS. The mean pre-test score of QOS in the experimental (30) and control group (30) were 16.667 and 16.70 respectively. Psychological factors (74.137%) affected QOS more than the environmental factors (65.989%). Repeated measures ANOVA revealed a significant difference in the QOS from Day 1 to Day 5(. F cal=378.38>F tab (1, 4) = 7.71, $p<0.005$). The Bonferri multiple comparison test revealed a significant improvement in the QOS from day 2 onwards. The calculated t-value of QOS was 17.892, was more than the table value t tab (58) = 2.00, $p<0.05$. Hence, the study revealed a significant improvement in the QOS in the experimental group after PMR. No significant association was found between QOS and selected demographic variables. The present study revealed that 5 days of progressive muscle relaxation therapy was very effective for medical patients with poor quality of sleep.[8]

In experimental group: Majority i.e. 33.33% elders were having 74 to 80years of age, 56.66% elders were female, 43.33% elders sleep were affected by Climate, 36.66% elders have Married and Widow, 40.00% elders staying in old-age home due to Misbehavior of son and daughter-in-law, 46.66% elders have not doing any activity, 36.66% elders sleep for 6-7 hours during night, 80.00% elders sleep for 1-1.5 hours during day time, 76.66% do not awake during night time sleep, 66.66% elders have a no any habit, 30.00% elders are suffering from Hypertension.

Demographic variable, Physical activity was found to have a significant association with sleep quality.

Demographic variables, Age, Gender, Factors affecting sleep, Marital status, Reason to stay in old-age home, Hours of sleep during night, Hours of sleep during day, Frequent night-time awakening, Habits and Medical disorders were did not found any significant association with sleep quality. (p value<0.05).

Average score in post-test effectiveness Jacobson progressive relaxation technique was 2.00 with standard

deviation 0.96.

## Discussion

The finding of the study was discussed with the objectives and hypothesis stated. The present study was undertaken to assess the effectiveness of Jacobson progressive relaxation technique on sleep quality among elderly. The sleep quality was significantly improved with Jacobson progressive relaxation technique among elderly.

## Conclusion

After Jacobson progressive relaxation technique shows that the Jacobson progressive relaxation technique is helpful for improving the sleep quality among the elderly. It concludes that assessment of sleep quality.

**Conflict of Interest:** None

**Source of Funding:** No separate funding was received for this study.

**Ethical Clearance:** The ethical clearance was obtained from our institute.

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# Awareness of Various Forms of Treatment Approaches in Stroke amongst Rural Population

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## Abstract

**Background:** Stroke is one of the leading cause for mortality and disability. As a medical emergency, timely and appropriate treatment is necessary to save the life and disabilities in patients. Based on the impairments and clinical outcomes of the disease its awareness on knowledge about the condition and treatment approaches should be done especially in rural population.

**Objectives:** 1. To study awareness about stroke 2. To study awareness of various forms of treatment approaches in stroke amongst rural population

**Material and Method:** It is a questionnaire-based survey. 100 subjects participated in the survey. The questionnaire was based on the awareness of treatment approaches. subjects with age 20 and above were included in this study. After the reception of responses, data was analyzed with help of appropriate statistical methods.

**Results:** Out of all respondents, 53% was female population and 47% was male population. Out of which 48 % of female population was aware about stroke and 5% females was unaware. 43% of male populations was aware about stroke and 4%of male population was unaware. The treatment approaches preferred were Medicine and physiotherapy.

**Conclusion:** In rural population, people are well aware about stroke but are less aware about various treatment approaches used.

***Keywords:*** *stroke, awareness, treatment approaches.*

## Introduction

Stroke is the sudden loss of neurological functions caused by an interruption of the blood flow to the brain.1Stroke is one of the leading causes of death and disability in India.3 Globally; stroke is a devastating neurological disorder and a leading cause of death and acquired disability. Women have lower age-adjusted stroke incidences than men. Women with early menopause have twice the risk of ischemic stroke as women with late menopause. Women over 85 years of age have an elevated risk compared to men.1

The majority of the stroke patients experience motor impairments, which affects movements of the face, leg and/or arm on one side of the body and sometimes both leg and arms of the body affects. Unfortunately, most stroke patients recover incompletely after stroke, despite intensive rehabilitation strategies. Although there is a diverse range of interventions aimed at improving motor outcomes after stroke, there is still a pressing need for novel treatment therapies and continued research to reduce disability and improve functional recovery after stroke.[9]

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The best form of treatment for stroke that emerged over last several decades is stroke unit.9Rehabilitation of a stroke patient begins as soon as any impairment is perceived and comprises traditional exercise programs and neuropsychological approaches with the primary aim of restoring mobility and function of patient.4

Different ways of handling stroke patients:

- Medicine
- Physiotherapy17,18
- Acupuncture
- Ayurveda (Panchakarma)
- Chiropractic
- Cupping
- Dry needling
- Brain stem stimulation
- Stem cell therapy
- Miscellaneous quack practice, 2,4-16 etc.

Awareness:

Lack of knowledge could be one of the reasons for variety of handling methods in both doctors and society. Ways of approaches are different for different places due to diversity in geographic distribution, traditional methods of practice, etc.

As stroke is one of the leading causes of mortality and disability its awareness in society needs to be analysed. Although, all such diverse range of treatment approaches are available for stroke, there is still a pressing need of awareness for such novel treatment therapies to reduce disability.13 Hence, we conducting the study of awareness of various forms of treatment approaches in stroke amongst rural population.

## Material and Method

Type of Study: Observational study

Study Design:Survey study

Place of Study:Rural Population in and around Karad(Dist.: Satara, State: Maharashtra, India).

Sample Size: Supposed to be 100. 4

$n = 4pq$

$L2$

Where, $p = 95.9$, $q = 4$

Statistical analysis:A questionnaire-based Observational study was done. Data was anonymously coded and entered into a spreadsheet program before being analyzed using statistical method. Percentage, frequency was calculated to summarize the response.

Sampling Duration: Approximately 6 months

Inclusion Criteria:

- population of age 20 and above.
- Both sexes

Exclusion Criteria:

- Subjects having mental illness, speech abnormalities.

Equipment's and Materials required:

Assessment Charts

Writing Material

Computer for online access

Outcome Measures

- Stroke Questionnaire

## Findings

Out of all respondents, 53% was female population and 47% was male population. Out of which 48 % of female population is aware about stroke and 5% females is unaware.43% of male population is aware about stroke and 4% of male population is unaware.

44% of female population have seen <=5 stroke patients and 9% of population have seen >5 stroke patients. 27% of male population have seen<=5 stroke patients and 20% of male population have seen >5 stroke patients. (Fig 1)

22% of female population is aware about the warning signs/ signs and symptoms about the stroke where 31 % of female population is unaware.21% of male population is aware about the warning signs/ signs and symptoms about the stroke where 26 % of male population is unaware.

33% of females are aware about the treatment approaches and 20% were unaware.34% of males are aware about the treatment approaches and 13% were unaware. 21% of female population and 13% of male population is aware about the medicine approach.25% of female population and 29% of male population is aware about physiotherapy for stroke.17% of female population and 12% of male population is aware about Ayurveda.20% of female population and 19% of male population is aware about the other approach. (Table1)

Various forms of treatment approach available in stroke out of which 12% of female population seen medicine as an approach used the most. 8% of male population agreed with medicine.19% of female population seen physiotherapy as an approach used the most. 24% of male population agreed with physiotherapy approach.11% of female population seen Ayurveda as an approach used the most. 10% of male population agreed with Ayurveda.16% of female population seen other methods as an approach used the most. 13% of male population agreed with medicine approach.(Table 2)

42% female and 29% male out of population will prefer medicine as treatment approach. 23% female and 32% male out of population will prefer physiotherapy as treatment approach.20% female and 14% male out of population will prefer Ayurveda as treatment approach. 0% female and 1% males out of population will prefer Homeopathy as treatment approach.18% female and 12% male out of population will prefer other approaches as treatment approach. (Table 3)In this study, 32% females out of population have seen recovered patients.34% of male population have seen patients recovered from stroke. (Fig 3)

44% of female population knows about physiotherapy and will prefer physiotherapy for stroke and 9% of female population won't prefer.41% of male population knows about physiotherapy and will prefer physiotherapy for stroke and 6% of male population won't prefer. 42% of female population knows about medicine and will prefer medicine for stroke and 11% of female population won't prefer.41% of male population knows about medicine and will prefer medicine for stroke and 6% of male population won't prefer.2% of female population knows about homeopathy and will prefer homeopathy for stroke and 51% of female population won't prefer.2% of male population knows about homeopathy and will prefer homeopathy for stroke and 45% of male population won't prefer.0% of female population knows about Ayurveda and will prefer Ayurveda for stroke and 53% of female population won't prefer.18% of male population knows about Ayurveda and will prefer Ayurveda for stroke and 29% of male population won't prefer.36% of female population knows about massage and will prefer massage for stroke and 17% of female population won't prefer.35% of male population knows about massage and will prefer massage for stroke and 12% of male population won't prefer.

15% of female population knows about quack practice and will prefer quack practice for stroke and 41% of female population won't prefer.8% of male population knows about quack practice and will prefer quack practice for stroke and 39% of male population won't prefer. (Fig2)

As per their awareness, the treatment approaches more preferred are Physiotherapy and Medicine.

**Table 1: What form of treatment can be given in stroke?**

| APPROACHES | GENDER | | | |
|---|---|---|---|---|
| | FEMALE | | MALE (%) | |
| | YES | NO | YES | NO |
| MEDICINE | 21 | 32 | 13 | 34 |
| PHYSIOTHERAPY | 25 | 28 | 29 | 18 |
| AYURVEDA | 17 | 36 | 12 | 35 |
| OTHERS | 20 | 33 | 19 | 28 |

**Table 2: Which treatment have you seen used most?**

| APPROACHES | GENDER | | | |
|---|---|---|---|---|
| | FEMALE | | MALE (%) | |
| | YES | NO | YES | NO |
| MEDICINE | 12 | 41 | 8 | 39 |
| PHYSIOTHERAPY | 19 | 34 | 24 | 23 |
| AYURVEDA | 11 | 42 | 10 | 37 |
| OTHERS | 16 | 37 | 13 | 34 |

**Table 3: Which treatment do you think prefer most?**

| APPROACHES | GENDER | | | |
|---|---|---|---|---|
| | FEMALE | | MALE (%) | |
| | YES | NO | YES | NO |
| MEDICINE | 42 | 11 | 29 | 18 |
| PHYSIOTHERAPY | 23 | 30 | 32 | 15 |
| AYURVEDA | 20 | 33 | 14 | 33 |
| HOMEOPATHY | 0 | 53 | 1 | 46 |
| OTHERS | 18 | 35 | 12 | 35 |

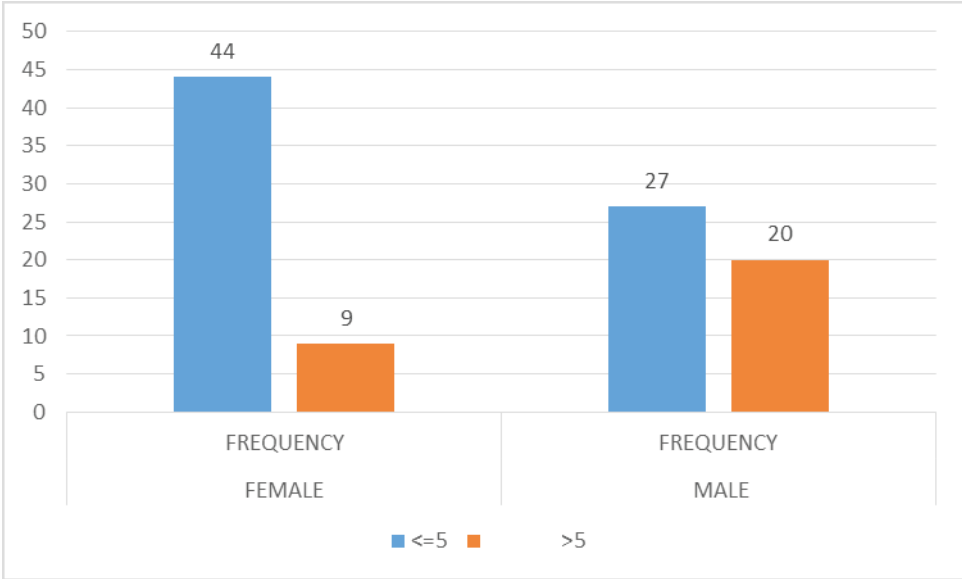


**Fig 1: How many cases of stroke have you seen?**

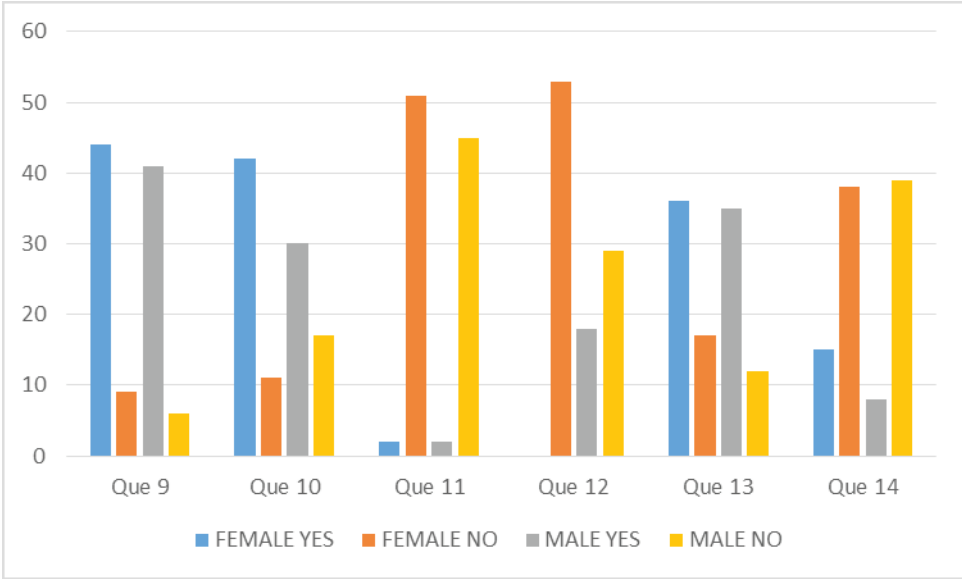


**Fig 2: Do you think this is effective in stroke? Would you prefer this for stroke?**

Que9: Physiotherapy Que10: MedicineQue11: Homeopathy Que 12: Ayurveda

Que13: Massage Que14: Quack therapy

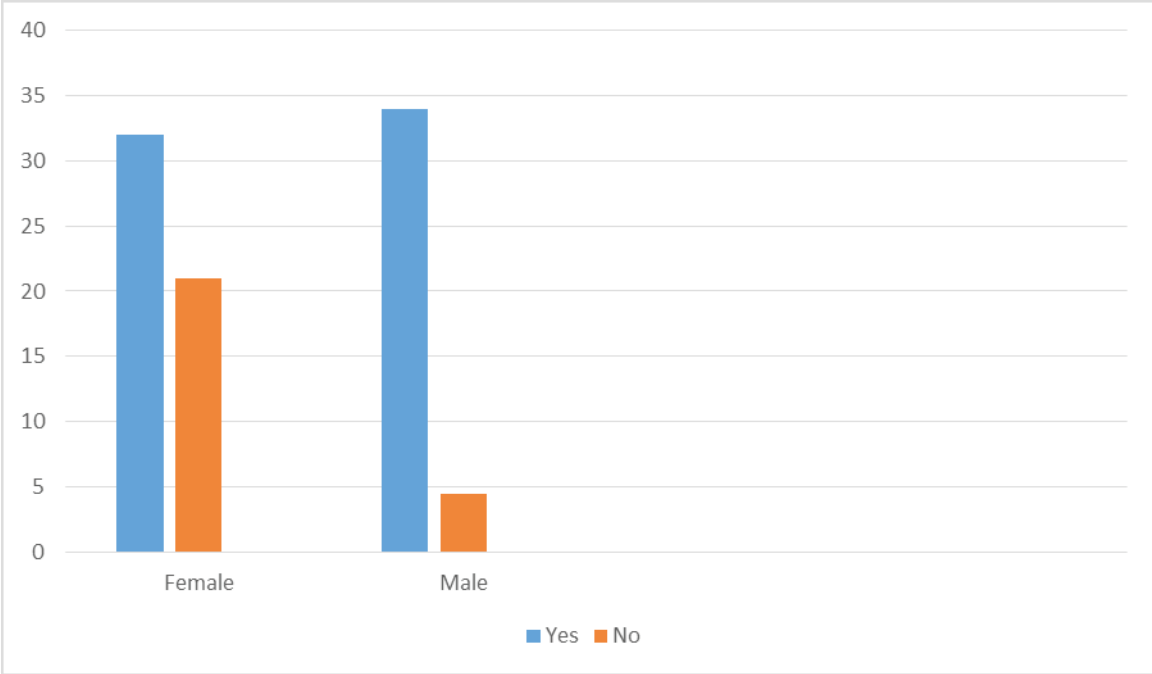


**Fig 3: Have you seen any one recovered from stroke and is able to do activities of daily living**

## Conclusion

On the basis of this study we conclude that there is awareness of stroke in rural population but there is less aware about various treatment approaches used for recovery.

## Discussion

Despite of advsances in the acute management of stroke, a large population of stroke patients are left with significant impairments. Over the coming decades the prevalence of stroke related disability is expected to increase worldwide and this will impact greatly on families, healthcare system and economics. Effective

treatment approaches is a key factor in reducing disability after stroke. In this study, 100 participants were taken in which 53% was female population and 47% was male population. According to our survey 48% of females and 43% of male population was aware.

Cardiovascular diseases affecting the brain and heart have common risk factors in developing atherosclerosis. Major risk factors for stroke are hypertension, Diabetes mellitus, disorders of heart and disorders of heart rhythm. There are some modifiable risk factors- Smoking, physical inactivity, obesity and diet. With some nonmodifiable risk factors- Family history, age, gender and race.22% of female population is aware about the warning signs/ signs and symptoms about the stroke where 31 % of female population is unaware.21% of male population is aware about the warning signs/ signs and symptoms about the stroke where 26 % of male population is unaware.

Rehabilitation of a stroke patient begins as soon as any impairment is perceived and comprises traditional exercise programs and neuropsychological approaches with the primary aim of restoring mobility and function of patient. According to this study, 33% of females are aware about the treatment approaches and 20% were unaware.34% of males are aware about the treatment approaches and 13% were unaware.. Medicine and physiotherapy are the two approaches preferred the most.

Literature and clinical experiences suggest that timely admission to hospital and proper care enhances neuronal plasticity, speeds the recovery and limits the impairments. In this study, 32% females out of population have seen recovered patients.34% of male population have seen patients recovered from stroke. (Fig 3)

Though rehabilitation is proved to be the best treatment patients also prefer other mode of treatment approaches such as Medicine, Acupuncture, Ayurveda, Chiropractic, Cupping, Dry needling, Brain stem stimulation, Stem cell therapy and Miscellaneous quack practice. Most of the population involved in the study was aware about physiotherapy and medicine and would prefer more as a treatment approach.

Quack is one who practice a form of medical system without qualification, training and registration from the appropriate council or authority. Still 15% of female population knows about quack practice and will prefer quack practice for stroke and 41% of female population won't prefer.8% of male population knows about quack practice and will prefer quack practice for stroke and 39% of male population won't prefer. (Fig2)

**Conflict of Interest:** There were no conflicts of interest in my study.

**Source of Funding:** Source Of Funding: Krishna Institute Of Medical Sciences Deemed to be University, Karad

**Ethical Clearance:** The Institutional Ethics committee has hereby given permission to initiate the research project(Protocol number 0458/2018-2019) titled, " AWARENESS OF VARIOUS FORMS OF TREATMENT APPROACHES IN STROKE AMONGST RURAL POPULATION"

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# Effect of Multidimensional Exercise Program for Improving Balance in Traumatic Brain Injury Patients

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## Abstract

**Background-** Balance disorder is a common problem in post-TBI patients. In many research's done before treatment is given mainly on motor component to improve balance in TBI patients. In this study we are going to give multidimensional protocol - sensory stimulations along with motor components. Balance is a main component of a patient for his mobility, many therapist concentrate on balance in chronic stage of TBI patients, in this study we are going to give treatment in acute stage of TBI patients which will help them to recover fast. There is lack of research's done on acute post TBI patients with multidimensional exercise program for balance disorder. Indeed this made us to study the effect of multidimensional exercise program on balance disorder in TBI patients. **Objectives**- To find out the effectiveness of multidimensional exercise program for improving balance control in mild TBI patients. To find out the effectiveness of multidimensional exercise program for improving balance control in moderate TBI patients. To find out the effectiveness of multidimensional exercise program for improving balance control in severe TBI patient. METHOD- In this study total 20 candidates were taken having impaired balance secondary to TBI from hospitals in karad. Their balance were assessed by berg balance scale and community balance and mobility scale. They were divided into mild, moderate and severe TBI. A multidimensional exercise protocol of 6 week was given for improving balance and their balance was checked at 2nd, 4th, and 6th week by same BBS and CBMS score. Later evaluation and interpretation of data was done. **Result-** The 20.8% improvement is seen in pre and post treatment BBS score and 8.82% improvement is seen in pre and post treatment CBMS score in post TBI patients with balance impairment. **Conclusion**- On the basis of result it can be concluded that multidimensional exercise program is effective for improving balance in TBI patients.

***Keywords-*** *Traumatic brain injury, Balance, Multidimensional, exercise program, physiotherapy.*

## Introduction

Traumatic brain injury is defined as an alteration in brain function caused by an external force. Brain tissue damage can be of two type: primary injury and secondary injury. Primary injury occurs due to direct trauma to the parenchyma. Secondary injury results from cascade of biochemical, cellular, and molecular events that occur due to an initial injury and injury related hypoxia, elevated intracranial pressure and oedema. (1) There is open head injury and close head injury, open head injury is associated with skull fracture and close head injury occurs in isolation without skull fracture. Blood supply of brain may also get indirectly affected due to the injury of face and neck. Most TBI occurs due to road traffic accident (RTA). The severity of brain injury may be categorised as mild, moderate and severe head injury. (2)

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In Mild traumatic brain injury there is minimal damage to the neuroanatomical structures with slight or no permanent impairment. Glasgow coma scale score of more than 13 is defined as mild TBI. In moderate TBI GCS between 8 -13 and the post traumatic amnesia lasting between 1 to 24 hours. Severe TBI is GCS score less than 8. [2]

After TBI – state of consciousness, sensorimotor changes, cognitive, emotional and behavioural changes, attention, balance, dizziness and visual dysfunction, spasticity and post traumatic headache. [2]

Balance disorder is a common consequence of traumatic brain injury. Balance is a condition in which the centre of mass is within the stability limit and base of support (BOS).Balance is depend on 1) sensory / perceptual systems responsible for the detection of body motion and position.2) motor systems responsible for presenting motor synergies.3) CNS process responsible for integration and action plans. (1) Balance is controlled by cerebellum and basal ganglion in brain, damage to this area may cause loss of control of balance.

To maintain a balance, it is important that central nervous system receives and integrates a somatosensory information, which includes both the tactile and proprioceptive system. The receptors which carry tactile sensations are Merkels cells, Pacinian corpuscles, Meissners corpuscles and Ruffini endings. And they are found in feet and might play an important role in maintaining body stability and balance in upright stance. The proprioceptive receptors are muscle spindle and Golgi tendon organs which carry the sense of joint position and joint motion. The proprioceptive receptors in feet are sensitive to ankle rotation and can give information about balance. [3, 4] Stimulation of these receptors may improve balance control in individual with post TBI. The rhythmic auditory stimulation (RAS) also improves the balance and gait of post TBI patients by stimulating brain functions involved in movement, cognition, emotions and sensory perception also RAS helps in execution of movements and normalizing gait parameters. [5, 6, 7] Balance incorporates two vestibular reflexes- the vestibuloocular reflex (VOR) and the vestibulospinal reflex (VSR). To improve balance after TBI the vestibular balance rehabilitation therapy and visual treatments are commonly used. [8]

Postural impairment and coordination are common consequences of TBI which may result in instability while performing day today activities like standing, walking, grasping, difficulty while coordinating eye-head movement and problem while focusing on target. The postural and coordination defect result from damage to cerebellum. [9]

The motor disability following TBI is a common, motor performance can be affected by damage to various loci in the nervous system which can cause reduction in muscle power and tonus disorder which can result in impaired balance. [6, 7] Focal or diffuse spasticity may appear following TBI. Time post injury is an important consideration as spontaneous neurological recovery may continue for 9- 15 months post injury. Motor impairment can also result from prolong immobilization and bed rest during acute period, prolonged immobility can cause effect on multiple body system that impact the motor function the most. Motor rehabilitation is essential in helping the patient re-establishing independence post TBI. [7, 8]

Impaired confidence in balance skill has been reported to cause depression, fear of falling and limited ability to participate in social activity. [9]

Examination of balance in TBI patients is done by using berg balance scale and community balance and mobility scale in ambulatory patients. (10, 11, 12) Initially many therapist concentrate on the motor component of patient to improve his balance in this study we are going to give multidimensional intervention for balance in acute phase of post TBI patients.

## Material and Method

This was a study to find the effect of multidimensional exercise program for improving balance in TBI patients. The study was carried out in hospitals from Karad. An approval for the study was obtained from the protocol committee and ethical committee of KIMSDU. Individual were approach and those fulfilling the inclusive criteria were selected. The purpose was explained and written inform consent was taken prepared in accordance with the Helsinki Declaration from those who are willingly to participate. Total 20 individuals were taken. The inclusion criteria was Acute TBI individuals, candidates with mild, moderate and severe TBI, Both male and females, Age- above 18 years and candidates with injury related balance disorder. The exclusion criteria was individual who are unable to follow simple commands, Intact balance after injury, unconscious patients, unstable vitals and candidates with any

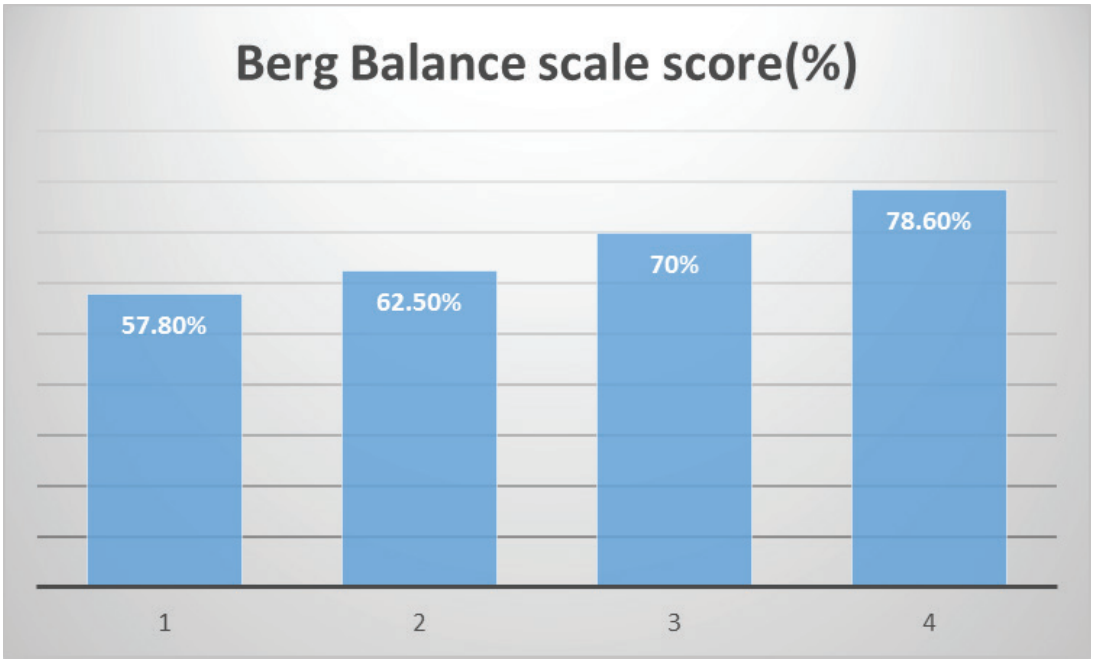
fracture of spine, lower and upper limb. Their balance was assessed by berg balance scale and community balance and mobility scale. Their tone was assessed by modified Ashworth's scale and stage of TBI were seen by initial GCS score. Then the candidates were given multidimensional exercises such as sensory training, bed mobility exercises – segmental rolling, pelvic bridging and heel slides. Active or active assisted ROM exercises to prevent contractures. Tone management by stretching and icing, proprioception training by joint compression, auditory clues by rhythmic auditory stimulation, visual feedback, vestibular rehabilitation exercises, balance and coordination training. This was given for 4 days per week for 6 weeks up to 45-60 minutes per session including rest time. The time of session increased as the week progresses, initially it took 30- 35 minutes per session and later progressed to 45- 60 minutes per session on 6th week.[13] The balance was checked at 2nd, 4th and 6th week by same berg balance scale and community balance and mobility scale to know the progression of candidates. Also the candidates were divided into mild, moderate and severe TBI. Later evaluation and interpretation was done using statistical analysis.

## Statistical Analysis

The paired T test and one-way ANOVA test were used for analysis of data. Statistical analysis of the recorded data was done by using the software SPSS version 20. The p value is less than 0.0001 which is extremely significant for pre and post treatment BBS score and CBMS score.

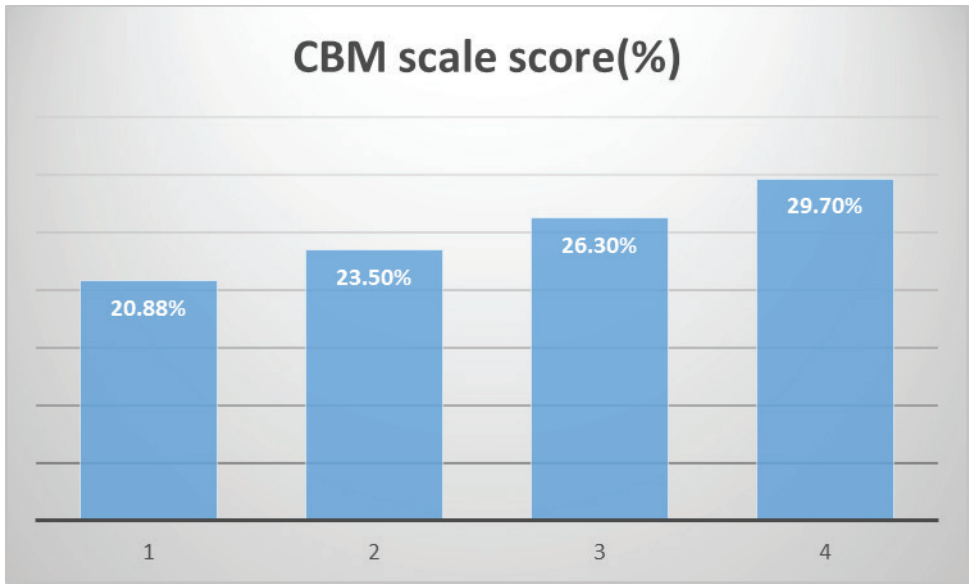
## Findings

The significant difference is seen in pre and post score of berg balance scale and community balance and mobility scale in post TBI patients with impaired balance after multidimensional exercise program of 6 week. The 20.8% improvement is seen in pre and post treatment BBS score and 8.82% improvement is seen in pre and post treatment CBMS score in post TBI patients with balance impairment.(p value= <0.0001). While the mild TBI candidates showed 27.38% more progression in BBS score and 18.38% more progression in CBMS score as compared to severe TBI candidates.(p value= > 0.05)



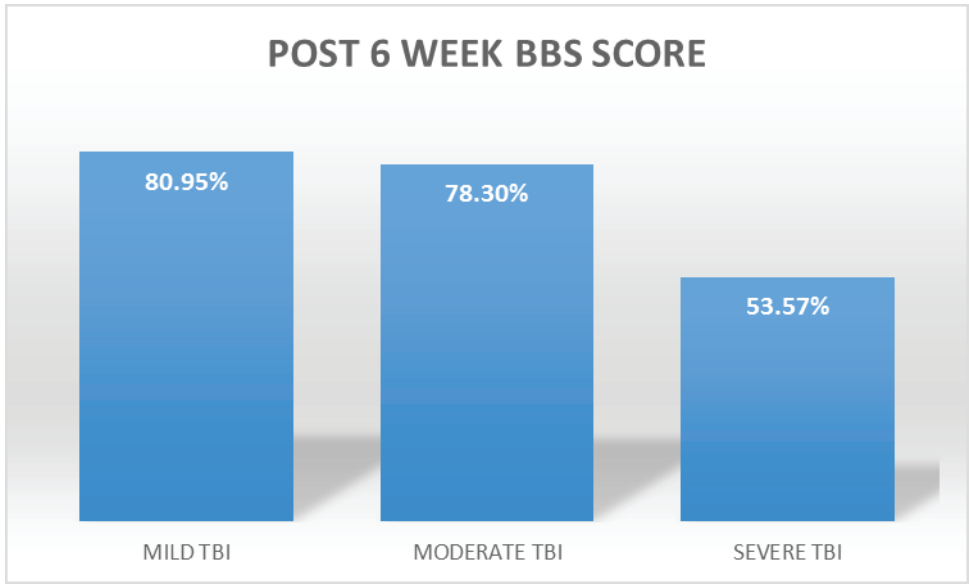

**Graph No.1- Comparison of Pre And Post Treatment Berg Balance Scale Score.**

INTERPRETATION- The above graph shows the comparison of berg balance scale score of pre-treatment, post treatment 2 weeks, post 4 weeks and post 6 weeks score in percentage. It shows significant improvement in score. 1) Pre-treatment score is 57.80%, 2) Post treatment 2 weeks score is 62.50%, 3) Post treatment 4 week score is 70% and 4) Post treatment 6 week score is 78.60%.



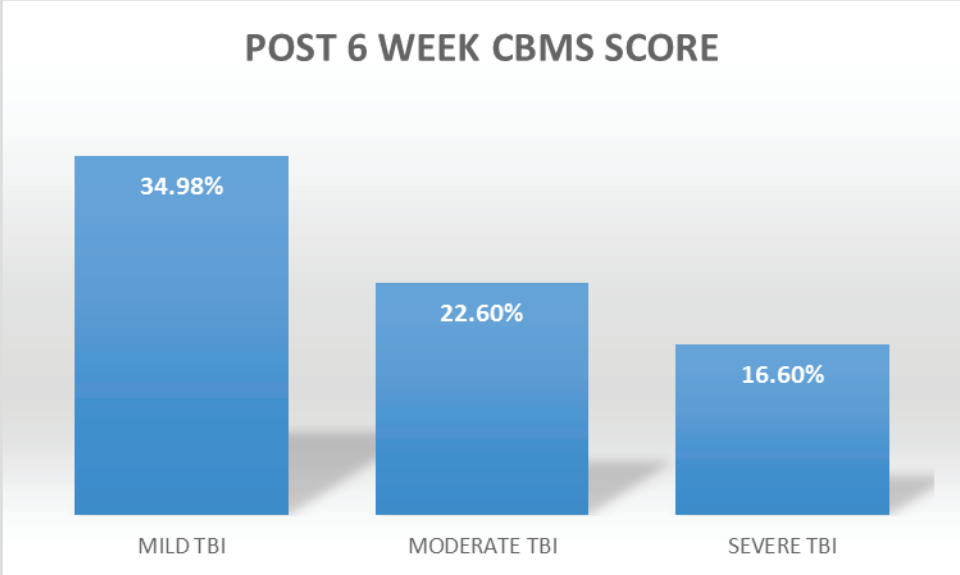

**GRAPH NO.2- COMPARISON OF PRE AND POST TREATMENT COMMUNITY BALANCE AND MOBILITY SCALE SCORE.**

INTERPRETATION- The above graph shows the comparison of community balance and mobility scale score of pre-treatment, post treatment 2 weeks, post 4 weeks and post 6 weeks score in percentage. It shows significant improvement in score. 1) Pre-treatment score is 20.88%, 2) Post treatment 2 weeks score is 23.50%, 3) Post treatment 4 week score is 26.30% and 4) Post treatment 6 week score is 29.70%.




**GRAPH NO.3- COMPARISON OF MILD, MODERATE AND SEVERE TBI PATIENTS POST 6 WEEK BBS SCORE**

INTERPRETATION- The above graph shows the comparison of BBS score post 6 week of treatment in mild, moderate and severe TBI patients in percentage. More improvement is seen in mild TBI patients then moderately and severed injured patients.




**GRAPH NO. 4- COMPARISON OF MILD, MODERATE AND SEVERE TBI PATIENTS POST 6 WEEK CBMS SCORE.**

INTERPRETATION- The above graph shows the comparison of CBMS score post 6 week of treatment in mild, moderate and severe TBI patients in percentage. More improvement is seen in mild TBI patients then moderately and severed injured patients.

## Discussion

The purpose of this study was to find out the effectiveness of multidimensional exercise program for improving balance in TBI patients. About 30% of patients report impaired balance after TBI. [(14)] In many research's done before treatment was given mainly on motor component to improve balance in TBI patients. Many currently practicing physiotherapist mainly concentrate only on motor components of patients. [(7)] Multicomponent exercise program have been found to be effective in managing various impairments following stroke [(15, 16)]. In this study we have given multidimensional protocol like sensory stimulations like tactile, auditory and visual feedback along with motor components like strengthening of trunk muscles, management of muscle tone, balance and coordination training and also prevention of contractures.

Our study included total 20 post TBI candidates with impaired balance. From which 60% candidates were of mild TBI, 35% were of moderate TBI and 5% candidate of severe TBI. In which 40% were females and 60% were males with TBI.

Balance disorder is a common problem in post-TBI patients. This problem may persist for life time after TBI which can affect the Patients daily activities and his mobility. For this early management of patients in its acute stage plays an important role.[(17)] In this study we took a candidates of acute stage from which 30% of them was having impairment in only dynamic balance and 70% were having impairment in both static and dynamic balance. The candidates having impairment in only dynamic balance was also given static balance exercises training to gain a confident in ambulation.

Motor management alone with sensory integration have a more effect in improving balance in post TBI patients. Vestibular apparatus has also been identified as sensory organ that controls sensations of balance and equilibrium in individual. In this study we found that candidates also had impairment in eye-head coordination movements which was improved by vestibular exercises which help in stabilizing gaze and eventually to improve the balance. The vestibular- ocular reflex supports stabilising vision while head is moving. (18) Vestibular rehabilitation is also effective in managing vertigo and dizziness which are commonly found after TBI. [(19)]

Evidence shows that auditory and motor system has high connectivity, hence many research have shown that RAS to be more effective than other sensory cues in rehabilitation. [(8)] Also RAS helps in motor relearning and neuronal plasticity. [(20)]

Stimulation to proprioceptors and somatosensory receptors in ankle and foot are also known to improve

balance. [3, 4]

Motor disturbances following TBI includes reduction of power, tonus disorder (spasticity) and motor control disorganisation. Reduction of spasticity helps in improving ROM and functional activities. The static balance is improved by decreasing muscle tone of neck and upper trunk. Thus improving balance of individuals. [21, 22]

The strength training for core muscles and lower limb also reported to improved patients balance and confidence in daily activities.

In the study made by Vishwajeet Trivedi, et al. showed the satisfactory effect of strength and balance intervention in improving balance, gait pattern and function independency in TBI Patient. Our research also support this study as in our study we have used strength and balance intervention for improving balance in post TBI. [23]

Limitation of this study was that the study is done with small sample size and in limited geographical area.

## Conclusion

On the basis of the results it is concluded that multidimensional exercise program is effective in improving balance in Traumatic brain injury patients. Multidimensional approach improves the balance in various grades of head injury.

**Conflicts of Interest:** There is no conflict of interest in this study.

**Source of Funding:** The study was funded by Krishna institute of medical sciences deemed to be university, karad.

**Ethical Clearance:** This study has undergone ethical clearance through the university level ethical committee. Protocol number 074/2019-2020.

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# Traumatic Spinal Injuries: An Autopsy Study at Tertiary Health Care Center of Rajasthan During the Year 2017-18

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## Abstract

**Introduction:** India is a developing country with traumatic fatalities is on the rise. Accurate injury profiles are helpful in prevention strategies as well as clinical and community services for persons suffering trauma especially of spinal region.

**Aim & Objectives**

**Aim:** To study the pattern of traumatic spinal injuries observed in medico-legal autopsies at S.M.S. Hospital, Jaipur during the study period 2017-18

**Objectives**

1. To observe the pattern of traumatic spinal injuries.
2. To observe survival pattern among the patients with soinal injuries
3. To observe the demographic data of traumatic spinal injuries.

**Material & Method:** Descriptive type of observational study of autopsy conducted at Mortuary of Department of Forensic Medicine, SMS Hospital, Jaipur from 1st April, 2017 to 31st March, 2018among Bodies with spinal injuries brought for medicolegal study during study period

**Observations:** a total number of 150 autopsy cases were included in the study.

Out of 150 cases of traumatic spinal injuries, there were 132 males (88%) and 18 females (12%). Maximum numbers of fatalities with spinal injuries were observed in 21-30 years age group (24.66%), there were 75.33% cases from rural regions unemployed (50.67%).

Majority of cases suffered fatality in one to seven days after the traumatic episode (41.33% cases). Road traffic accidents were the major offenders (44.00%) in the present study followed by falls. Level of spinal injury Mid cervical 53 (35.33%). Associated vertebral injuries seen along with spinal injuries as fractures of vertebrae in 49.33% cases and fractures along with dislocations in another 49.33% cases.

**Suggestions:-** Male of earning age group should be target group for education and awareness of spinal injuries prevention education. Mid cervical protection modalities should be deployed

***Key words:-*** *spine, cervical, vertebral injuries*

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## Introduction

Spinal injuries one of the major causes of death and disability around the globe1 including India2 and are of a major public health concern. Spinal injury may be caused by traffic and non traffic accidents, falls from

same or higher levels, fall of heavy objects on the head, neck and back of the body, etc. which may vary in manner from accidental or self inflicted or inflicted by others3,4. Trauma to the spine may result in fractures with and without dislocations of the spine, acute injury of inter-vertebral discs, and neurovascular injuries5. Although well protected by bony vertebral encasement and tough muscular and ligament support, yet damage to spinal cord may result, directly by fractures or dislocations of vertebrae or indirectly due to acceleration and deceleration injuries (whiplash injury) resulting in concussion, lacerations, hemorrhage, contusions and prolapsed of spinal cord. Trauma to the spinal cord leads to neurological damage that may affect motor, sensory, visceral, genital and nutritional functions[1].

India is a developing country with traumatic fatalities, like road accidents and falls, on the rise. Accurate mortality statistics from these vices of development are collected in various regions over different periods by researchers [6,7,8]. Such statistics of morbidity and mortality profiles are helpful in recommendations of prevention strategies, improving emergency trauma care, and to frame appropriate services with affordable health packages for their management. No mechanisms of documentation of such statistics including spinal injuries are available at National level in the country. Also, the available literature pertaining to traumatic spinal injuries in medico legal deaths is deficient in this region.

Epidemiological studies are always an asset in planning prevention strategies as well as clinical and community services for persons suffering trauma. They also provide a baseline for monitoring the effectiveness of interventions. Epidemiology of a particular ailment is linked to social, environmental, cultural and biological issues and thus varies over regions and times.

This study was thus initiated in order to observe the pattern of traumatic spinal injuries in medico-legal autopsies of traumatic fatalities at S.M.S. Hospital, Jaipur during the year 2017-18, discuss their causes and their contributions to mortality. An attempt was made to suggest recommendations to clinicians as regards to formulation of more effective diagnostic and management protocols and suggest measures to prevent mortality in cases of vertebral trauma with or without injuries to the spine.

## Aims & Objectives

**Aims**

To study the pattern of traumatic spinal injuries in medico-legal autopsies at S.M.S. Hospital, Jaipur during the study period

**Objectives**

1. To observe traumatic spinal injuries pertaining to region and associated fractures/ dislocations of vertebral column

2. To observe the mode, mechanism, and manner of traumatic spinal injuries.

3. To observe medico-legal and socio-demographic profile of traumatic spinal injuries.

## Material & Method

This study was carried out at the Department of Forensic Medicine, SMS Medical college & Hospital, Jaipur after obtaining due clearance from research and review board of SMS Medical college & Hospital, Jaipur as dissertation of MD Course .

Study type:

Descriptive type of observational study.

Study Area:

Mortuary, Department of Forensic Medicine, SMS Hospital, Jaipur.

Study Period:

One year from 1st April, 2017 to 31st March, 2018

Study Universe:

Medico-legal autopsies conducted at SMS Hospital, Jaipur during the study period.

Cases:

Medico-legal autopsies conducted at SMS Hospital, Jaipur during the study period with traumatic spinal injuries

**Inclusion criteria:**

Autopsy cases of traumatic spinal injuries

**Exclusion criteria:**

1 autopsy cases with incomplete body presented for postmortem examination

2. Cases with traumatic spinal injuries with history of previous pathological conditions of spine.

3. Cases of spinal injuries due to mechanical asphyxia.

4. Subjects with other medical, surgical or metabolic conditions affecting mortality are excluded

**Sample Size**

Sample size was calculated at 95% confidence level assuming prevalence of 75.95% cases with cervical cord injuries as found in reference article at the absolute allowable error of 10% for which sample of 70 cases of medico-legal autopsies of traumatic spinal injuries in medico-legal deaths were required for the present study.

## Method

Detailing of medico-legal information was done on basis of information in the inquest papers and that available from attendants of the deceased. Detailed data were recorded pertaining to the pattern of spinal injuries, region involved, level of spinal injury, duration of survival, isolated and non-isolated spinal injury along with details of associated injuries,

During autopsy, vertebral column was examined from anterior as well as from posterior approach, in different cases. If injuries were observed in the spine, then spinal canal was dissected further to visualize the spinal cord.

**Ethical Clearance :** Taken from research , Review and Ethical committee of SMS Medical College & Hospital, Jaipur.

## Statistical Analysis

The findings were then entered in Microsoft excel datasheet and tabulated for data analysis. Continuous variables were summarized as mean and standard deviation whereas nominal/ categorical variables as proportions. Statistical analysis was then conducted using Medcalc 7.4 version software. Chi square test was used for analysis of nominal categorical variables. P value<0.05 was considered as significant.

## Observations

A total of 3139 medico-legal autopsies were conducted at SMS Hospital, Jaipur during the study period, out of which the total number of autopsies in which spinal injuries were documented were 193 cases but the calculated sample size was 100 cases and after eliminating the cases of fatalities with spinal injuries as per the inclusion and exclusion criteria, a total number of 150 cases were included in the study.

**Table 1: Age group and gender wise distribution of medico-legal fatalities with spinal injuries**

| Age Group | Gender | | Total |
|---|---|---|---|
| | Male | Female | |
| 00-10 | 01 (0.75%) | 02 (11.11%) | 03 (02.0%) |
| 11-20 | 12 (09.09%) | 00 (0.0%) | 12 (08.0%) |
| 21-30 | 34 (25.75%) | 03 (16.66%) | 37 (24.66%) |
| 31-40 | 29 (21.96%) | 06 (33.33%) | 35 (23.33%) |
| 41-50 | 23 (17.42%) | 05 (27.77%) | 28 (18.66%) |
| 51-60 | 23 (17.42%) | 02 (11.11%) | 25 (16.66%) |
| >60 | 10 (07.57%) | 00 (0.0%) | 10 (06.66%) |
| Total | 132 (88.0%) | 18 (12.0%) | 150 (100%) |

Out of 150 cases of traumatic spinal injuries, there were 132 males (88%) and 18 females (12%). The overall male: female ratio was 22:3. Maximum number of fatalities with spinal injuries were observed in 21-30 years age group (24.66%), followed by 31-40 years (23.33%), 41-50 years (18.66%), 51-60 years (16.66%), 11-20 years (8%), and > 60 years (06.66%). Least number of traumatic fatalities with spinal injuries were observed in < 10 years age group with only three cases (02%). There was no female casualty with spinal injuries in 11-20 years and in more than sixty years age group. The youngest female was seven years of age and the oldest one was sixty years of age.

**Table 2: Distribution of cases of medico-legal fatalities with traumatic spinal injuries according to mode of injury (traumatic episode) (n=150)**

| **Mode of injury** | **Number of cases** |
|---|---|
| Road traffic accident | 67 (44.67%) |
| Fall from height | 55 (36.67%) |
| Fall of heavy object | 15 (10.0%) |
| Slip & fall | 09 (06.0%) |
| Assault | 03 (02.0%) |
| Run over by train | 01 (0.66%) |
| Total | 150 (100%) |

Road traffic accidents were the major offenders (44.67%) in the present study followed by falls occurring from same or higher levels (42.67%). 10% cases suffered injuries due to fall of heavy object on the upper body and least fatalities resulted due to injuries inflicted by others deliberately (2%) and railway death (one case- 0.66%).

**Table no. 3 Distribution of cases of medico-legal fatalities with traumatic spinal injuries according to the level of spinal injury and Survival Period**

| **Level of spinal injury** | **Survival period** | | | | **Total** |
|---|---|---|---|---|---|
| | **Brought dead or within 06 hrs** | **06-24 hrs** | **01-07 days** | **>07 days** | |
| Upper cervical | 02 (25%) | 01 (12.5%) | 02 (25%) | 03(37.5%) | 08 (5.33%) |
| Upper & mid cervical | 05(38.46%) | 0 (0.0%) | 05 (38.46%) | 03(23.08%) | 13 (8.67%) |
| Mid cervical | 12(22.64%) | 0 (0.0%) | 23 (43.39%) | 18(33.97%) | 53(35.33%) |
| Mid & lower cervical | 03(09.68%) | 0 (0.0%) | 14 (45.16%) | 14(45.16%) | 31(20.67%) |
| Lower cervical | 04(16.67%) | 01 (04.16%) | 12 (50%) | 7 (29.17%) | 24 (16%) |
| Thoracic | 02(15.38%) | 01 (07.7%) | 04 (30.77%) | 06(46.15%) | 13 (8.67%) |
| Lumbar | 02(33.33%) | 0 (0.0%) | 02 (33.33%) | 02(33.34%) | 06 (4.0%) |
| Lumbo-sacral | 0 (50%) | 0 (0.0%) | 0 (0.0%) | 2 (100%) | 02 (1.33%) |
| Total | 30 (20%) | 03(02.0%) | 62 (41.33%) | 55(36.67%) | 150 (100%) |

Categorizing the spinal injury according to its level, it was observed that there were 129 cases (86%) of cervical injuries, 13 cases of thoracic injuries (08.67%) and remaining 05.33% (08 cases) of Lumbar (06 cases) and lumbo-sacral (02 cases) levels. The cervical injuries were further divided into Upper (C1-C2), Mid (C3-C5) and Lower (C6-C7). Out of 129 cervical injuries, there were eight cases of upper cervical (06.2%), 53 cases of mid cervical region (41.1%), 13 cases involving upper and mid cervical regions (10.2%), 24 cases of lower cervical (18.5%) and remaining 31 cases involving mid and lower cervical regions (24%). Combined, there were 75.2% cases in which the mid cervical region was affected in trauma.

While observing the level of spinal injuries in relation to the survival period, it was found that 50% cases of lower cervical, 45.16% cases with mid to lower cervical injury, 43.39% cases of mid cervical injury, 38.46% cases of upper to mid cervical injuries and 25% cases upper cervical and lumbo-sacral; and 30.77% cases of thoracic injuries died in one to seven day period. 38.46% of upper to mid cervical, 25% cases each of upper and 22.64% cases of mid cervical, 16.67% cases of lower cervical and 09.68% cases of mid to lower cervical were either brought dead or died within six hours. 45.16% cases of mid to lower cervical, 37.5% cases of upper cervical region, 33.97% cases of mid cervical, 29.17% cases of lower cervical and 23.08% cases of upper to mid cervical region succumbed to the injury after a period of one week. 46.15% cases of thoracic injuries died after one week, 30.77% cases died in one day to one week, 15.38% cases died on spot or in six hours and rest 7.7% cases died in six to twenty four hours. In injuries caused to lumbo-sacral region of spine, it was observed that 25% cases each died either on spot or within a week. Rest 50% cases suffered fatality after one week's time. No case of lumbo-sacral injury suffered fatality in six to twenty four hours.

## Conclusion

Spinal injuries were commonly observed in day to day accidents and also displayed reasonable fatality. Fatality resulting from spinal injuries was delayed in most cases thus implying the need for timely and effective intervention for prevention of mortality. There is a need to increase the establishment of specialized spinal injury management centers across the country. Early referral and transfer of patients from peripheries to specialized centers needs to be encouraged for further preventing mortality. Thus, more tertiary trauma care centers should be established with efficient services for spinal injuries.

Steps must also be taken to improve injury surveillance and the quality of data collected. Detailed and relevant studies on larger samples will guide prevention efforts aimed at risk factors in the individual and the environment and provide feedback to trauma care providers. Further monitoring of these trends will influence training, improve the focus of the trauma service and direct the provision of more effective care to these severely injured patients.

## Limitations of the Study

Anything that is perfect is dead. The thesis/ dissertation is alive due to its limitations. No scientific study is ever over without limitations. Postmortem studies arguably have additional limitations. There are multiple confounding factors which need to be considered.

1. All the above data was recorded as per available information and medico-legal examination but was not cross tallied with police investigation records.

2. The data recorded was on the basis of Hospital records and verbal questionnaire and history given by attendants of the victim or deceased.

3. The study is limited to the outcomes of the incidence. Due to lack of interview with the persons available at the site of incidence, the factors that contributed to the cause of trauma is unknown and hence not included in the study.

4. Limited sample size and minimal detailing for few variables.

5. Spinal cord dissection was carried out on autopsy in cases with observable vertebral injures, thus missing out cases of spinal cord trauma without injury to bony encasement.

## Recommendations

I. RECOMMENDATIONS FOR THE TREATING DOCTORS TO PREVENT THE MORTALITY IN SPINAL INJURIES

All the cases of trauma must be properly evaluated for spinal injuries and promptly managed to prevent mortality and morbidity.

Preventive measures like intermittent catheterization, aseptic procedures in setting up intravenous line, chest physiotherapy and pulmonary toileting to reduce mortality from sepsis.

Special care and attention should be given and frequent turning of patients must be done to prevent bed sores help to prevent bed sores and other complications leading to death due to septicemia and multi organ failure.

Regional Tertiary case specialized Spinal injury centers should be established and early referral of cases with Traumatic spinal injuries should be encouraged to such specialized centers to reduce mortality in these cases.

**III. RECOMMENDATIONS TO DECREASE THE INCIDENCES OF TRAUMATIC SPINAL INJURIES**

high speed vehicles should be with well equipped safety measures.

High speed interceptors should be installed at all major roads and highways.

Bikers should be made aware about the safety gears and sensitized beyond just traffic mandatory gears.

Extended neck protection helmets should be promoted for sale by subsidy and promotional money awards.

Substance abuse while driving and pedestrian use should be discouraged.

Workers should be educated about basis safety standards and equipment like ropes and harnesses to be used while cutting trees, working on high rise buildings and under construction projects.

Preventive measure must be compulsion on heights for people at risk.

**Conflict of Interest :** None declared

**Source of Funding :** Self

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# An Analysis of Trends of Homicidal Deaths in Western Mumbai Region

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## Abstract

**Background:** The present study conducted for evaluation of trends in homicidal deaths with references to study the specific parameters of homicidal deaths like incidence of homicide, socio-demographic profile of victims and type of weapon used for homicide in western Mumbai region over the period of two years.

**Method:** Study was conducted in department of forensic medicine of H. B. T. Medical College & cooper Hospital, Mumbai for period of 2 years from January 2015 to December 2016. Total 3114 of autopsies were conducted during the period of which 66 (2.11%) were of homicidal deaths.

**Result:** Present study found homicidal deaths accounted for 2.11% of autopsies conducted in study period. Predominance of male victims (54.5%) seen over female victims (45.5%). Maximum number of victims of homicide were in the age group of 21-40 years (60.6%). Most of homicides took place at victim 's residence 45.45%. Arguments (45.45%) were found to be most common motive behind homicide. Hard and blunt weapon (39.4%) is commonest type of weapon used.

**Conclusion:** The trends of homicides are varying from region to region. In most of cases the victims are well acquainted with accused and most common place of crime was victims own house all these findings indicated that homicides were as result of arguments and scuffle between them. The victims in this young age group are more aggressive and less tolerant, proper anger and stress management through the psychiatry counselling of this age group may lower homicide rate.

***Key words:*** *homicide, autopsy, arguments, hard and blunt weapon.*

## Introduction

Homicide is the killing of human being by another human being .There are two types of homicides i) lawful which includes excusable and justifiable homicide ii) unlawful or culpable homicide(sec.229 of IPC) which includes culpable homicide amounting to murder(300 of IPC)and culpable homicide not amounting to murder(304 of IPC).[1] To constitute the offense of murder the two elements are i.e. Mens rea means guilty mind or preplanning with afore thought and actus reus means actual execution of planning are essential. While in offense of culpable homicide not amounting to murder the first component of preplanning i.e. mens rea is absent. The offense of culpable homicide not amounting to murder is often committed by sudden and grave provocation during the scuffle or arguments.[2]

The Mumbai western suburbs have population approximately 6.2 million. There are various offenses affecting the body like rape, attempt to murder, grievous hurt, abetment of suicide, kidnapping etc. of which homicide is most heinous crime against the body known to mankind right from old civilisation to present day. It has grave implication on society. The detection and separation of such offender from society is matter of

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vital importance for maintaining safety and security in the entire society. The identification of profile of risk factors of victim of homicide may prevent or reduce the rate of homicide. Therefore, this study was conducted to evaluate the incidence and trends of committing homicides for the cases which are brought to autopsies at department of forensic medicine at H. B. T. College, Mumbai for period of two-year 2015 and 2016.

## Material and Method

The present prospective study is conducted in the department of forensic medicine and toxicology at H.B.T. medical college for the period of two years i.e. 1st January 2015 to 31st December 2016. The data includes cases of homicide referred for post mortem by police station from western Mumbai (western suburbs) region which comes under the jurisdiction of H. B. T. medical college.

**Inclusion criterion:**

1. All case investigated by investing officer under 302 of IPC.

2. The cases with no history of homicide at the time of death but turned to be homicide after autopsy.

**Exclusion criterion:**

1. Cases of infanticides.

2. Custodial (judicial and police) homicides.

The proforma was prepared with different parameter used in study like age, sex, occupation marital status, place of incidence, survival period, motive, accused – victim relation and weapon of offense. The information about the socio-demographic profile of cases was obtained from police inquest, ADR forms, statement of relatives of victims, hospital papers and history obtained from relative, friends accompanying with deceased person. Details of crime scene are obtained from crime scene visit or photographs of crime scene.

## Result /Observation

**Table 1: Total number of autopsy and its relation to homicide autopsies**

| Period | Total autopsies | Homicidal autopsies (%) |
|---|---|---|
| Jan 2015-Dec 2015 | 1524 | 35(2.3) |
| Jan 2016-Dec 2016 | 1590 | 31(1.9) |
| Total | 3114 | 66(2.11) |

Total 3114 autopsies were conducted in period of 2-year Jan 2015- Dec. 2016 out of which total 66 (2.11%) cases were of homicide.

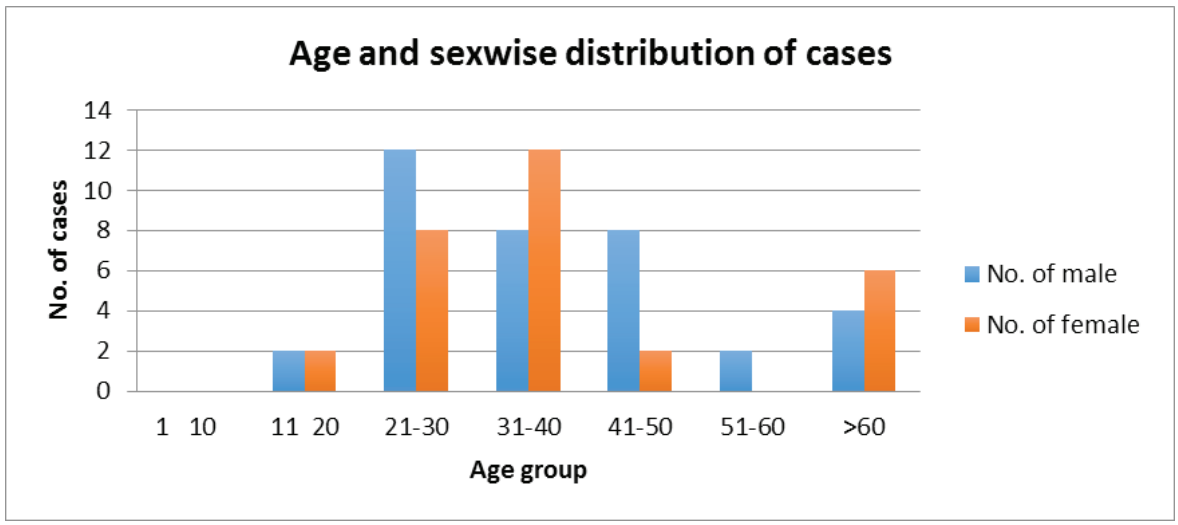



**Chart 1: Distribution of victims according to the age and sex.**

The study reveals the predominance of male victims 36(54.5%) over female victims which account for 30 cases (45.5%). Maximum and same number of victims each 20 cases (30.30%) were found in the age group of 21-30 and 31-40. Victims less than age of 1 year (infanticide) is excluded from study. No case of homicide is reported in age group of 1-10 years. 60.6% homicides were occurred in age group 21-40 years, however least numbers of victims were in the age group of 51-60 years 2 (03.03%).

**Table 2: Socio-Demographic profile of victims**

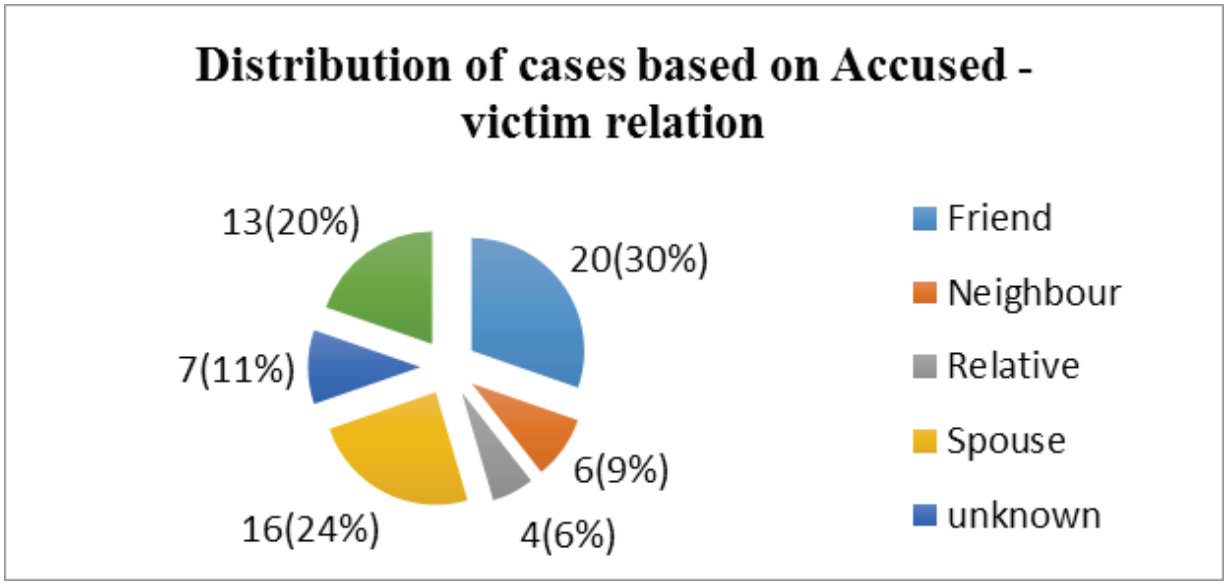
| **Occupation** | **Number of cases** | **Percentage** |
|---|---|---|
| Student | 6 | 09.09 |
| Housewife | 12 | 18.18 |
| Labourer | 8 | 12.12 |
| Salaried/job | 16 | 24.24 |
| Own business | 13 | 19.69 |
| Acting | 4 | 06.06 |
| Retired | 7 | 10.60 |
| Marital status | | |
| Married | 41 | 62.12 |
| Unmarried | 19 | 28.78 |
| Divorcee | 2 | 03.03 |
| Widow/widower | 4 | 06.06 |
| Place of incidence | | |
| Victims house | 30 | 45.45 |
| Assailant house | 10 | 15.15 |
| Remote place | 12 | 18.18 |
| Work place | 8 | 12.12 |
| Street | 6 | 09.09 |

It was observed that most of victims 16 (24.24%) belongs to occupation of salaried /job either in government or private sectors followed by victims with own business 13 (19.69%). Housewives accounts for 18.18% cases.

Majority of victims of homicides were married and accounts for 62.12% (41) cases. Unmarried victims accounts for 28.78% cases. Widows/widower accounts for 6.06% cases and divorcee accounts for 3.03% cases.

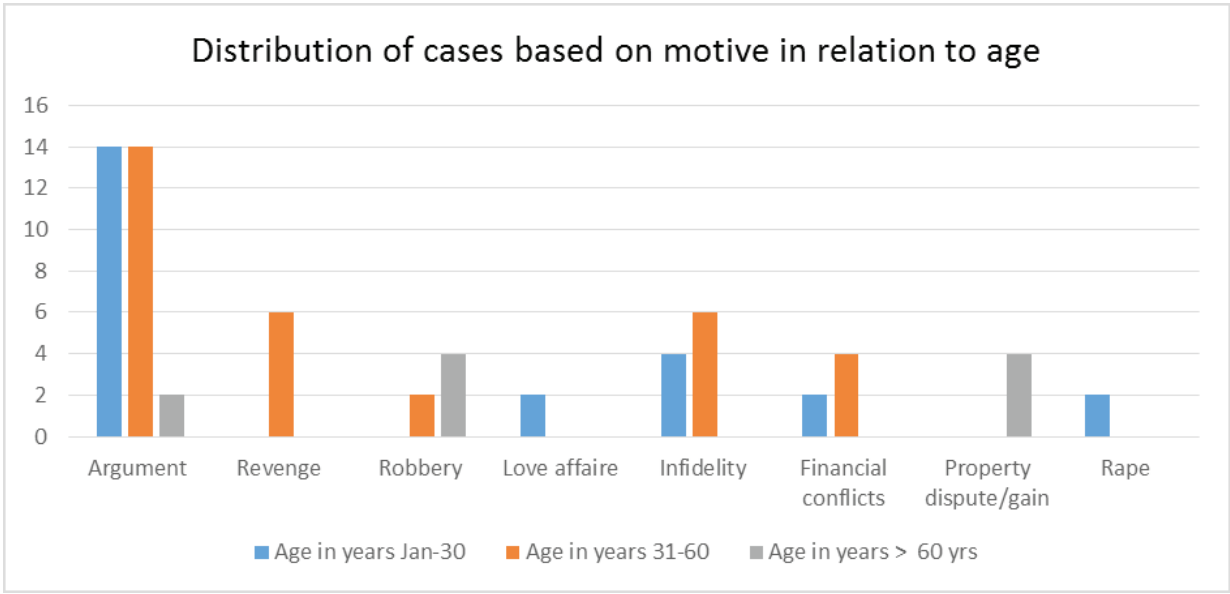
The commonest place for the homicide observed was victims own house 30 (45.45%) followed by remote place 12 (18.18%) and assistant house 10 (15.15%).

Chart 2: Distribution of homicide according to accused victim relation.




It was observed that in majority of cases accused was friend 20(30%) followed by spouse 16(24%) of victim. Relative 4(6%) of victims were found in least cases.

**Chart 3: Motive wise distribution of victims in relation to age:**




Arguments were most common motive behind the homicide, followed by Revenge, robbery, and financial conflicts which constitutes 9.09% each. Argument is most common motive in young age group (1-30 years) which comprises of almost 58.33% of cases. However, the robbery and property gain were comprising of 40% of cases each in old age group (>60 years)

**Table 3: Type of weapons used in cases**

| Sr. No. | Type of weapon | No. of cases | Percentage |
|---|---|---|---|
| 1 | Sharpe edged | 24 | 36.36 |
| 2 | Hard and blunt | 26 | 39.39 |
| 3 | blunt weapon + Sharp | 2 | 3.03 |
| 4 | Ligature material | 10 | 15.15 |
| 6 | Ligature + manual Strangulation | 2 | 3.03 |
| 7 | Thermal burn | 2 | 3.03 |
| 8 | Total | 66 | 100 |

Hard and blunt weapon is most commonly used weapon of offense and observed in 39.39% cases, followed by sharp edged weapon in 36.36% of cases. In 3.035 cases both sharp edged and blunt weapon was used.

## Discussion

During the study period total 3114 autopsies were conducted of which 66 were of homicide accounting 2.11% of total autopsy done over period of two year i.e. Jan 2015 to Dec 2016. Findings of our study were consistent with study of Shailesh Jhaveri , Sandip Raloti et.al study 2.31% in the city of Surat 3 , Dhaval J. Parmar, Love R. Bhagora et.al 2.4%. In Bhvanagar city 4 and some extent to study of Prashanth Mada, P. Hari Krishna where homicide comprises of 3.24% of total autopsies in Hydrabad region5, study of Dr. Basappa S. Hugar, Dr. Girish Chandra Y P et.al 4.32% conducted in Bangalore region.6 However findings are in contrast with Sachidananda Mohanty, Sujan Kumar Mohanty et.al. study where homicides constitute 6.9% of homicides[7], B. C. Shivakumar study 4.76% 8and Ashok K. Rastogi study 4.25%. 9 These differences are due to variation in geographical and development of different region of India. Percentages of homicides are more in southern region in comparison of western region of India.

Our study shows predominance of male victims (54.5%) which is consistent with Sandip Raloti3, Dr. Basappa S. Hugar [6], Dhaval J. Parmar 4, B. C. Shivakumar study8 Prashanth Mada5 Sachidananda Mohanty7 and Ashok K. Rastogi study.[9]

The most important finding of the study is the commonly affected age group of victims, 21-30, 31-40 years and each contributes for 30.30% of cases which together comprises for 60.60% cases. Findings of our study Correlates with other studies such as, Sandip Raloti3, Dhaval J. Parmar4, Prashanth Mada5, Dr. Basappa S. Hugar6, Sachidananda Mohanty7, B. C. Shivakumar study8 and Ashok K. Rastogi study9. In all these studies there is predominance of victims of age group 21-40 which comprises of more than 60% of cases. The high incidence of cases in the age group of 21-40 may be due to person in this age group are more aggressive, short tempered and least tolerant which leads to arguments and scuffle and ultimately end to crime of homicide. The study shows overall predominance of male victims which is consistent with study of Sandip Raloti, Prashanth Mada5 Basappa S. Hugar6, Sachidananda Mohanty[7], Dhiraj Buchade[10].

Present study reveals the most common place of occurrence of homicidal attack was the victims own house 45.45% which indicates that most of homicides accused and victims were closely related with easy access to victim's home. The victims and accused were well acquainted with each other. The findings were similar to study of Prashanth Mada[5] and Dr. Basappa S. Hugar[6]. Argument and scuffles between accused and victims was the most common motive found in this study (45.45%). The most common motive of homicides scuffle and arguments indicates that homicides were not predetermined and planned. The arguments and scuffle with sudden and grave provocation leading

to death of victims. The findings were consistent with study of Prashanth Mada5, Ashok K. Rastogi9, However, inconsistent with study Basappa S. Hugar6, Sachidananda Mohanty7 and B. C. Shivakumar study 8 which reveals the enmity /revenge as common motive behind the homicide.

The present study found commonest type of weapon used in homicides was hard and blunt weapon (39.39%). The findings were consistent with study of Prashanth Mada5, Ashok K. Rastogi 31.7%9 Dhiraj Buchade et.al 37.2% 10. Where common weapon of choice was hard and blunt weapon. Use of only hard and blunt weapons for homicide could possibly be unpremeditated/ unplanned aggressive/ explosive response of person to sudden and grave provocation in arguments primarily. These hard and blunt objects were easily available. The findings were contrast with Dhaval J. Parmar et.al.4, Basappa S. Hugar6, Sachidananda Mohanty7, and B. C. Shivakumar8 where the common weapon of choice was sharp and pointed weapon. However, the studies of Basappa S. Hugar6 Sachidananda Mohanty7 and B. C. Shivakumar8 also shows contrast in motive of homicide which was revenge/enmity. Exclusive use of sharp-edged weapon observed in (36.36%) homicidal cases. The use of only sharp-edged weapon points towards premeditated/planned crimes with motive of robbery, revenge or property dispute.

## Conclusions

The trends of homicides are varying from region to region. The social and demographic factors are affecting the crime of homicide.

Most common age group involved in homicide was 21-40 years 60.60%, the victims are well acquainted with accused and most common place of crime was victims own house all these findings indicated that homicides were as result of arguments and scuffle between them. The victims in this young age group are more aggressive and less tolerant, proper anger and stress management through the psychiatry counselling of this age group may lower homicide rate.

The sharp and pointed weapon was used as weapon of choices in planned homicide with motive of revenge or robbery. However hard and blunt weapon was used as weapon of choice in unplanned/ unpremeditated homicides as easy availability of these weapons.

**Ethical Clearance-** Taken from institutional ethics committee at H. B. T. Medical College Mumbai.

**Source of Funding**- Self

**Conflict of Interest**- Nil

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*Original Research Article*

# Evaluation of Perception of II Year MBBS Students Regarding A Clinical Forensic Medicine Module in a Tertiary Care Centre

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## Abstract

**Background:** Besides providing treatment to patients in medico legal cases, a competent medical practitioner is legally bound to collect all necessary evidence material from the body of patients which may help in the investigation of the crime and to aid in the court of law towards justice. In India, the current practice of theoretical teaching of students in Forensic Medicine towards handling medicolegal cases is not enough to deliver clinical skills effectively in handling medico-legal cases.

**Aims & Objectives:** This study was undertaken with objectives to evaluate students perception on Clinical Forensic Medicine and impart them a hands on training towards handling antemortem medico legal cases.

**Material & Method**: It was an educational interventional study, including 125 second MBBS undergraduate students. At the end of module, the students' responses towards educational project on Clinical Forensic Medicine were collected in the form of a pre-validated questionnaire template.

**Results & Conclusion:** About 52 % students responded as agreed and 29 % strongly agreed with the questionnaires at the end of this module. Students favoured Clinical Forensic Medicine Module as an effective teaching/learning method to learn on the basics of handling medico legal cases.

***Keywords:*** *Case based teaching, Medico legal cases, Clinical Forensic Medicine.*

## Introduction

The current practice of teaching Forensic Medicine to students in India is not able to deliver effectively clinical skills in handling medico-legal cases is a matter of concern1. As per section 39 of Criminal Procedure Code of India, any person who is aware of the commission of an offense by any person in relation to the human body is bound to report such commission of offense to the law enforcement authorities i.e. the police or the magistrate[2].

A medical practitioner is constantly exposed to such information about the commission of a crime as they are in a position to treat patients who are suffering due to crime committed by any person. Apart from conveying this information to the police/magistrates, a medical practitioner is also legally bound to collect all necessary evidence material from the body of patients which may help in the investigation of the crime. It is the discretion and the duty of a doctor to judge a medical case and to assess whether there is a possibility of any crime or not.

Legal court may sometimes refer cases to a medical doctor for the purpose of identification, age estimation, etc.; such cases are generally identified as Clinical Forensic Medicine cases. The training of handling of such medico-legal and clinical forensic medicine cases is given to a medical student during the second year of the MBBS course.

It can be argued that second-year MBBS students may lack awareness about the importance of learning to handle medico-legal cases, probably due to non-exposure to emergency cases at that time. Hence, a dedicated module to teach clinical forensic and medico-legal cases to second-year MBBS students along with hands-on training can impart them with skills required to deal in such cases. It is essential that opinion of one of the main stakeholders that is the students towards this module be taken to assess the usefulness and impact of this module.

## Objectives

This study was undertaken with following objectives:
1. To evaluate students perception on Clinical Forensic Medicine.

2. To impart a hands on training to undergraduate students towards handling antemortem medico legal cases.

## Methodology

Study type: Educational interventional study.

i. Protocol was submitted to Institutional Ethics Committee & IEC Permission will be taken.

ii. Study volunteers: The second undergraduate students of Seth GSMC & KEMH were included in this project. The written informed consent of participants was taken.

iii. Inclusion criteria: The students giving consent voluntarily were included in the study.

iv. Exclusion criteria: First & Third year MBBS students were not included in the study.

v. Study variables: questionnaire with Five point Likert scale used for assessment.

Vi. Faculty were trained specifically for this module to conduct training sessions.

vii. Training sessions:

For the teaching of undergraduate students in Clinical Forensic Medicine, the broad goal is to have the knowledge, skills and behavioral attributes to function effectively as the first contact Medico-legal experts. This course introduced the systematic instruction to undergraduate students in the principles and practice of Clinical Forensic Medicine, including medico legal cases of age & injury by way of lectures, practical demonstrations on subjects or video. In the project, 125 undergraduate students of Seth GSMC & KEMH were taken into consideration with voluntary will to participate. The written informed consent of participants had been taken. Besides lectures, video demonstrations, they were subjected to hands on training in small groups towards handing medicolegal cases such as age & Injury and training given towards preparation of medicolegal reports & expert opinions to investigating agencies.

The project had been completed for the MBBS undergraduate students with 125 students. The batch of 125 students divided in the groups of 25 to 30 students for small group demonstrations. The module was applied to this batch to all participants. The students' responses towards educational project on Clinical Forensic Medicine were collected in the form of a pre-validated questionnaire template.

The perception of students collected in a questionnaire form containing 20 questions viz. I found the teaching method enjoyable; The questions stimulated me to think; The discussion aroused curiosity about the topic & generated lot of new ideas; The method was a useful way to understand the topic; I think the role of teacher as facilitator is important in this method; I was attentive throughout this class; I am rarely bored throughout this course; I am able to memorize what I need; The teaching method facilitated my participation; I found the method to be good for clearing doubts which I had after the initial lecture; Much of what I have to learn seems relevant to a routine clinical medical practice; The teaching method will help me in applying the knowledge in my clinical practice; The programme develops an understanding of application of Clinical Forensic Medicine in clinical practice; It creates interest in subject; The course helps to perform better in University Examination; I would like all practical topics to be covered using the same method; I found the course relevant; I satisfied with the level of my Participation; Case based training in Clinical Forensic Medicine is need of hour; Teaching made us confident towards handing medico legal cases more competently; respectively. The responses were 1-strongly disagree, 2- Disagree, 3- Uncertain, 4- Agree, 5-Strongly agree. The data collected was analyzed.

## Results

About 52 % students responded as agreed and 29 % strongly agreed with the questionnaires of this module [Table 1]. There were 16 % students who were not able to decide whether this module is going to improve their medico-legal knowledge and its use in clinical practices [Table 1].

**Table 1: Overall Students response to Questionnaire**

| Score | OVERALL SCORE | | Percentage (%) |
|---|---|---|---|
| 1- SD | STRONGLY DISAGREE | 13 | 1 |
| 2-D | DISAGREE | 60 | 2 |
| 3-U | UNCERTAIN | 389 | 16 |
| 4-A | AGREE | 1312 | 52 |
| 5-SA | STRONGLY AGREE | 726 | 29 |
| | Total | 2500 | 100 |

For most of the question response for students were either agreed and strongly agreed [Figure 1, 2, 3 and 4] for Clinical Forensic Medicine module as a method of teaching medico-legal aspects and for the method used to deliver this module by video clips and small group case discussion in addition to Lecture. The graphical representation of participant's responses to questionnaire 01 to 20 was shown in figure 01 to 04.

**Figure 1: Proportional Bar Diagram presenting Response Distribution for Q1 to Q5**

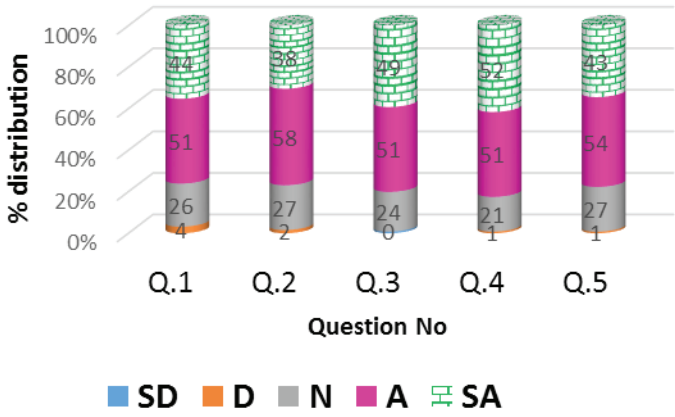



**Figure 2: Proportional Bar Diagram presenting Response Distribution for Q5 to Q10**

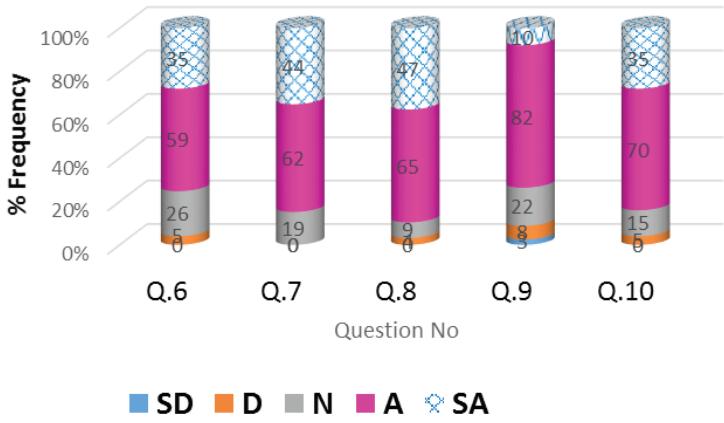


**Figure 3: Proportion Bar Diagram presenting response Distribution for Q11 to Q15**

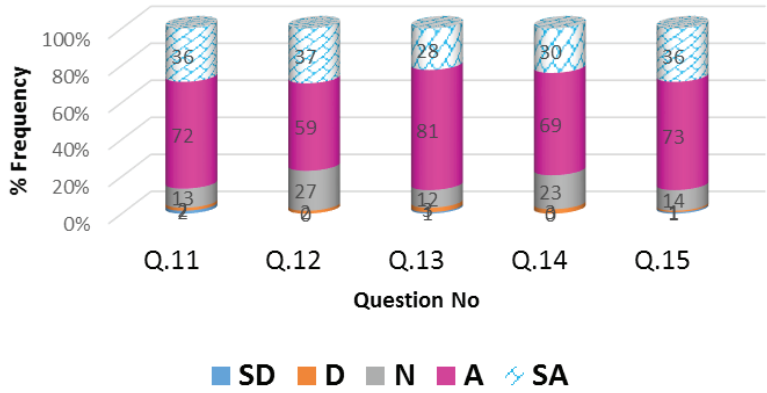
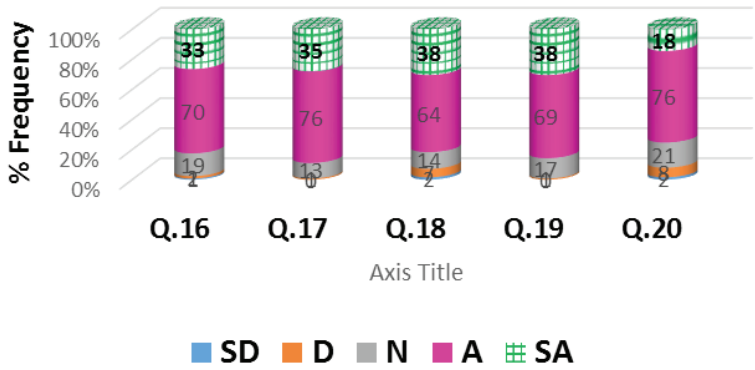



**Figure 4: Proportion Bar diagram presenting response Distribution for !16 to Q20**




## Discussion

Division of Clinical Forensic Medicine is a recent entity which deals with practice of physically examining and assessing a living person who is alleged to be a victim of assault or assessing the alleged culprit of the crime. It includes participation from various other departments such as pharmacology and criminology[1,3].

One of the core competencies of an Indian Medical graduate as per Medical Council of India is that they should know to describe the importance of documentation in medical practice in regard to medico-legal examinations, Medical Certificates and medico-legal reports1. This would include being able to make observations, carry out proper physical examination (Medico-legal) and documentation/reporting of a living person alleged to have been injured as per prescribed and accepted format. He should have knowledge of preservation of relevant biological and also be able to estimate Age for certification. However, until recent past this essential information was delivered in Forensic Medicine through Lectures. However, a shift in teaching system has been initiated world-wide with transition towards an active learning format for delivering such information. Clinical Forensic Modules is a way forward to enlighten students on these aspects which is usually done in small group with discussion on a case scenario or video clipping or clinical rounds. Currently in India, Program on Clinical Forensic Medicine in which evaluation of a living victim is carried out by trained medico legal person has not evolved and also not implemented everywhere[1].

It has also been found that Physicians involved in assessment and treatment of victims of violence or accidents have minimal or no training in forensic aspects of trauma. This would result in overlooking of evidence and sometimes loss of evidence as it would

have been discarded4. Another important skill required is appropriate documentation of evidence which would assist Pathologists, police and legal authorities in the forensic aspects of an investigation5.

It is expected from a medical graduates performing physical examination to be well versed with basic forensic skills to handle medico legal cases. Therefore, this study was undertaken to apply principles of active learning and assess students satisfaction on their learning experience with this Clinical module.

In the present study most of the students (81%) had a good learning experience with this module with reference to enjoyable experience, stimulation to learning, and aroused curiosity about topic. Students who participated in this Clinical module study found the delivery of method useful to understand the topic better. In addition, Students opined that Clinical module and active participation helped them in memorizing and clearing of doubts. Learning seemed to be relevant to them for a routine clinical medical practice and also helped them in applying the knowledge in clinical practice programme. This method developed an understanding in them of application of Clinical Forensic Medicine in clinical practice.

Students felt they can perform better in university examination if they are trained by this module. An acceptance to this module by students encourages implementing this Clinical module as students understanding would improve and will make them competent in Clinical application of Forensic Medicine in medico-legal cases.

More than 80% students (either agreed or strongly agreed) that practical should be covered by this method. Case based training in Clinical Forensic medicine is need of hour, and teaching by this method has given them confidence to handle these medico legal cases. It is essential to take opinion from students too as they are main stakeholders when we design or implement Programs which are not a routine. In this study it was welcoming feature to note students wanted case based learning for other modules as well.

In a relatively similar study done on II MBBS students by Mohite et al revealed comparable results. They concluded in their study that reframing of curriculum with introduction of Clinical posting in Forensic Medicine is need of hour for enabling medical graduate with skills of handling medico legal cases6.

Ingole et al in their study on early Clinical exposure to medico-legal cases documented that implementation of this critically designed module, definitely improved knowledge and skills of students.[7] They discussed that Clinical Posting should start in 4 and 5th semester and have casualty Posting of Interns under forensic Medicine as compulsory which is currently optional in India7.

Overlooking of evidence or errors in documentation due to ignorance by physician may weaken the case for innocent and offers easy escape for the guilty. Hence, medical practitioner must have an adequate knowledge of documentation, policies and dealing of such cases. Solution to this essential lacuna would be routinely training medical students by Clinical Forensic Medicine Module through active learning for topics that requires them to have good knowledge and skills in handling medico-legal cases.

It is hoped that implementation of Clinical Forensic Medicine Program will give an opportunity to the present staff of Forensic Medicine to teach students all clinical medico-legal aspect in an efficient way. This will help definitely to improve the medico-legal examination and medico-legal report writing.

## Conclusion

Students favoured Clinical Forensic Medicine Module as an effective teaching/learning method to learn basics of Medico-legal issues and protocols for them to perform efficiently in Professional examination and also as Medical graduates in future. The approach and tool used in this Module for teaching principles and practice of Clinical Forensic Medicine, including medico legal cases of age & injurywas accepted by students as a good learning method and hence this study demonstrates students acceptance towards active learning method for better understanding of medico-legal issues.

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# A Retrospective Study to Determine the Type of Offence Committed by the Juveniles in the Reformatory Schools of a Capital City of India

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## Abstract

**Background:** Juveniles of today will become the adults of tomorrow, the face of the world. Hence, it is of utmost importance to make sure that the youth of nation are given a wholesome protected environment to thrive and grow in. Aim of the Study: Our study was focussed on retrospectively studying the type of offence committed by the juveniles in the reformatory schools. Material & Method Both male and female inmates of the reformatory schools were studied for the unlawful acts which landed them into the Reformatory schools. Observation & Results: The percentage of boys and girls involved in non-heinous and other offences was 36.5% and 33.3% respectively; but this association of type of offence with gender was found to be statistically non-significant ($p>0.05$).There were 103 cases of sexual offences, maximum Cases were of POCSO. Conclusion: Comprehensive violence prevention plans in all spheres of life, i.e. homes, schools, communities to reduce and prevent juvenile delinquency. Special programmes should be designed to prevent sexual reoffending among these juveniles. Development of facilities for counselling and psychological and psychiatric treatment as well as introduction of Juvenile mentoring programs is highly recommended in reformatory schools.

***Keywords:*** *Juvenile delinquency, Comprehensive violence prevention plans, sexual reoffending, Juvenile mentoring programs.*

## Introduction

Juveniles of today will become the adults of tomorrow, the face of the world. Hence, it is of utmost importance to make sure that the youth of nation are given a wholesome protected environment to thrive and grow in. As we are all aware that children come under one of the most vulnerable groups of societies which makes them more prone towards risk of many social evils. Hence it should be considered a priority to provide them with a protective environment with adequate loving care for their appropriate growth and development.[1] According to many studies on adult law offenders, it has been found that they had a history of being a juvenile offender in their teenage[2,3]. It has been recommended that the juvenile delinquents should be given special care and there psychological and risk assessments should be done to prevent recidivism in future.[4,5]

The main purpose of this study is to find out violence assessment of juvenile delinquents. We also wish to address the juvenile related factors associated with violence risk. These results could be utilised by health professionals to initiate appropriate treatment either via psychotherapy or counselling for averting violence episodes and crime prevention in future.

Persons, who have not attained eighteenth year of age at the time of commission of offence, are tried as juveniles under the law. The sentences are comparatively lenient and the major focus is given to rehabilitation to make these child offenders good citizens of the future. The children and adolescents can be reformed by proper nurturing and providing the right guidance. Juvenile Delinquency in India is a major problem. Some research has been done in this sphere, to understand and effectively deal with the situation.

Our study was focussed on retrospectively studying the type of offence committed by the juveniles in the reformatory schools. The purpose behind this study is to assess the causative factors behind the unlawful acts of juveniles and to assess the current psychological state of the juveniles.

## Material & Method

We had conducted this study on the juveniles of government Reformatory schools in the capital city of Lucknow (Rajkiya Bal Sudhar Grah boys and Rajkiya Bal Sudhar Grah, Girls,Barabanki). All the willing inmates who gave their consent for participation were included in our study. Both male and female inmates of the reformatory schools were studied for the unlawful acts which landed them into the Reformatory schools. The data collection was done in a phased manner. Permission was taken from the concerned authority, i.e. the Juvenile Justice Board Magistrate to meet and interview the juvenile inmates.

All the collected data was analysed in the form of tables and charts. The inmates were divided in two groups i.e. below 16 years of age and above 16 years of age. The type of offence committed whether non-heinous crime or a heinous crime was recorded. The number of inmates who were involved in sexual crimes was also noted separately. Presence or absence of drug abuse was also noted. The type of addiction and age of onset was asked.

## Observations and Results

**Table-1:Division into two groups-total 126 boys, girls 42**

| Serial no. | Age of Juvenile | Boys | Girls |
|---|---|---|---|
| 1 | Age <16 | 46 (36.5%) | 7 (16.7%) |
| 2 | Age >16 | 80 (63.5%) | 35 (83.3%) |
| | Total | 126 | 42 |

The percentage of boys aged <16 years and >16 years was 36.5% and 63.8% respectively, and the percentage of girls aged <16 years and >16 years was 83.3% and 16.7% respectively. The percentage of boys aged <16 years (36.5%) in remand home was significantly higher ($p<0.05$) than girls aged <16 years (16.7%).

[chi-square test]

**Table-2:Type of Offence**

| Serial no. | Type of offence | Boys | Girls |
|---|---|---|---|
| 1 | Heinous offence | 77 (61.1%) | 28 (66.7%) |
| 2 | Non heinous offence* | 48 (38.1%) | 14 (33.4%) |
| 3 | Others* | 1 (0.8%) | 0 (0%) |
| | Total | 126 (100%) | 42 (100%) |

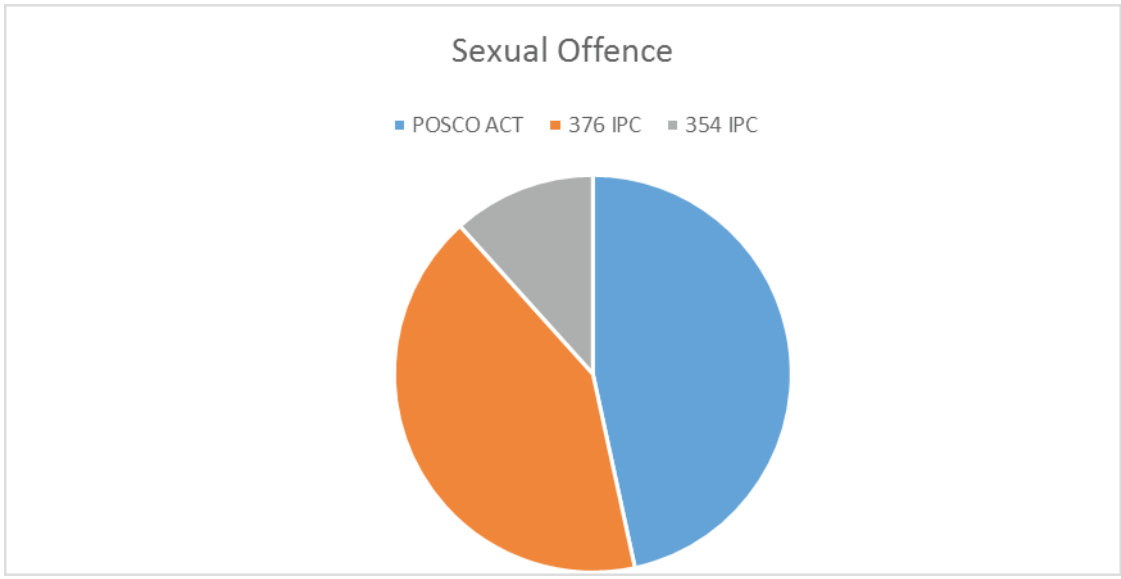
* These groups were merged for statistical purpose.

The percentage of boys and girls involved in non-heinous and other offences was 36.5% and 33.3% respectively; but this association of type of offence with gender was found to be statistically non-significant ($p>0.05$).

[chi-square test]

**Table-3: Sexual offence**

| Serial no. | Sexual offence | Cases |
|---|---|---|
| 1 | POCSO Act | 48 |
| 2 | 376 IPC | 43 |
| 3 | 354 IPC | 12 |
| | Total | 103 |




## Discussion

Our study reveals that the major part of the population of juvenile offenders in remand homes belong to the age group of older than sixteen (63.49%). This finding is significant as it may point towards the increasing tendency of older adolescents to commit crimes. The reasons may vary. Increased testosterone levels in this age group may contribute greatly to the tendency to commit violent and sexual crimes. Greater levels of testosterone have been linked to aggression by various studies.[6,7,8,9] Dominating behaviour may also be a result high testosterone.[10,11] The greater rate of crimes in this age group may also be due to association with adult criminals.

73.57% of the female inmates are older than 16. Some of the girls were even eighteen years old and one of them was twenty-one. These findings indicate the same trend of increasing rates of crimes in older adolescents. It was also observed that the age group of older adolescents committed more violent and heinous crimes than the younger population, including murder and assault. The rising aggression in older females could be due to hormonal changes. The younger population in general committed relatively minor crimes like theft and fraud.

The juveniles belonging to more affluent sections have mostly been arrested under the charges of rape. Many of them were in consensual relationships. This is a very typical scenario in the present age where advantage of existing archaic laws is taken for personal revenge. Despite engaging in sexual activities with full consent, the boy was found guilty of rape as the legal age for consent is 18. Perhaps it is indeed time to review and change the legal age of consent. The ages of attaining puberty in general have been declining indicating earlier onset of puberty.[12,13,14,15] In addition, trends of increasing age of marriage and westernization and liberalization of attitudes towards sexual relationships lead to greater number of teenage relationships. The dynamic, changing attitudes of the society must be contemplated and laws be amended.

A whopping 61.11%of the male juveniles and 66.67% of female adolescents have committed heinous crimes, which are crimes so grave that they have to be tried in courts as adults. These include rape, murder etc. This disturbing observation raises various questions. What causes children and adolescents to commit such grave crimes? Can this be predicted or prevented? 10% of boys were booked under the POCSO Act and 34.13% under IPC 376, rape. The alarmingly high number of sexual offenses including child rape may be because of increasing sexualization of youths in films and media, easy access to pornographic material and repression of sexuality in the Indian culture. Hormonal levels may also be at blame as studies have linked violent sexual crimes and repeated sexual offences to high levels of testosterone [16] . In the rural settings, penetration of internet and quick, effortless access to pornographic films and violent videogames may be at blame. Sex is considered a taboo and society refuses to discuss it, but it

needs to be openly talked about to create awareness and propagate information. Lack of sensitization towards the opposite gender may also be at blame. The current trends regarding violent sexual crimes are discerning. Various studies provide solid evidence suggesting increase in chances of violence and aggression amongst youngsters due to violence in media. This may be due to the tendency of youngsters to emulate observed behaviour. The research by Anderson et al emphasises the link between media and violence.[17]

An extremely disturbing trend observed was the massive number of female juveniles convicted for murder. 45.25% of the girls had committed murder. The reasons for this finding are not properly understood. This must be delved into and studied deeply by further research. Some girls may get involved in romantic relationships and try to elope. When objected by parents and other people they may commit murder due to anger and frustration. Many female inmates have been arrested under Dowry Prevention Act, Section 498 IPC for cruelty to wife by husband or relatives and Section 304 B for dowry death. The girls arrested under Section 498 are mostly sister in laws that get entangled in the family altercations.

Some inmates showed recidivism, they were arrested many times for various offences. These individuals must be given special attention and the underlying causes should be assessed. Upon offering proper guidance, we can come a long way in preventing future crimes. By providing education and vocational courses, social support and rehab facilities, we can effectively reduce the recidivism rates. The stigma attached to convicts need to be eliminated to ensure their assimilation into the mainstream society and rehabilitation.

An important aspect to be looked into is the mental health of the juveniles. It is difficult for these teenagers to stay away from their families and homes. The lack of familial support at this crucial time is very difficult for the juveniles. The contribution of family in the mental health of juveniles cannot be overlooked.18 The Company of other convicted adolescents especially for violent and aggressive crimes, may not be very welcoming. A strong supportive network is extremely essential for maintaining good mental health. The remand homes must strive to provide a nurturing and fear free environment for growth and wholesome development of the juveniles.

## Conclusion

We suggest appropriate measures should be taken to prevent youth victimization and violence, which should include comprehensive violence prevention plans in all spheres of life, i.e. homes, schools, communities. This will definitively reduce as well as prevent juvenile delinquency. Special programmes should be designed to prevent sexual reoffending among these juveniles. They should be provided with appropriate counselling and psychotherapy as and when needed at regular intervals. Such type of intervention could play a major role in preventing recidivism. Extra emphasis should be given to address the needs of the girls in the juvenile reformatory homes. The focus should be on developing new community based and culturally responsive alternatives for reducing too much dependence on confinement of these juveniles in the remand homes.

Development of facilities for counselling and psychological and psychiatric treatment is highly recommended in reformatory schools. Juvenile mentoring programs should be initiated in the reformatory schools where the mentors should guide the juveniles and provide technical assistance and training in their field of interest. There should be facility for web based free learning and training. Thus, we can expect that through proper care and counselling, these juveniles including those showing predisposition towards violence could be moulded to grow in the right direction and become good and responsible citizens of our nation.

**Ethical Clearance** -Taken

Time line-The total duration of the study was six months

**Budget-**Nil

**Conflict of Interest-**None

**Acknowledgement**- We're extremely thankful to the Superintendents of Reformatory schools for their support and cooperation in this research work

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# Prevalence of Addiction among Tuberculosis Patients

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## Abstract

**Background :** India accounts for about a quarter of the global TB burden. Worldwide India is the country with the highest burden of both TB and MDR TB. Smoking and alcohol use results in sub-optimal response to anti tuberculosis treatment as well as poor prognosis Alcoholism and Nicotine abuse contribute significantly to the development and treatment course of tuberculosis in patients. Aim of the Study: To assess the Prevalence of Nicotine and Alcohol Addiction among Tuberculosis Patients and to monitor the effect of Brief Counselling Sessions for the De-addiction of Alcohol and Nicotine in the management of Tuberculosis Patients. Material & Methods: We had taken the tuberculosis patients coming to the OPD of Medicine and Respiratory Medicine Departments of DrRMLIMS, Lucknow. We used questionnaires for assessing the Nicotine Dependence and Alcohol dependence among the tuberculosis patients (Fagerstrom Tolerance Questionnaire), The Alcohol use disorders Identification Test (AUDIT). Results: Prevalence of Addiction among tuberculosis patient-54 cases out of 447 total cases (April to October). In our study, we found addiction in 45 males and 9 females, Smoking addiction was seen in 13 tuberculosis patients, alcohol addiction was found in 17 tuberculosis patients, and both smoking and alcohol addiction was seen in 24 patients. Conclusion: Nicotine and Alcohol Addiction problem in Tuberculosis patients should be effectively assessed through the nicotine addiction and AUDIT scales and Brief Cognitive Therapy should be introduced along with regular ATT for effective management of such patients.

***Keywords:*** *Fagerstrom Tolerance Questionnaire, The Alcohol use disorders Identification Test(AUDIT), Brief Cognitive Therapy.*

## Introduction

Addictions for Alcohol and Nicotine are the major and significant culprits having a detrimental effect on the health and quality of life of young adults especially in a developing country like India, where the enormous number of young population constitutes as the major internal resource of the otherwise not so rich country. At the same time India accounts for about a quarter of the global TB burden. Worldwide India is the country with the highest burden of both TB and MDR TB. The various risk factors associated with development of tuberculosis include diabetes, smoking, alcohol use and other drugs abuse which result in sub-optimal response to anti tuberculosis treatment as well as poor prognosis with the development of complications leading to simultaneous co morbidities. Many factors contribute significantly to this problem of alcoholism and nicotine abuse among the tuberculosis patients. The inability of today's youth in handling the occupational and environmental stresses along with the social stressors of expectations for excellence in every examination, colleague competition, and emotional stressors caused due to insufficient time to fulfil family liabilities on every occasion creates a disturbed and evading personality. Consequently, alcohol and drugs appear as temporary stress relievers to help in escaping these challenges and simultaneously giving a false sense of well being. Unfortunately, the transition from being a user to an abuser is very gradual and subtle, thus leading to development of various addictions among them. Subsequently these addictions have a devastating effect on the already compromised health status of these patients. Therefore we need to introduce monitoring of extent of alcohol and nicotine addiction and its contributory factors leading to addiction development. This may help in prevention and early management and treatment of tuberculosis patient.

A number of studies have been done on tuberculosis

patients who have concurrent nicotine and alcohol abuse addiction 1. Babor et al., 2007; has emphasized on the alcohol screening, treatment and referral as a crucial part of primary health care in developed countries[2].

Excess alcohol use was common among patients with TB, and was associated with TB transmission, lower rates of sputum culture conversion, and greater mortality [3,4]. The primary objectives of our study were as follows-

1. To assess the Prevalence of Nicotine and Alcohol Addiction among Tuberculosis Patients

2. To monitor the effect of Brief Counselling Sessions for the De-addiction of Alcohol and Nicotine in the management of Tuberculosis Patients

The secondary objectives of our study were to cover the ethical issues in tuberculosis care5.

## Material and Method

We had taken the tuberculosis patients coming to the OPD of Medicine and Respiratory Medicine Departments of Ram Manohar Lohia Institute of Medical Sciences, Lucknow. The recently diagnosed cases of tuberculosis as well as those patients who were undergoing treatment for tuberculosis were assessed in our study. We used questionnaires for assessing the Nicotine Dependence and Alcohol dependence among the tuberculosis patients. For the above purpose we used the following survey instruments for our research-

1. Nicotine Dependence Questionnaire (Modified Fagerstrom Tolerance Questionnaire)6

2. Smokeless Tobacco Dependence Scale

3. The Alcohol use disorders Identification Test(AUDIT)Interview version and

4. The Alcohol Use Disorders Identification Test (self report version).[7]

Only those patients who were willing to participate in the research voluntarily were included in our study. The willing patients were given 30 minutes to complete and return the questionnaire. We also noted the demographic data of the patients of our study including the Age, Sex, educational status, and occupation of tuberculosis patients.

. They were divided into three groups on the basis of their addictions-

- TB with smoking only
- TB with alcohol only
- TB with smoking and alcohol addiction

Tuberculosis patients with addictions for alcohol and nicotine were further divided into two categories on the basis of type of treatment given. Patients were given one of two randomized treatments:

1. Brief counselling intervention(BCI) + TB medication regime(TAU)

2. TB medication regime alone (TAU)

Brief counselling sessions of 10-15minutes for treatment of alcohol and nicotine addictions

We included all the newly diagnosed as well as old cases of pulmonary tuberculosis in the age range of 18-80 years which were having symptoms of PTB, Positive smear, Chest radiograph showing active disease, the patients who give their written consent for participation in the study

We excluded those patients who refused to participate in the study, those patients who are HIV +ve, those patients having cardiovascular disease, diabetes mellitus or any other severe disease, those patients who are taking immune suppressants, those patients who failed to complete the questionnaire or did not return the questionnaire on time, Pregnant females.

## Observations

We came across 447 cases of tuberculosis during the six month period that is April 2019 to October 2019. Out of the detected tuberculosis patients, addiction was found positive among 54 patients.

**Table-1: Prevalence of Addiction among tuberculosis patient-54 cases out of 447 total cases (April to October)**

| S.no | Addiction | Male | Female | N(%) |
|---|---|---|---|---|
| 1 | Addiction present | 43 | 11 | 54 |
| 2 | No Addiction | 277 | 116 | 393 |
| | Total | 320 | 127 | 447 |

In our study, we found addiction in 45 males and 9 females

**Table 2: TUBERCULOSIS WITH ADDICTION**

| S.NO | AGE GROUP | MALE | FEMALE | NUMBER(n)(%) |
|---|---|---|---|---|
| 1 | 18-25 yrs | 15 | 1 | 16 |
| 2 | 26-40 years | 14 | 3 | 17 |
| 3 | 41-50 years | 9 | 2 | 11 |
| 4 | 51-65 years | 4 | 1 | 5 |
| 5 | 66 -80 years | 2 | 1 | 3 |
| 6 | >80 years | 1 | 1 | 2 |
| | Total | 45 | 9 | 54 |

Smoking addiction was seen in 13 tuberculosis patients, alcohol addiction was found in 17 tuberculosis patients, and both smoking and alcohol was seen in 24 patients

**Table -3: Type of Addiction in Tuberculosis Patients**

| S no. | Addiction | Male | Female | Number (%) |
|---|---|---|---|---|
| 1 | TB with smoking only | 8 | 5 | 13 |
| 2 | TB with alcohol only | 15 | 2 | 17 |
| 3 | TB with smoking and alcohol addiction | 22 | 2 | 24 |
| | | 45 | 9 | 54 |

**Table-4: Education status of Tuberculosis patients with Addictions**

| S no | Education status | Male | Female | Number (%) |
|---|---|---|---|---|
| 1 | Illiterate | 2 | 1 | 3 |
| 2 | Read and write only | 5 | 3 | 8 |
| 3 | Eighth grade | 14 | 3 | 17 |
| 4 | Tenth grade | 15 | 2 | 17 |
| 5 | Twelfth grade | 6 | - | 6 |
| 6 | Graduate | 3 | - | 3 |

| | | | | |
|---|---|---|---|---|
| | Total | 45 | 9 | 54 |

**Table -5: Occupation of Tuberculosis Patients with Addiction**

| S no. | Occupation | Male | Female | Number(n)% |
|---|---|---|---|---|
| 1 | Farmer | 21 | - | 21 |
| 2 | Govt job | 5 | - | 5 |
| 3 | Cook | 10 | 1 | 11 |
| 4 | Self employed | 9 | - | 9 |
| 5 | Homemaker | - | 8 | 8 |
| | Total | 45 | 9 | 54 |

## Discussion

We have studied 447 cases of tuberculosis during the 6 months period, out of which addiction was found in 54 cases (12.08%). About 12% cases reported history of addiction which is considerably less than the findings of Gegia M et al and Khan AH et al in their respective studies on smoking and treatment outcomes.[8,9].

Thomas B. in her study on association of smoking and alcohol use disorder with Tuberculosis treatment outcomes observed that 65% males were associated with smoking and AUD with Tuberculosis. In our study, there were 45 males (83.3%) and 9 females (16.6% ) who had addiction of smoking and alcohol .This number is considerably higher than the findings of similar studies, the reason may be citied as underreporting of actual addiction status by the patients in the previous studies.[10,11,12]

Maximum cases were seen in the most productive age group that is18 to 40 years age group (61.1%),The mean age was found to be 22 years (IQR:18-40).It was followed by 41-50 group with 20.3% cases. Thomas B et al found the mean age to be 38 years 1 . Geriatrics group reported only 5 cases (9.25%).The possible reason could be restricted resources in the form of money and mobility leading to increasing dependency on others with age.

The most common addiction that we encountered in our research was a combination of smoking and alcohol with accounting to 44.44% cases. Smoking also included the smokeless tobacco consuming individuals, mainly in the form of Gutkha and Kheni. Basically the majority of the population that comes to a government hospital comprises of the rural strata where physical labour is the only way to earn a living. The reason behind chewing tobacco or smoking bidis could be somewhat linked to continuous pressure and hard ways of life with most of the hours being spent working in the fields in the hot weather. Alcohol use was fairly common in the tuberculosis with 31.48% cases admitting to alcohol only addiction. Only two females confessed about drinking alcohol that too occasionally. This could easily be understood as in our society there is huge stigma attached to alcohol consumption by the females. Both the females who admitted to alcohol consumption were widows and belonged to the geriatric age group. This could be attributed to the fact that increasing age with fewer family obligations makes a person more carefree, and ignorant to society norms of rights and wrongs.

The male patients who reported Alcohol consumption, admitted to taking around 2 drinks at a time. Soh AZ. et al observed that more than 2 drinks per day with were associated with a risk of development of active tuberculosis.13 Lewis JG et al and Brown KM et al also deduced the similar association of alcohol consumption and smoking habits in development risk of Tuberculosis.14,15 Silva D. et al found that alcohol consumption were associated with an increased risk of tuberculosis when accompanied by smoking which is another risk factor for the development of active tuberculosis.[16]

Nicotine addiction alone in the form of smoking as well as smokeless tobacco chewing was observed

in 24.07% cases with 8 males and 5 females. Among the females, 4 gave a history of chewing tobacco once or twice in a day whereas one confessed of smoking husband's bidi secretly, two three times a day. All the males who gave a positive nicotine addiction history admitted to taking cigarettes, bidis as well as tobacco chewing.

Hermosilla S. et al in their study on Risk factors of Tuberculosis found that Alcohol abuse influences the incidence, clinical evolution and outcome of Tuberculosis [17]. According to Fiske CT et al and Jakubowiak WM et al in their respective studies observed that such patients were not only more infectious but were often associated with higher rates of treatment default and relapse of disease [18,19].

We also tried to analyse the indirect factors such as education status and occupation link with Tuberculosis and addiction cases. However, no conclusive evidence in the form increased susceptibility could be derived from such findings.

Addictions were commonly seen in the eight pass and tenth pass group showing 31.4% of the patients. It declined with education, such that the Intermediate pass and the graduates showed 16.66% cases. Surprisingly, the illiterates and the read and write group also projected a lower incidence of addiction along with Tuberculosis.

Talking on the occupational front of our research sample, we found that majority of male patients were farmers. This again could be linked to the fact that mainly rural population visit the government hospitals in our country. The females were mainly homemakers. One alarming fact that needs to be specifically mentioned here is that there were 20.3 % patients whose primary occupation was being a cook. On a brighter side, these individuals responded positively to brief counselling sessions and were very much motivated for completing their Tuberculosis treatment regime. Only five patients were in government jobs, pointing towards the scarcity of government jobs in our society.

## Conclusion

In our research we intended to find out the prevalence of Nicotine and Alcohol addiction among Tuberculosis patients. Though we were able to assess a sizable number of patients having addiction, we failed to assess the definitive role of Brief Cognitive Behavioural Therapy in the treatment course of Tuberculosis patients. Although we focused on the brief counselling sessions for de-addiction to nicotine and alcohol at our initial contact with the patient, we could not ascertain their effect due to poor compliance in follow ups by the patients.

However, we strongly believe and recommend intervention in the Tuberculosis management to introduce brief CBT along with ATT regime.

This would help to tackle the nicotine and alcohol use and thus help in treatment as well as prevent relapse and recurrence of the disease. The health care providers should be trained to assess and apply the nicotine addiction scale and AUDIT scale.

**Ethical issues** in the study and plans-None

Time line-The total duration of the study will be six months

**Budget-**Nil

**Conflict of Interest-** None

Acknowledgements- We are extremely thankful to the Department of Respiratory Medicine and Department of Medicine, DrRMLIMS, for their support and cooperation in this research work

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# A Cross Sectional Autopsy based Study of Homicidal Deaths in Vijayapura, Karnataka

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## Abstract

**Introduction:** Homicide is heinous crime and it is one of the oldest crimes in human civilization. Homicidal pattern vary from country to country and from one region to another, and are influenced by many factors like commonly available weapons, methods of killing, etc. In the present day world violence is clearly recognized as a global public health problem. The total number of murders recorded all over India in 2010 was 33,335 and in 2011 were 34,305. Materials and Methods: 2 year autopsy based study conducted in Vijayapura. All homicidal cases brought to the department for medico legal autopsy and also the cases which were later registered as homicide were studied. Detailed information regarding the circumstances of crime was sought from the police, victim's relatives and friends, visits to the scene of occurrence or deduced by the photographs of the scene of occurrence. The alleged weapons that were produced in the respective cases were examined and opined. Results: Among 67 cases, 43 (46.18%) were male and 24 (53.82%) were female. Most commonly affected victims were from 21 – 30 years age group. Large number of cases occurred in streets. The blunt injuries were most common 31(46.27%) to cause death.

***Keywords:*** *Homicide, blunt weapons, murder, autopsy.*

## Introduction

Homicide is heinous crime and it is one of the oldest crimes in human civilization1. Death is inevitable to everyone, once life starts, but premature ending of one's life by others has seen an alarming rise in the recent years. Homicide (homos: human being, caedere: to kill) literally means to kill a human being. Homicide is defined as killing of one human being by another human being and is one of the leading causes of unnatural deaths2. It is also defined legally as destruction of human life by an act, agencies, procurement or culpable omission of some other person or persons, is the most heinous crime.' The WHO defines homicide as any death resulting from injury purposefully inflicted by another person, is dealt under codes E960 – E9693.To commit murder, two elements ("Mens–rea" which means preplanning or afore thought and "Actus rea" which means the actual Execution) should work together to constitute the crime4. Death of a human being can occur by different methods. Many of the times they may occur in a rage, sometimes with lot of planning. There may be one man involved in a killing or many assailants may be there. Homicidal pattern vary from country to country and from one region to another, and are influenced by many factors like commonly available weapons, methods of killing, motive behind killing, family relationship problems like marital disputes, cultural, psychological, social influences, religious attitudes, criminal activities, drug culture, political factors, unemployment and socio economics status. The various patterns of homicidal deaths include assault by sharp weapon, blunt weapon, firearms, strangulation, homicidal hanging, smothering, drowning, burns, poisoning etc. In the present-day world violence is clearly recognized as a global public health problem. Violence and injuries account for 9% of global mortality and 12% of all disability adjusted life years (DALY). As per Global Burden of Armed Violence Report, 2011, the average annual global violent death rate between 2004 and 2009, was 79 per million. Globally around 5,20,000 people die each year as a result of interpersonal violence which equates to 1400 deaths every single day5. As per National Crime Record Bureau, violent crimes reported in India were 10.9% of the total Indian Penal Code crimes. The total number of murders recorded all over India in 2010 was 33,335 and

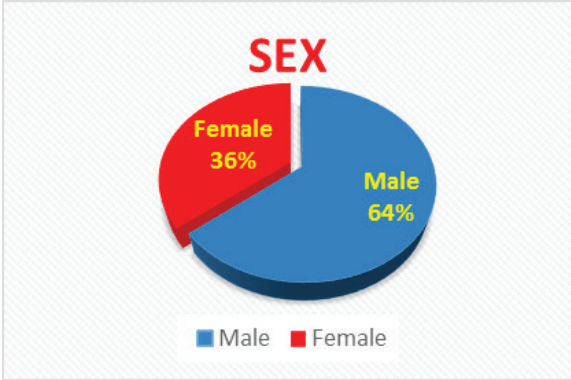
in 2011 were 34,305. Very often, the newspapers scream headlines about the rising incidence of these most horrific crimes taking place in different parts of the Vijayapura city. How safe exactly is the city, is a question that has been debated in print with increasing intensity. Where exactly does the problem lie? In the current situation, where murders have become common place, the police system has become an easy target.

## Materials and Method

The present study was conducted in the department of Forensic Medicine and Toxicology, Al- Ameen Medical College and Civil Hospital mortuaries, Vijayapura during the period from June 2013 to May 2015, a period of 2 years. All homicidal cases brought to the department for medico legal autopsy and also the cases which were later registered as homicide were studied. Ethical clearance was obtained from the institutional ethics committee prior to the conduct of the study. Detailed information regarding the circumstances of crime was sought from the police, victim's relatives and friends, visits to the scene of occurrence or deduced by the photographs of the scene of occurrence. Socio Economic status of the victim was based on Modified Kuppuswami's classification (2007 revision)6. Post Mortem examination of the victims was conducted. Viscera were sent for Chemical Analysis in suspected cases of alcohol consumption. The alleged weapons that were produced in the respective cases were examined and opined.

## Results

67 cases of homicidal deaths were sorted out for this study amongst 896 total autopsies conducted from June 2011 to May 2013. Among 67 cases, 43 (46.18%) were male and 24 (53.82%) were female. It is observed that most commonly affected victims were from 21 – 30 years age group 25(37.31%) followed by 31 – 40 age group 13(19.40%). Most of the victims are in upper lower socio- economic class i.e. 23 cases (34.33%), followed by 16 cases (23.88%) are in lower class. Large number of cases was occurred in streets 39 cases (58.21%) and 6 cases (8.96%) were found in victim's house, 41 corpses (61.19%) are present in same spot of scene of occurrence and 17 victims (25.37%) are disposed from the scene of occurrence. Most homicides took place in the evening (6pm-12midnight) and late night (12midnight-6am) i.e., about 28 cases (41.79%) and 24 cases (35.82%) respectively. The blunt injuries were most common 31(46.27%) to cause death followed by sharp injuries 25(37.31%).

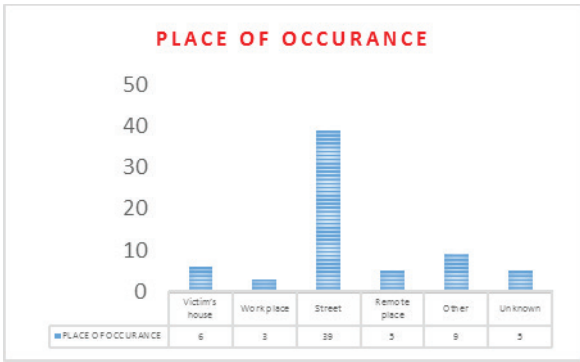



**Graph 1: Sex distribution**

**Table 1: Victims distributed according to socio-economic status:**

| Si. No | Socio-Economic Class | Number | Percen-Tage |
|---|---|---|---|
| 1 | Upper (I) | 0 | 0% |
| 2 | Upper middle (II) | 14 | 20.89% |
| 3 | Lower middle (III) | 13 | 19.40% |
| 4 | Upper lower (IV) | 23 | 34.33% |
| 5 | Lower (V) | 16 | 23.88% |
| 6 | Not known | 1 | 1.49% |
| | total | 67 | 100% |

Graph 2: Homicides distributed according to place of occurrence of crime:




**Graph 3: Homicides distributed according to place of disposal of dead body:**

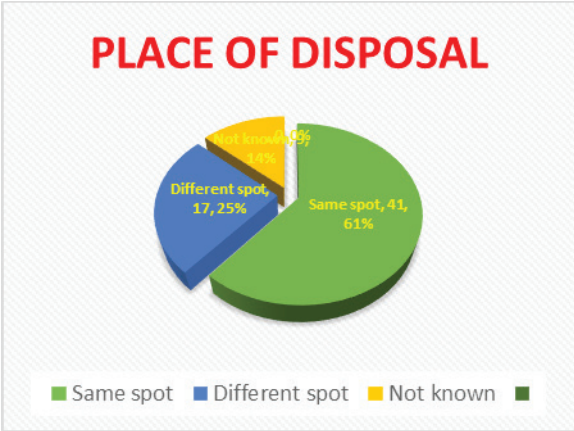
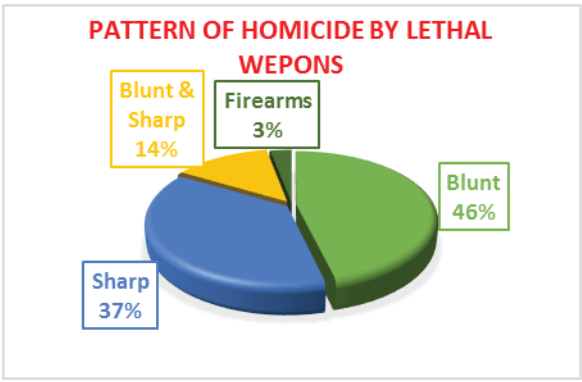



**Table 2: Homicides distributed according to time of occurrence of crime:**

| Sl.no | Time of Occurrence | Number | Percentage |
|---|---|---|---|
| 1 | Morning (6Am-12Noon) | 06 | 8.96% |
| 2 | Afternoon(12Noon-6Pm) | 06 | 8.96% |
| 3 | Evening (6Pm-12Midnight) | 28 | 41.79% |
| 4 | Late Night(12Midnight-6Am) | 24 | 35.82% |
| 5 | Not known | 03 | 4.48% |
| | Total | 67 | 100.00% |




**Graph 4: Homicides distributed according to pattern of homicide by lethal weapons:**

## Discussion

During the study period, from June 2013 to May 2015, 896 medico-legal autopsies were conducted, of which homicidal deaths constituted 67 cases (7.48%). The factors contributing for highest incidents in the 21-30 years age groups were allegedly due to marital disputes, unsuccessful romantic disputes, and infidelity, and related to dowry in females and gang rivalry, unemployment, arguments, drug addiction, property disputes, extramarital affairs were the reasons in males. The next vulnerable age group being 31-40 years of age constituted 19.40%. In studies by Gupta A et al.1, and Mohanty M.K et al.3 most of the victims belonged to the age group 21-30 years which is consistent with our study. The present study is in contrast to the findings observed by Wahlsten P et al.7

Male victims contributed to more than 2/3rd (64.18%) of the cases which can be attributed to the aggressive nature of males than females. Similar observation made by Gupta A et al.1, Mohanty M.K et al.3. The present study observation is in contrast to Kominato Y et al.8 where male to female ratio of the victims was 1:1

In our study the maximum numbers of victim (34.23%) were from the upper lower socioeconomic status followed by lower socio economic status (23.88%), this could be because ours is a developing country and much of the people fall in this group, also the changing social trends of nuclear families, unemployment, illiteracy, financial problems etc. Similar observations are made by Karn A et al.9 lower economic class people committed more crime. The present study contrasts with those by Hugar B S et al.10 where majority was from middle class people.

Our study observed that maximum number of victims (58.21%) were done to death at streets and lonely places, which implies that these homicides were mostly pre meditated as the assailants were aware of the victim's whereabouts and motive being financial dispute or murder for gain, followed by 9 cases (13.43%) which were in other places which were due to gang rivalry, revenge murders and arguments arising while under the influence of alcohol followed by victims house in which mostly the victims were staying alone and homicide committed by known assailants.

Other places in the study consisted of Railway Station, playground and auditoriums etc. This study is similar to the study conducted by Syed Amjad Agha et al.11, Vijayakumari N et al.12, where majority of homicides took place in the streets and is in contrast with the study of Hugar B S et al.10, where majority took place in victim's residence & according to Dhaval J et

al.13, it took place in dense forest areas.

In present study, in 17 cases (25.37%) the dead body was moved from the scene of the crime and attempts were made by the assailants to obliterate the identity and as well as the evidence of crime in the form of covering with the slab, or disposing the corpse in lonely places or on roads for masquerading as an accident with ultimate purpose of concealing homicide. The presence or absence of viz. blood stains, signs of struggle/disturbance at the spot of recovery of body were taken into account for the above inference, by visiting the scene, observing the spot photographs and information furnished by the police. This observation is supported by Hugar B S et al.10 where in 15.75% of the cases moved from the spot, Wahlsten P et al.7, where in 8% of the cases the body was moved from the scene of the crime, Mohanty M.K et al.3, the body was disposed in different spot in 14.7% of cases.

Maximum number of the homicides took place in the evening 28 cases (6pm-12midnight) and late night 24 cases (12midnight-6am) which can be attributed to the factors like night fall or in darkness the chances of assailant being recognized is reduced, after a day's hard work the chances of victims and assailant engaging in arguments, be it domestic or financial are high when they meet up after work and as revealed in the study, most of the victims belonged to low socio-economic status. Further alcohol has been a major contributory factor. Similar observations were made in studies conducted by Hugar B S et al.10, and Mohanty M.K et al.3, in all these studies maximum homicides occurred in the evening and night. Our study in contrast to studies conducted by Vougiouklakis T et al.14, where in maximum (26.9%) of cases occurred during noon. The incidence of homicide was more during day time 74.55% in a study conducted by Vijayakumari N et al.[12].

Death due to blunt weapon injuries were 31 cases (46.27%) which outnumbered those due to sharp weapon injuries of 25 cases (37.31%). This is attributed to the easy availability of various blunt weapons in this area. In one case the assailant used sharp weapon to cause fatal injury and also strangulated his wife with a ligature. In another case the assailant used multiple methods (blunt, sharp and firearm) to cause fatal injury. Majority of the blunt and sharp weapon injuries were pre-meditated and mainly involved gang rivalry whereas few blunt weapon injuries were unpremeditated and assailants used the blunt weapon available at the scene of occurrence. Only 2 cases of fire arm injury was observed as the law in India is strict regarding gun licensing. Similar study was made by Vijayakumari N et al.12, where blunt weapon injury was the most common cause of death and Mohanty M K et al.3, blunt weapon injuries accounted for 36.5%. Our study is in contrast to the studies by Hugar B S et al.10, Gupta A et al.1, sharp weapons were the most commonly used. Humayum H et al.15 noticed firearms were the most common means used for homicide. This could be attributed to the lethality of weapon and determination on the part of assailant to kill the victim, since most of these cases were premeditated.

## Conclusion

- The study group included 67 homicidal cases.
- Maximum number of homicides occurred in the age group 21-30 years in both sexes constituting 37.31%.
- Males are the commonest victims, twice more likely than that of females. Most of the victims (56.25%) were married.
- Most of the victims were in the lower socio-economical class.
- Maximum homicide took place on the streets.
- The corpse was moved from the scene of crime in 25.37% of the cases.
- Most of the homicides took place in the evening and late night.
- Blunt weapon injuries were the commonest pattern followed by sharp weapon.

**Conflict of Interest** – Nil

**Source of Funding –** Self

**Ethical Clearance** – Obtained from institutional ethics committee prior to conduct of the study.

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# A Descriptive Study on Alleged Sexual Offenders in South Bangalore

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## Abstract

Rape is a serious offence and understanding the offender may help us to understand the antecedents leading (directly or indirectly) to the act. The examination of the survivors of alleged sexual offences is one of the most difficult tasks in Medical practice. Methodology: This study was carried out between January 2012 to June 2013 in the Department of Forensic Medicine at Tertiary care centre, South Bangalore, Karnataka. The cases registered under sections 375, 376 IPC and Protection of Children from Sexual Offences Act were included in the study. Results: Total 38 accused were examined during study period. 55.3% of cases were in the age group of 21 years to 30 years. 57.9% of cases were graduated, and 34.2% were employed. 44.7% cases belong to lower middle class (III). In 47.5 % of cases the incident occurred between evening & mid night time. Offender was close friends of the victim in 47.5% cases. Non genital external injuries were present in 5.3% of cases. Discussion: Young adult males were involved in majority of cases due to their immature mind set. Majority of the offenders were close friends of the victim, and were booked due to stringent provisions of POCSO Act. Consensual sexual activity between teenagers can be decriminalized.

***Key words:*** *Sexual offence, perpetrator, 375 IPC, POCSO Act, rape.*

## Introduction

Sexual violence is ubiquitous; it occurs in every culture, in all levels of society and in every country of the world. Data from country and local studies indicate that, in some parts of the world at least, one woman in every four has suffered an attempted or completed rape by an intimate partner during her lifetime.(1) Sexual violence takes place within a variety of settings, including the home, the workplace, schools and the community. There are various ways and forms in which sexual exploitation is practiced. The most perverted and degrading form is rape. Incidence of rape, particularly among young and adolescent girls is reported almost daily.

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According to the data collected by NCRB, rape cases have increased from 24206 cases in 2011 to 38947 cases in 2016(2), however as against this conviction rate of sexual offenders remains low i.e. around 28 % in 2014(3) to 36 % in 2016(4). This is inspite of the amendments made in Indian Penal Code (IPC), Criminal Procedure Code (CrPC), Indian Evidence Act (IEA) and enactment of POCSO Act, 2012 which provides legal protection to children below 18 years.

There are many studies on profile of victims of sexual offence whereas studies on profile of accused are less. Considering the danger of allowing true offenders to go unpunished as well as injustice of wrong convictions, the task of the examining physician becomes even more important. So, present study was aimed to find out the profile of sexual offences in South Bangalore and to describe the characteristics of accused of sexual assaults.

## Materials and Method

This was a prospective descriptive study, carried out for a period from January 2012 to June 2013 in

the Department of Forensic Medicine at Tertiary care centre, South Bangalore, Karnataka State, India. Study was started after approval from Institutional Ethical Committee. The cases registered under sections 375, 376 IPC (inclusive of amendments) and Protection of Children from Sexual Offences Act (POCSO Act) were included in the study. Similarly, alleged sexual offence cases which later turned out to be false allegations were not included in study. Sexual offenders involved in offences against males were also not included. Informed written consent has been taken from the accused. A standardized proforma was filled in each case after detailed interviews with the investigating officials and alleged accused. The information regarding the age, socio-economic background, level of education, occupation, marital status, history of sexual offence as stated by the accused. During examination, general details of the accused' health, mental state, physical examination, injuries, examination of the genitalia, and laboratory findings, were recorded in proforma. The comparison was made between these findings and conclusions were drawn after comparing and discussing with similar type of the work carried out by other authors.

## Results

Total 38 accused were examined during study period. Maximum numbers of accused i.e. 21 cases (55.3%) were in the age group of 21 years to 30 years. (Table 1) Maximum number of accused i.e. 22 (57.9%) cases were graduated. Maximum number of accused i.e. 13 cases (34.2%) were employed. 17 (44.7%) cases belong to Lower middle class (III).(Table 2) In majority of cases i.e. 18 (47.5 %) cases the incident occurred between evening & mid night time, i.e. from 6.00PM to 12.00AM.(Table 3) Among 38 cases, 18 (47.5% ) cases, the offence was committed by close friends of the victim followed by 10 (26.3 %) case, the accused were neighbours of victims.(Table 4) 15 (39.5 %) cases occurred in the accused house, followed by 9 (23.7%) cases occurred in the other indoor places like lodge, friend's house.(Table 5) In the present study non genital external injuries were present in 2 cases (5.3%).(Table6)

**Table 1: Age wise Distribution of accused of sexual offence cases**

| Age (years) | Accused (number) | Percentage |
|---|---|---|
| 0-10 | 00 | 00.00 |
| 11-20 | 08 | 21.05 |
| 21-30 | 21 | 55.26 |
| 31-40 | 08 | 21.05 |
| 40+ | 01 | 2.63 |
| TOTAL | 38 | 100 |

**Table 2: Distribution of accused according to socio economic class**

| Socio Economic Class | Number | Percentage |
|---|---|---|
| Upper class(I) | 02 | 5.3 |
| Upper middle class(II) | 07 | 18.4 |
| Lower middle class(III) | 17 | 44.7 |
| Lower class(IV) | 12 | 31.6 |
| Total | 38 | 100 |

**Table 3: Distribution of cases according to time of incident**

| Time of incidence | Number | Percentage |
|---|---|---|
| 12.00am to 6.00am | 10 | 26.3 |
| 6.oo am to 12.00pm | 04 | 10.5 |
| 12.00 pm to 6.00pm | 06 | 15.7 |
| 6.00pm to 12.00am | 18 | 47.5 |
| Total | 38 | 100 |

**Table 4: Distribution of sexual offence cases based on the relation between victim & accused**

| Relation between accused and victim | Number | Percentage |
|---|---|---|
| Close friend | 18 | 47.5 |
| Relative | 04 | 10.5 |
| Neighbour | 10 | 26.3 |
| Stranger | 02 | 05.2 |
| College mate | 04 | 10.5 |
| Total | 38 | 100 |

**Table 5: Distribution of Cases According to Place of Incident**

| Place of incidence | Number | Percentage |
|---|---|---|
| Victims' house | 08 | 21.0 |
| Accused house | 15 | 39.5 |
| Other indoor (lodge, friend's house) | 09 | 23.7 |
| Outdoor | 06 | 15.8 |
| Total | 38 | 100 |

**Table 6: Physical Findings in the Accused of sexual offence**

| Findings | Number | Percentage |
|---|---|---|
| Non-genital external injuries | 02 | 5.3% |
| Local genital injuries | NIL | - |
| Matted pubic hairs | NIL | - |
| Loose hairs at genitalia | NIL | - |
| Presence of smegma | 01 | 2.6% |
| Penis circumcised | 05 | 13.2% |
| Urethral discharge/ signs of sexually transmitted diseases | NIL | - |

## Discussion

Thirty eight cases of sexual assault were examined. Age of accused ranged from 17 to 57 years. Majority of the accused (55.26%) were in the age group of 21-30 years. This finding is consistent with the findings of studies done by Bhowmik[5] and Veeresh[6]. Offenders were of younger age group due to their immature mind set which make them prone to indulge in unlawful sexual activity.

Considering the education of accused, 22 cases (57.9%) were graduates, 12 (32%) cases were studied up to school and 4 cases (10.5%) were illiterates. The findings in the present study differ from the study done by Veeresh[6] in which 77.28% of accused were illiterates. In our study maximum number of accused i.e. 13(34.2 %) were employed, followed by 12(31.6%) were labourer by occupation. The findings in this study differ from the study done by Veeresh[6] in which 54.55% of accused were labourers. Considering the socio economic status of the accused, the present study shows that majority of accused i.e.17 (44.7%) cases belong to Class III, followed by 12(31.6%) cases belong to Class IV. Least number of accused i.e.2 (5.3%) cases belongs to Class I. The findings of this study slightly differs from the other study done by Veeresh et al[6] in which majority of the accused were from poor socio economic status.

Our study showed that majority of cases i.e. 18 (47.5 %) occurred between evening & night time, i.e. from 6.00PM to 6.00 AM. These figures are similar to those encountered in studies in India [7] and non-Indian community [8]. The reason attributed towards the highest incidents occurring at night are that during this period either the event takes place unnoticed or the victim cannot get help from others[7] or due to social habits of the majority of victims and the fact that cover of darkness can give opportunities for assaults to take place[8].

In the present study, majority of the sexual assault i.e. 15 (39.5 %) cases occurred in the accused house. It is followed by 9 (23.7%) cases occurred in the other indoor places like lodge, friend's house. The findings of our study are consistent with the study done by Sean D McDermott et al[8] in which 43% of cases occurred in the indoors but he has not categorized as victims'/ accused house. It differs from study by Roychowdhury et al[9] who observed in 77.5% of cases the incidence occurred outside, and, it also differs from the study done in Bangladesh[10] in which 36.95% of incidents occurred in victims' house. The occurrence of events mostly inside the house is attributed to the accused being able to trap the victim easily inside a closed room[7].

Relationship of accused with the victim has been studied by various authors. Present study shows that accused was close friend of the victim in 47 % of the cases; while he was completely stranger in 5 % of the cases. While findings of Indian studies were similar with close friend of the victim being offender in 37 %(3) of cases to 55 %[5] of cases. The reason proposed was that a closer acquaintance knows about the weakness of a victim and takes advantage of her loneliness by development of trust.[7] However, rape cases in Indian context were found to be consensual in 62 % of cases(11) Majority of such cases are of consensual elopement and sexual activity of victim and accused; however they were covered under stringent provisions of POCSO Act.[11][12]

Consensual sexual activity is also one of the reasons for lack of genital injuries in all cases and non-genital injuries in only 5.3 % cases in present study. In 5 cases (13.2%), penis was circumcised. Presence of smegma was noted in only 1 case (2.6%). Genital examination of the accused did not reveal any evidence of sexual assault. The findings of our study are consistent with the study done by Veeresh.[6]

National Crime Record Bureau plans to compile 'Sex Offenders Database at National Level' with primary goal to provide tracking and monitoring of the offenders.[2] More studies with background of present study will provide a holistic view of sexual offenders. However, this study had several limitations which included absence of data regarding offenders of sexual assault where victims were male. Psychiatric evaluation of the offenders was not evaluated as plea was not raised regarding it. Less sample size may have less statistical impact of the results, but might reflect the burden of the evil in the society and provide comparative data and impetus for further studies involving larger population strata.

## Conclusions

It is a known fact that recorded rape cases are only the tip of the iceberg as not only many cases of rape are not reported, but also many of those cases in our country are not registered. The forensic examination of the victim as well as accused may play a vital role in helping the law to give justice to the victims. The present study shows that young adult males were involved in majority of cases.

This denotes the immature mind set of young adults who are more prone to commit an offence. We encounter two types of offence one being the genuine rape cases and another type is in which the girls had gone voluntarily with their boyfriends. In such cases, the minor age of girls makes the accused as culprit and punishable for their offence. To prevent such kind of cases there should be a proper education for both teenage girls and boys. Further, consensual sexual activity between teenagers can be decriminalized to avoid criminal stigma.

**Conflicts of Interest:** Nil

**Source of Funding:** Nil

**Ethical Clearance:** Obtained from the Institutional Ethics Committee.

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# Pattern and Nature of Fatal Blunt Force Homicidal Injuries and Its Correlation with the Weapon

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## Abstract

Blunt force trauma or blunt injury is a Physical / Mechanical injury which is non- penetrating or penetrating in nature characteristic of a weapon / instrument / object which is not sharp. The word denotes the nature of object producing the injury rather than the type of injury. Injuries produced by blunt trauma include abrasions, contusions, , lacerations or bone fractures. The pattern and nature of the injury is influenced by the force transmitted, weight of object / weapon and nature of the surface of blunt object. The study evaluates the fatal blunt injuries over a period of six years (2006-2011) and correlates the pattern, nature and configuration of injury with the alleged weapon / object used to inflicting it.

***Key words –****Blunt force injuries -Homicide*

## Introduction

The hemodynamics of force transmitted during forceful blunt contact is the transfer of kinetic energy or potential energy of moving object or body resulting in mechanical injury[1]. The kinetic energy ($1/2\ mv^2$) is directly proportional to the mass of the object and velocity of contact. The nature of the tissue, its composition or plasticity has also an influence on the nature of injury. The nature of the surface of the object also has an influence on the external injury.The nature of blunt injury inflicted by a plastic instrument or an instrument which breaks on impact may also be different from that produced by a rigid instrument. When a moving object comes to rest by contact with human body, the entire kinetic energy of the moving object is transmitted on to the body resulting in injury, however in a glancing blow or impact only the kinetic energy corresponding to the decrease in velocity is discharged to the tissues[2]. Factors which prolong the time of transmission of the energy will also reduce the destructive effect of the impact / blow. The skin being elastic and fat content of subcutaneous tissue being pliable, blunt injuries inflicted over these areas has a compressive effect resulting in rupture of smaller blood vessels. The crushing effect resulting in a contusion or undue stretching may result in a stretch rupture of deeper soft tissues like muscle. Even though a definite quantification of blunt force applied cannot be measured evaluation of type and nature of injuries sustained to deeper soft tissues and bones help in an approximate evaluation of blunt force transmitted[3] .

## Aims and Objectives

1. Evaluation of pattern and nature of blunt force injuries and correlation of injuries with weapon used for infliction.

2. Evaluation of probable nature of weapon by examination of blunt injury during medicolegal autopsy.

## Materials and Method

Retrospective evaluation of death by blunt force injuries by perusal of notes prepared during medicolegal autopsy in the Department of Forensic medicine Govt. medical college Kozhikode.

The pattern and nature of fatal blunt force injuries is evaluated and correlated with the nature of weapon shown by the investigating officer during the course of investigation .The study is conducted over a period 2006-2011 . Approval of research project obtained from Institutional Ethics committee of Govt. Medical college Kozhikode.

**Inclusion criteria**

All medicolegal autopsy cases of murder by blunt force in which the weapon of offence has been identified beyond reasonable doubt during the crime investigation and submitted before the doctor who had conducted the postmortem examination .

**Exclusion criteria**

Decomposed dead bodies has been exempted from the study

## Observation

Evaluated 11 deaths conducted in the year 2011. Abrasions were seen in 4 cases and all of them were associated with underlying contusion. Out of the 11 cases, 9 deaths were due to blunt head injury. Contusions were seen in 6 of the deaths due to head injury with abraded contusions in 4 cases. 5 cases of head injury was having laceration of scalp and all of them were having underlying contusion. One case of injury inflicted by a laterite stone had abrasion, contusion and laceration of scalp. 8 cases of fatal head injury had fracture of skull out of which one was suture diastasis. Cerebral contusions were seen underneath the fracture in 8 cases with overlying subarachnoid haemorrhage subdural bleed in 5 of them . Death due to blunt trauma to chest in both cases was by stamping. Defence wound was seen in cases of homicide using wooden stick or iron rod / pipe except in one of the case.

Evaluation of 9 fatal injuries were conducted in the year 2010. 8 cases had died of blunt injuries sustained to the head. Abraded contusions were seen in four of the head injuries. In four cases, there were scalp contusion with overlying split laceration in three of them. Five cases having laceration of scalp was associated with underlying fracture. All the cases of fatal head injuries were associated with underlying fracture. Subdural and subarachnoid bleed was associated with brain contusion in six of the cases. Depressed fracture was seen in two cases where iron rod was used as weapon and in two cases and where stone was used as weapon. Defence wounds were seen only when the weapon was a linear blunt object (sticks/rods). One death was due to blunt injury to chest and abdomen resulting in fracture of rib and liver injury.

In the year 2009 ten deaths were evaluated out of which 8 were due to head injury. Abrasions were seen in four of the cases and was associated with contusion of scalp. Four cases were associated with contusion of scalp. Contusion was associated with laceration in one case with laceration of scalp in five of them. Comminuted fracture with depression was seen when stone was used as the weapon. Other cases had fissured fracture and sutural diastasis. Subarachnoid haemorrhage was seen in all cases with contusion of brain. Subdural haemorrhage was seen in four cases with contusion and subarachnoid haemorrhage. Extradural haemorrhage was associated with fracture of skull. Eventhough SAH and SDH was associated with contusion of the brain EDH was not associated with brain contusion. Comminuted fracture of skull was seen when the object used for inflicting blunt force was stone. Blunt force injury due to stamping had resulted in injuries to chest and abrasion. Defence wounds were only seen when the weapon was linear blunt weapon(sticks / rods ).

In the year 2008, 11 cases of homicide by blunt force were evaluated. 10 deaths were due to head inury. 8 cases had contusion of scalp and 6 out of it had overlying abrasions. 9 cases of head injury was associated with laceration of scalp.Fractures were seen in all head injuries . Comminuted fracture and multiple fissured fractures of skull were seen when the blunt weapon was broad, heavy and hard like stone, linear fissured fracture was seen when weapon was linear blunt weapon which had also resulted in depressed fracture in one cases. 7 cases were associated with cerebral contusions and subarachnoid haemorrhage and subdural haemorrhage. Cerebral laceration was seen underneath the depressed fracture .Death had resulted from bowel rupture and peritonitis following blunt injury sustained to the abdomen. Defence wounds were seen in 7 cases of blunt injury using linear blunt weapon (stick/rod).

In the year 2007, 10 cases of homicide due to blunt force was evaluated. 5 deaths were due to head injury. Four cases were having abraded contusion of scalp. 3 cases were associated with laceration of scalp. All the death due to traumatic brain injury was associated with fracture of skull, the fracture being comminuted when stone was the weapon used. 4 cases of death due to traumatic brain injury was having brain contusion and subarachnoid haemorrhage. Laceration was seen

underneath the comminuted skull fracture in one death. Defence wounds were seen in all deaths where the weapon was linear and blunt (stick/rod ). Two deaths were due to the combined effects of multiple injuries sustained, inflicted by a group of people using sticks and rods. Blunt injury to neck using linear blunt weapon resulted in delayed death due to quadriparesis.One death was due to chest injury involving lung due to stomping .

In the year 2006, 11 deaths due to blunt force injuries were evaluated out of which 7 deaths were due to head injury. Four of the deaths were associated with contusion of scalp with abrasion in 3 of them. Laceration of scalp was seen in 5 of fatal traumatic brain injury. All the seven deaths were associated with fracture of skull out of which two had depressed fractures. Both the depressed fractures were associated with cerebral lacerations. Cerebral contusions with subarachnoid haemorrhage was seen in 3 cases with fissured fracture. Scalp lacerations were seen in both the cases where the blunt injury was inflicted with stone. All the head injury using linear blunt weapon was associated with fissured skull fracture. Defence wounds were seen in all cases of assault with stick / rod. Two deaths due to stomping had resulted in blunt injury to abdominal viscera and kicking had resulted in blunt trauma to viscera of chest and pneumothorax.

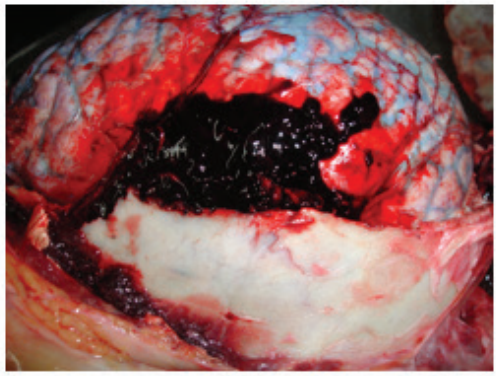

**photo 1 Extra dural haemorrhage**

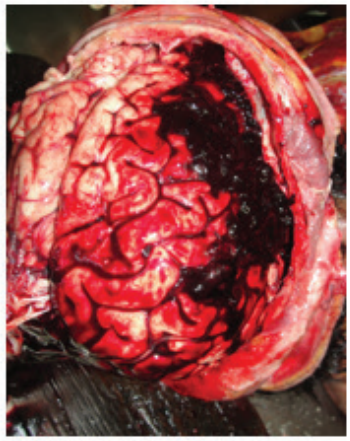

**photo 2 Subdural haemorrhage**

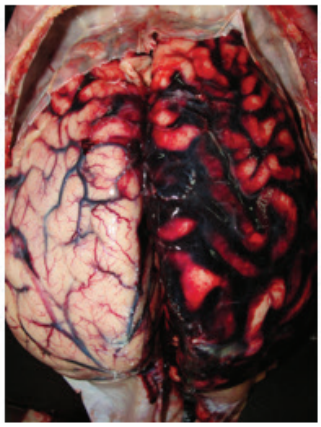

**photo 3 Subarachnoid haemorrhage**

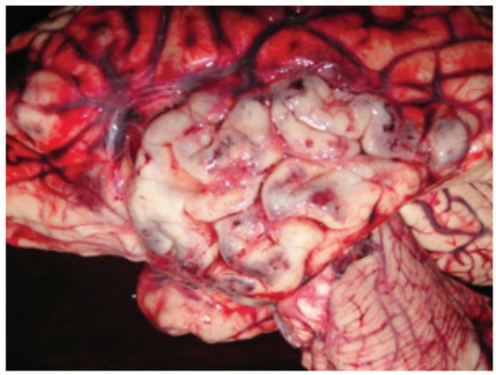

**photo 4 cerebral contusion**

**Table : 1 – Homicide by blunt force injury**

| Year | No.of cases | Head injuries | Chest injuries | Abdominal injuries | Multiple injuries | Neck injury |
|---|---|---|---|---|---|---|
| 2011 | 11 | 9 | 2 | - | - | - |
| 2010 | 9 | 8 | 1 | 1 | - | - |
| 2009 | 10 | 8 | 1 | 1 | - | - |
| 2008 | 11 | 10 | - | 1 | - | - |
| 2007 | 10 | 5 | 1 | - | 2 | 2 |
| 2006 | 11 | 7 | 1 | 2 | 1 | - |

**Table : 2 – Evaluation of Head Injury**

| Year | No.of cases | Abraded contusion | Contusion | Laceration | Fractures | EDH, SAH, SDH | Brain laceration / contusion | Weapon used |
|---|---|---|---|---|---|---|---|---|
| 2011 | 9 | 4 | 6 | 5 | 8 | 5 | 8 | Wood stick 3<br>Iron rod – 2<br>Stone – 2<br>Hit wall 2 |
| 2010 | 8 | 4 | 4 | 5 | 8 | 6 | 8 | Wood stick 1<br>Iron rod – 3<br>Stone – 2<br>Hit on wall - 2 |
| 2009 | 8 | 4 | 4 | 5 | 5 | 7 | contusion5<br>Laceration-1 | Wood stick – 4<br>Iron rod – 2<br>Stone – 2 |
| 2008 | 10 | 6 | 8 | 9 | 10 | 7 | contusion7<br>Laceration- 1 | Wood stick – 3<br>Iron rod – 3<br>Stone – 4 |
| 2007 | 5 | 4 | 1 | 3 | 5 | 4 | Contusion-4<br>Laceration-1 | Wood stick – 2<br>Iron rod – 2<br>Stone – 1 |
| 2006 | 7 | 3 | 4 | 5 | 7 | 6 | Contusion-3<br>Laceration-2 | Wood stick – 3<br>Iron rod – 2<br>Stone – 2 |

**Table : 3 Other blunt injuries**

| Year | Chest Injury | Abdominal injury | Multiple injuries | Neck injury | Manner |
|---|---|---|---|---|---|
| 2011 | 2 | - | - | - | Stamping |
| 2010 | - | 1 | - | - | Stamping |
| 2009 | 1 | 1 | - | - | Stamping |
| 2008 | - | 1 | - | - | Stamping |
| 2007 | 1 | - | 2 | 1 | Stamping<br>3 iron rods /stick |
| 2006 | 1 | 1+1=2 | 1 | - | Stamping<br>3 iron rods /stick |

## Discussion

Most of the deaths in homicides due to blunt violence was due to traumatic brain injury (47 cases of TBI out of 62 homicides)[4], the head being the most vulnerable part in blunt force trauma. Traumatic blunt injuries was inflicted using wooden stick in majority of deaths (20/62 cases), followed by iron rods / pipes (18/62 cases) and stone (13/62 cases) and blunt impact on wall in 3/62 cases. In two cases, the assailants were multiple using wooden sticks and iron pipes / rods. Majority of the deaths due to traumatic brain injury by blunt force had scalp lacerations with underlying contusions (32/62) contusions associated with abrasions were seen in 25 out of 62 cases and contusions without abrasions or lacerations were seen in 27 out of 62 cases. Blunt traumatic injuries to head with underlying fractures was seen in 46 cases out of the 47 deaths due to traumatic brain injury. Even though the blunt force delivered during assault cannot be precisely quantified, the force exerted in all cases of homicide was sufficient to fracture the skull[5]. Coup contusions were seen in majority of cases (33/47) underneath the skull fracture and the contusion was associated with Extra dural / subdural bleed / Subarachnoid haemaoohage in 35 cases. Out of the 62 homicides by blunt force one deaths was due to injuries to the neck. Stamping of neck resulted in rupture of trachea and soft tissue contusion of neck . Blunt injury inflicted to the neck with linear blunt weapon resulted in cervical spinal cord injury. A small proportion of homicides by blunt force were injuries involving chest and abdomen (5/62 each) involving the lungs, liver and bowel and all of them were blunt force inflicted by stamping and not by weapons. They appear to have been inflicted in the lying down position of the victim. Three deaths were due to combined effects of multiple injuries inflicted including soft tissue injuries and bony fractures. They were inflicted by many assailants with blunt weapons like sticks and rods. There was no evidence of a single fatal injury but death had occurred due to the effects of multiple injuries. Following blunt trauma to the head, majority of (27/47) subjects developed coup contusion underneath the site of blunt impact associated with surrounding haemorrhage (haemorrhagic contusion extending into subarachnoid space or subdural space), possibly a compression contusion and haemorrhage from damaged blood vessels of brain parenchyma. Contra coup contusions was seen in two persons possibly a acceleration contusion due to movement of head at the time or immediately after sustaining the blunt force[6]. Contusion without haemorrhage was seen underneath the fracture in 7/47 cases, possibly due to inbending of the skull at the site of blunt injury due to the elastic nature[7]. Depressed fracture was associated with underlying dural tear and cerebral laceration. Intra cranial haemorrhage without contusion of brain parenchyma was seen in

7/47 cases which appears to be due to the sudden jerky movement of the unsupported head within the cranial cavity resulting in vascular stretch, shearing or rupture of the bridging veins.

## Conclusion

Most of death due to blunt trauma / blunt force injuries in homicide is due to head injury. The excess force applied that is always more than required to cause death has almost always resulted in skull fracture and brain contusions[8]. The patients had not survived in the hospital following sustaining the injury which on evaluation retrospectively conveys the intention to kill, however the knowledge that he will die would not have been amenable for evaluation by the assailant forcing him to use excess force. Most deaths due to blunt injuries were unlikely to happen as a result of grave provocation as the weapon commonly used, a linear blunt weapon like wooden stick or iron rod suggest premeditation.A prospective study is also being attempted to observe the changes in the pattern and nature of injuries and the manner of homicide by blunt force which is a curse to the society in the name of politics, religion,and vengeance .

**Ethical Clearance:** Taken from institutional ethics committee Govt. medical college calicut

**Conflict of Interest :** Nil

**Source of Funding :** Self

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# Prevalence of Odontogenic Cysts and Tumors – A Clinicopathological Study

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## Abstract

**Background:** The incidence and frequency of odontogenic cysts and tumors depends on the different geographic location. Odontogenic cysts and tumors are lesions that arise from the tooth apparatus or its remnants. The purpose of this study was to determine the prevalence of odontogenic cysts and tumors over a period of 5 years 9 months and to compare our results with other published studies.

**Aim and Objective:** The purpose of this study was to evaluate the prevalence of odontogenic cysts and tumors diagnosed at the Department of Oral Pathology, M.M. College of Dental Sciences & Research, Mullana (Ambala) and to compare the results with findings in the literature.

**Materials and Method:** Data of odontogenic cysts and tumors diagnosed during 2014 to 2019 (till September) w4ere collected from the files of the Oral Pathology Department, M.M. College of Dental Sciences & Research, Mullana (Ambala).

**Results:** Out of the total 71 cases of odontogenic cysts, most prevalent odontogenic cysts were found to be radicular cysts (n=42, %= 59.1%), followed by dentigerous cysts (n=17, %=23.9%) and odontogenic keratocyst (n=12, %=16.9%). Among the odontogenic tumors out of 49 cases reported, the most prevalent was ameloblastoma (n=28, %=57.1%) followed by, ameloblastic fibroma (n=06, %=12.2%), odontoma (n=05,%=10.2%), adenomatoid odontogenic tumor (n=03, %=6.1%), peripheral odontogenic fibroma (n=02, %=4.08%), ameloblastic carcinoma (n=02, %=4.08%), odontogenic fibroma (n=02, %=4.08%) and odontogenic myxofibroma (n=01, %=2.04%). The anterior and posterior portion of the body of mandible was the most common site for both odontogenic cysts and tumors. The age group for odontogenic cysts ranged from 07 to 72 years of age, whereas for the odontogenic cysts the range was 10 to 75 years of age. The male to female ratio for the odontogenic cysts was 1:1.2, whereas for the odontogenic tumors it was found to be having more female predilection with the ratio of 1:1.3.

**Conclusion:** The prevalence of odontogenic cysts was similar to that reported in the literature, with incidence of radicular cysts seen most frequently. In case of odontogenic tumors the findings vary to the reported literature with ameloblastoma being more commonly reported.

***Key words:*** *Ameloblastoma, dentigerous cysts, odontogenic cyst, odontogenic tumors, odontoma, radicular cysts*

## Introduction

Odontogenic cysts and tumors are derived from epithelial, ectomesenchymal or both the elements of the tooth-forming apparatus.[1,2] The jaws are host to a wide variety of cysts and tumors because large part of the tissue is involved in tooth formation.[3]These generally show slow, expansive growth and in some cases associated with marked bone destruction and recurrence.[4] Studies using histopathological data are important to characterize and establish the prevalence of oral and maxillofacial lesions in different age groups. In this respect, research based biopsy records are necessary to analyse the main types of lesions that occur in a given population and to provide data that can guide pathologists particularly in the

diagnosis and management of these lesions. Therefore, the purpose of this study was to evaluate the prevalence of different types of odontogenic cysts and tumors diagnosed histopathologically over a period of 5 years and 09 months in Mullana (Ambala) at the institutional level according to age, gender and site affected and to compare the results with findings in the literature.

## Materials and Method

Data of odontogenic cysts and tumors diagnosed during 2014 to 2019 (till September) were collected from the files of the Oral Pathology Department, M.M. College of Dental Sciences & Research, Mullana (Ambala). The data were collected according to the variables; age, gender and site.

## Results

Out of the total 71 cases of odontogenic cysts, most prevalent odontogenic cysts were found to be radicular cysts (n=42, %= 59.1%), followed by dentigerous cysts (n=17, %=23.9%) and odontogenic keratocyst (n=12, %=16.9%). Among the odontogenic tumors out of 49 cases reported, the most prevalent was ameloblastoma (n=28, %=57.1%) followed by, ameloblastic fibroma (n=06, %=12.2%), odontoma (n=05,%=10.2%), adenomatoid odontogenic tumor (n=03, %=6.1%), peripheral odontogenic fibroma (n=02, %=4.08%), ameloblastic carcinoma (n=02, %=4.08%), odontogenic fibroma (n=02, %=4.08%) and odontogenic myxofibroma (n=01, %=2.04%). The anterior and posterior portion of the body of mandible was the most common site for both odontogenic cysts and tumors. The age group for odontogenic cysts ranged from 07 to 72 years of age, whereas for the odontogenic cysts the range was 10 to 75 years of age. The male to female ratio (M:F) for the odontogenic cysts was 1:1.2, whereas for the odontogenic tumors it was found to be 1:1.3.

## Discussion

Odontogenic cyst and tumors account for less than 2-3 % of all oral and maxillofacial lesions.[1] More than 95% of all odontogenic tumors are reported in large series are benign and around 75% are represented by odontomas, ameloblastomas and myxomas.[5] In the present study, Out of the total 71 cases of odontogenic cysts, most prevalent odontogenic cysts were found to be radicular cysts (n=42, %= 59.1%), followed by dentigerous cysts (n=17, %=23.9%) and odontogenic keratocyst (n=12, %=16.9%) which is in accordance to other studies in various countries.[4,6-9] This high incidence of radicular cysts may be due to the precarious oral conditions of the population studied and the lack of public awareness to prevent oral infectious diseases.[4] Among the odontogenic tumors out of 49 cases reported, the most prevalent was ameloblastoma (n=28, %=57.1%) followed by ameloblastic fibroma (n=06, %=12.2%), odontoma (n=05,%=10.2%), adenomatoid odontogenic tumor (n=03, %=6.1%), peripheral odontogenic fibroma (n=02, %=4.08%), ameloblastic carcinoma (n=02, %=4.08%), odontogenic fibroma (n=02, %=4.08%) and odontogenic myxofibroma (n=01, %=2.04%). Similarly, studies from Nigeria, China, Tanzania, and SriLanka show a higher prevalence of ameloblastoma.[10-14] Ameloblastoma accounts for 60.3% of all odontogenic tumors in Indian population, with a mean age of presentation of 30.2 years.[15] As studies on the incidence of ameloblastomas are rare but at the molecular level, it was observed that the transforming growth factor-β (TGF-β)/SMAD signaling pathway is commonly activated in ameloblastomas, adenomatoid odontogenic tumor, and calcifying cystic odontogenic tumors. Meanwhile, the TGF-β/SMAD immuno reaction is significantly reduced in ameloblastomas in comparison to AOT's and calcifying cystic odontogenic tumors. These changes may lead to the more aggressive biological behavior of ameloblastomas through increased cell proliferation and reduced apoptosis and differentiation.[16] In the present study, the anterior and posterior portion of the body of mandible was the most common site for both odontogenic cysts and tumors similar to the studies reported by Nunez-Urrutia et al,[7] Avelar et al[6] and Meningaud et al[17] whereas many previous studies have reported maxilla[18-20] was the anatomic site most often affected by odontogenic cysts but there is no definitive explanation in the literature related to site variations.[21]

The age group for odontogenic cysts ranged from 07 to 72 years of age, whereas for the odontogenic tumors the range was 10 to 75 years of age. The male to female ratio for the odontogenic cysts was 1:1.2 with a female predilection. Similar results have been reported in Brazilian population.[22] On the contr4ary, male predominance was found in other studies[22-26]whereas for the odontogenic tumors it was found to be having

more female predilection with the ratio of 1:1.3.

## Conclusion

The prevalence of odontogenic cysts was similar to that reported in the literature, with incidence of radicular cysts seen most frequently. In case of odontogenic tumors the findings vary to the reported literature with ameloblastoma being more commonly reported.

**Ethical Clearance:** Since it was a retrospective study, there was no need for the ethical clearance from the committee.

**Source of Funding:** Self

**Conflict of Interest:** Nil

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# A Study of Over-The-Counter (OTC) Drug Usage Pattern among the Patients attending a Medical College Hospital

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## Abstract

**Background:**Over the counter drug abuse is a growing problem and it needs more recognition. This current study is aimed to assess the pattern of over the counter drug usage among the patients attending Saveetha medical college hospital, Chennai, Tamil Nadu.

**Method:** This cross-sectional questionnaire based study was conducted at Saveetha medical college and hospital, Chennai, Tamil Nadu. The patients who signed the informed consent form were the study participants, a total of 100 patients were involved. The study period lasted from 23rd January 2019 to 30th March 2019. After the data was obtained they wereanalyzed using Microsoft excel. Percentages and frequency were calculated.

**Result:** A total of 100 filled questionnaires were collected from the study participants. Majority of the participants (63%) bought OTC drugs on occasion and the rest (37%) bought them always. Most of them (43%) consumed OTC drugs when the symptoms were minor/manageable, 33% of them whenever they felt sick and 24% when they couldn't go to a doctor. Many (41%) believed they could relieve fever by using OTC drugs, 20% to relieve nausea and 39% to relieve headache. Antipyretics (47%) were the most commonly consumed OTC drug. Most (38%) common reason for choosing OTC drug was to save time.

**Conclusion:** This study helped gauge the general public's views on OTC drug usage and gives an idea about the amount of work that is yet to be done or has to be done to bring OTC drug abuse under control. It is almost obligatory to make the patients understand the detrimental effects of OTC misuse and abuse- and the most effective way to achieve this is by making the people aware of them in the first place. Even though OTC drug abuse is a largely recognized problem, we still have a long way to go in terms of actually solving it.

***Keywords:****Over the counter drug, OTC drug misuse and abuse, self-medication.*

## Introduction

A drug is a substance intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease.

OTC drugs are:

- Drugs that do not require a doctor's prescription
- Bought off-the-shelf in stores
- Regulated by FDA through OTC drug monographs[1].

OTC drug monographs are a kind of "recipe book" covering acceptable ingredients, doses, formulations and labeling. Monographs will continually be updated adding additional ingredients and labeling as needed. Products conforming to a monograph may be marketed

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without further FDA clearance, while those that do not, must undergo separate review and approval through the "New Drug Approval System"[1].2

Simply put, Over the Counter (OTC) drugs are medicines available without a prescription at pharmacies and are a part of self-medication process.

OTC medications have become a mainstay of Indian healthcare as more and more people are self-medicating.

A survey conducted in 2015, participated by 20,000 people from 10 Indian cities through an online doctor consulting platform, found that 52% of the participants practiced self-medication - citing lack of time to visit a doctor, wanting to save on consultation fee, reliance on internet for solutions as themajor reasons[2].

Patients rely more on their friendly neighbourhood chemists to give them their appropriate medication for ailments such as cough, cold, allergies, headache, fever and even skin-related conditions[2].

OTC drugs can provide immediate relief and are safe to an extent but people should realize that even an aspirin has adverse effects or can cause harm. People should realize that OTC medications are intended to treat short term illnesses and symptoms. Many OTC drugs are formulations of several medications which could interact with each other and cause harm. According to the FDA the most vulnerable people i.e. people most at risk are young children, adults over 55 and patients using drugs that affect kidneys.

Globally there is a demarcation – a separate category for drugs that can be sold without a prescription, but India doesn't have one[4,5]. If regulated properly – armed by more patient education, OTC medications can be an useful tool to deal with the problems of rising out-of-pocket healthcare costs, inadequate doctor-patient ratio and, weak and overburdened public healthcare system.

OTC medication abuse is a recognized problem and more research is needed to quantify the problem. This questionnaire based study is aimed to access the pattern of OTC drug usage and make people aware of the risks of self-medication. People shouldconsciously take steps to- go to the doctor, avoid unnecessary self-medications, adhere to the recommended dosage and read the labeling. Reporting any and all of the adverse effects experienced due to the consumption of an OTC drug ensures that proper pharmacovigilant actions can be taken. Following which the harmful effects of OTC drug usage can be minimized. Bottom line is that we should educate the patient before they self-medicate, so that they can make the right choices.

## Materials and Method

This cross-sectional, questionnaire based study was conducted to assess the pattern of OTC drug usage among the patients attending Saveetha Medical College hospital Chennai. The duration of the study was from 23rd January 2019 to 30th March 2019.

The study was conducted after obtaining permission and approval from the IRB.The participants in the study were the patients who attendedSaveetha Medical college, Thandalam.Objectives and procedure of the study were explained to the participants and those who signed the informed consent form were enrolled in the study. Those who hesitated to participate were excluded from the study.

The questionnaire containing various questions regarding OTC drug usage, like place of purchase of OTC drug, frequency of buying OTC drugs, common reason for consuming OTC drug etc was administered to each participant. The filled questionnaires were then retrieved from 100 participants.

Statistical tool: All the data obtained were analyzed through Microsoft excel. Percentages were calculated and chi-square test was done.

## Result

**Gender:**

Both women and men who took part in the survey were equally likely to use OTC medications.

**Place of purchase of OTC drugs:**

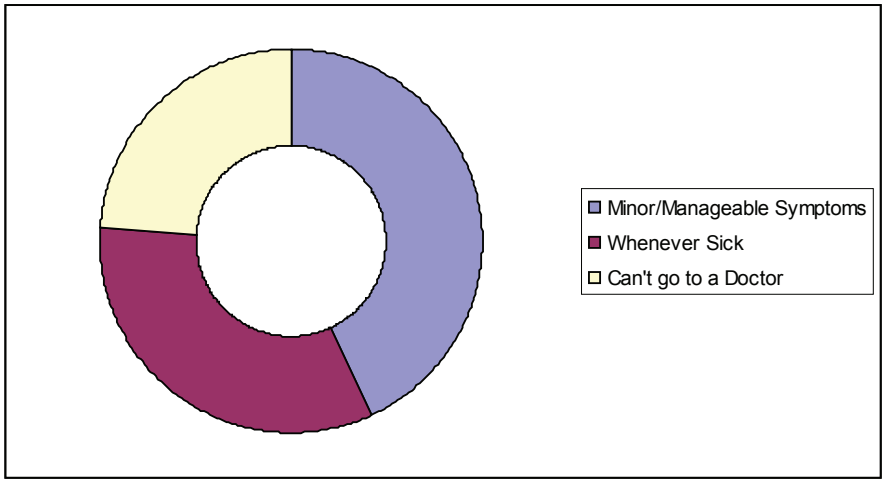
It was observed that 49% of the participants purchased OTC drugs from outside pharmacies, while 33% got them from hospital pharmacies and 18% got them from friends or relatives.

**Frequency of buying OTC medications:**

63% of the participants bought OTC drugs on

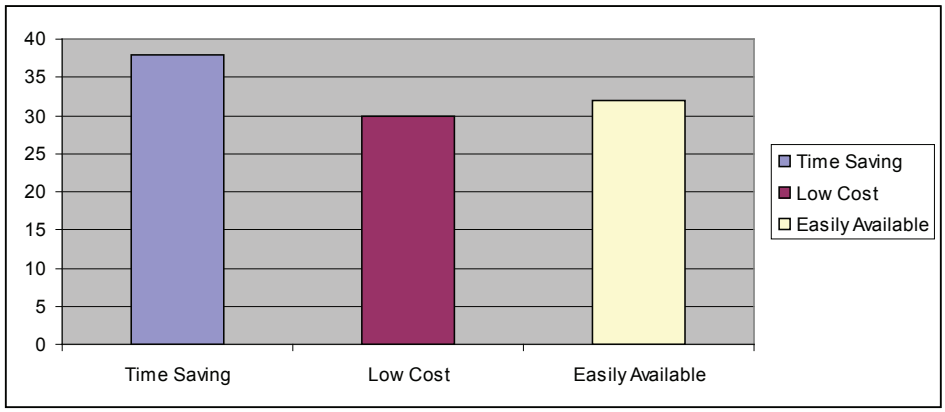
occasion while 37% of the participants opted to buy OTC drugs always.

**Figure 1: Time of consumption of OTC drugs**



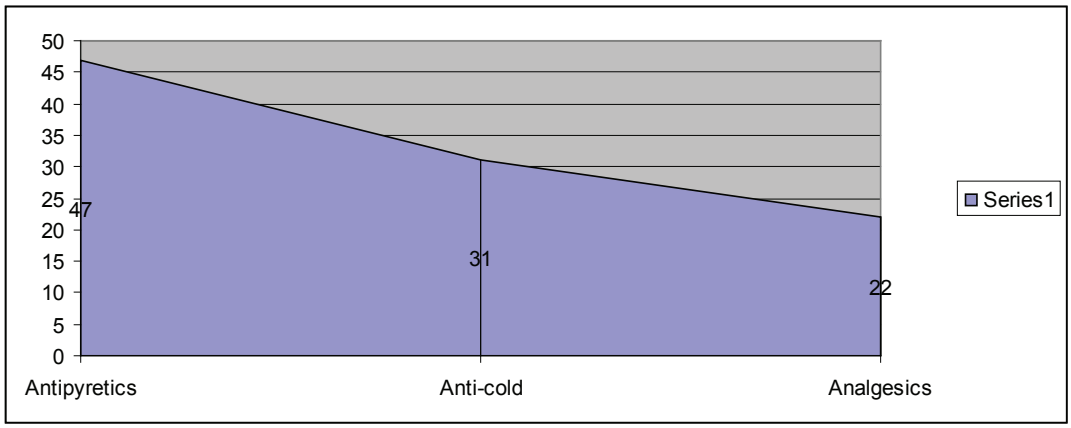

43% of the participants consumed OTC drugs when the symptoms were minor or manageable, 33% whenever they felt sick and 24% when they couldn't go to a doctor (Figure 1)

**Figure 2: Most common reason for purchase of OTC drugs**



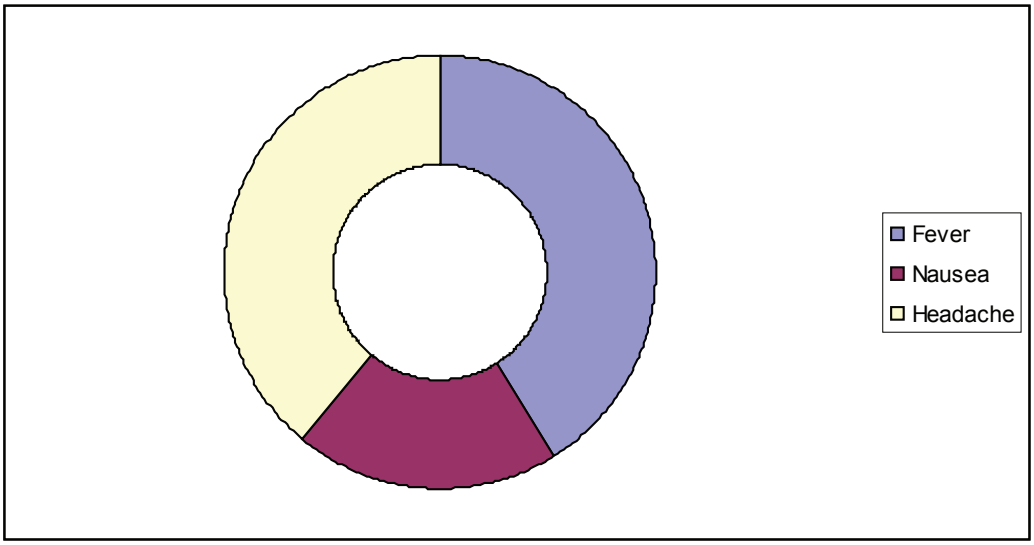

38% of the participants cited time saving as the reason for using OTC drugs, 30% of the participants used OTC drugs as they were a cheaper option and 32% used OTC drugs as they were easily available (Figure 2)

**Figure 3: Most common OTC drug consumed**




**47% of the participants bought antipyretics the most, 31% bought anti-cold and 22% bought analgesics (Figure 3)**

**Figure 4: Most common ailment they consume OTC drug for**




41% of the participants took OTC drugs because of fever, 20% to relieve nausea and 39% to relieve headache (Figure 4)

**TABLE 1: Taking the recommended dose**

| Options | Percentage |
|---|---|
| Took more than the recommended dose | 23% |
| Took only the recommended dose | 77% |

On asking whether they took more than the recommended dosage of the OTC drug, 23% of the participants agreed to over medicating and 77% of the participants said they only took the recommended dosage even if they weren't relieved of their symptoms or problem.

**TABLE 2: Adverse effect because of the OTC drug**

| Options | Percentage |
|---|---|
| Has experienced adverse effect | 28% |
| Has not experienced any adverse effect | 72% |

28% of the participants had experienced an adverse effect from taking the OTC drug while 72% of the participants had not experienced any adverse effect.

## Discussion

The frequency of usage of OTC medications in developing countries is believed to show an increase[6,7].There are various studies that suggest that sociodemographic factor plays an important role in OTC drug consumption. Socioeconomic factor also affects theconsumption of OTC drug in a particular demographic area[8]. In our country there are no specific regulations or rules laid down yet that can help bring down OTC medication misuse and abuse[2].Abusing OTC drugs can lead to a variety of health problem ranging from gastric ulcers to kidney failure and death[3]. It could worsen the condition of the patient by causing other debilitating diseases or making the disease itself to progress. There

have been many studies before with similar intentions and tones as this one; to raise awareness about the ill-effects of OTC drug abuse.

Inthe study done by Parikh.D, Sattigeri.B.M, Kumar.A, Brahmbhatt.S, 87% of the participants shared OTC drugs among their friends and relatives[10]. In this study however only 18% percentage of the participantsreceived OTC drugs from friends or relatives.

Easy availability of OTC drugs, chance to avoid the doctor's consultation fee, and save time were among the most common reasons for choosing to buy OTC drugs instead of directly consulting a doctor. As observed by this study, the most common reason for purchase of OTC drugs was to save time (38%) but in the study done byMourya, A., Mary, C., James, C., Jose, J., & Srinivasan the most common reason was easy accessibility.

In this study, it was found that majority of the participants took OTC drugs as a remedy for fever (41%). While in the study done by Parikh.D, Sattigeri.B.M, Kumar.A, Brahmbhatt.S the frequently reported illnesses that prompted self-medication were headache, cough and cold[10].

In another study[13], the most common drug used for self-medicating was paracetamol, this is in line with the current study, according to which antipyretics (47%) were most commonly consumed by the participants.

Another study, from the Journal of Public done by Niamh AFingleton, Margaret C Watson, Eilidh M Duncan, came to the conclusion that analgesics were the drugs commonly misused or abused (dependence was reported) and the most common illnesses were cough and cold[14]. This is in contrast with the current study, which gathered that the most common OTC used were antipyretics and the most common illness was fever.

It was found that 28% of the participants in the current study had experienced adverse reactions from taking OTC drugs, while in a different study 18.62% of the participants had experienced side effects from consuming OTC drugs[16].

The variation in the results obtained by all the past studies and this one is probably due to the difference in sociodemographic details of the study.

## Conclusion

OTC medication misuse and abuse is a growing problem, especially in developing countries like ours and it has been overlooked. Raising awareness about the adverse effects of self-medication is the best way to counter this problem. It should be an obligatory part of the duties of a health care professional.

Educating the public or the patients on how to self-medicate is an important step that can be taken to reduce the chances of them misusing or abusing OTC medications. A patient or person solely dependent on themselves or blindly trusting their local pharmacists for the right remedy might end up with a bigger disease or problem than with what they started. They focus on just treating the symptom and might even let the underlying disease progress into a severe or fatal form.

Interventions at different levels (accessibility, affordability) that will change the public's perception of OTC medication usage and vigilance during drug dispensation may help reduce the OTC medication abuse.

**Conflict of Interest :** Nil

**Source of Funding :** Self

**Ethical Clearance :** Obtained

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# Tobacco Toxicity in Tobacco Chewers

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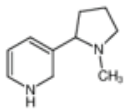
## Abstract

Nicotine is highly addictive plant derived alkaloid and the most important species in human use today is Nicotiana tabacum. There are direct health effects of chronic nicotine exposure. Even in low doses, nicotine causes vasoconstriction and other cardiovascular effects related to catecholamine release and promote angiogenesis, neuroteratogenicity, and possibly some cancers[1]. Periodontal disease and dental cavities and have up to 48 times the risk of oropharyngeal cancers compared with people who do not use tobacco products[2]. Low doses exposure produces fine tremor, cutaneous vasoconstriction, increased GI motility, and increase in heart rate, respiratory rate and blood pressure[3]. Low dose nicotine also increases mental alertness and produces euphoria and desired psychoactive effects[3]. Metabolism is via the hepatic cytochrome oxidase system. The half life of nicotine in the body is 1 to 4 hours and decreases with repeated nicotine exposure[4].

***Key words:*** *Vasoconstriction, periodontal disease, leucoplakia, psychoactive effects, myocardial ischemia, macular degeneration, impotence, atrial fibrillation, cancers.*

## Introduction

**Nicotine, $C_{10}H_{14}N_2$ [5] MW = 162 daltons**



**It is a colorless, volatile, bitter, hygroscopic liquid alkaloid that turns brown and resinous on exposure to air.**

Action of Nicotine: It acts on the autonomic ganglia which are stimulated initially, but are depressed and blocked at later stage. It also acts on the somatic neuromuscular junction, and afferent fibers from sensory receptors[6].

## Materials and Method

On Examination of **126** Persons in MAEER'S MIMSR Medical College & YCR Hospital who **is chewing tobacco since 5 years.**

1) These persons are mostly attenders, sweepers, technicians, and clerks, extra.

2) All are males.

3) They used to mix lime and tobacco or only tobacco and rub on the palm of one hand and place it between lower lip inner aspect of mouth and right or left lower jaw gums. They place it for 10 to 30 minutes, and allow it absorb through the mucous membrane.

4) Immediately they will get euphoria, pleasuring mind, and false sense of wellbeing.

5) They take it when they are at leisure.

6) After and during chewing tobacco they prefer rest.

7) Above 85% are well nourished and in active sex, rest are not in active sex and not take much food.

8) All are living in Endemic area of Tobacco chewing. All are hailed from village areas of Marathwada region of Latur District-rural where natives chewing tobacco products habitually.

**On examination Findings:**

**Pulse:** Normal for all; for those who chew tobacco for 10 15 years vessel wall is thick, sclerotic changes like fibrosis of vessel wall is found.

**B.P.:** Mild increase immediately after chewing. Lower for those chew tobacco for over 15 years.

**Liver** and spleen are normal.

**Respiratory** rate is 18 to 22/minute.

Mentally alert, listen to commands.

Always restrains extra activities, extra work.

Increase in rest taking behavior.

## Findings

1) Compulsion to chew tobacco for further time.
2) Addiction forming for mental well being.
3) Abstinence due to knowing of its harmful effects. But he again takes it for mental pleasure.
4) He takes it thinking that he is doing adult type of thing for self prestige as he moves in lower job works and others to speak of his health.
5) For hunger it is used as alternative to the food.
6) It works as appetite suppressant.
7) In persons of 5 to 10 years of chewing history show

a) Reduced visual acuity. b) Reduced field of vision.

[Macular fovea reflex is absent, indicating macular involvement of macular region of retina – observed in village rural people coming to Ophthalmology OPD]

8) Pupillay reaction is not brisk.
9) Tobacco amblyopia – in persons of history above 10 years. Reduction of- vision of retinal or macular/ CNS origin.
10) Pulse is – Normal or Reduced in rate.
11) Memory loss: To the extent of learning remembering of educational type.
12) Develops selfishness behaviors, of his very near personal benefit/ pleasure type.
13) Develops narrow mindedness. Have selfish mind. Immediate benefits type though he knows that this may be damaging.
14) He sticks to the local of his known rules/norms/ customary things. (taking tea, tiffin during examination times).
15) Monetary/Economic Affairs: i) economically selfish, to the temporary immediate comports. ii) No long term savings or investments on lands or plots, etc for longer periods of decades. iii) Selfish to his own sexual affairs and acts. iv) 90% of all these taken alcohol once in a week to have sexual pleasure.
16) For sexual purpose he is gradually increasing the dose of Alcohol. Previous 30ml to have sex. Now to take 90ml to have sex. It shows there gradual decrease of Libido-male Impotence
17) Mouth: 1. Oral mucous membrane is light violet colour like cyanosed mucous membrane. Normally it is pinkish to red in colour.

**2. Alternate cyanosed, pale whitish areas are found.**

**3. Micro ulcers (about 0.1mm) in the oral cavity are found in 96 persons – 76%;**

**4. Macro-ulcers -20.63%. (26)**

**5. Pre-leukoplakia pale areas (mid way between normal and leukoplakia found in -8.7% (11)**

**6. Leukoplakia appeared and reversed on stoppage of tobacco chewing and taking adequate food -2.38% (3)**

**7. Brownish staining of teeth is seen in -97.61% (123); Brownish staining of Oral mucous membrane in 95.23% (120)**

**8. Brownish staining of gums is seen in -97.61% (123)**

**SUGGESTIONS:** Tobacco Control Legislation[7] to be implemented.

## Conclusions

1) These people are at the risk of forthcoming development of a) Endarteritis obliterans. b) Alzheimer's like disease with memory loss. c) Visual field defects. c) Leucoplakia (precancerous condition). d) Cardiac disorders like angina pectoris, myocardial ischemia, and cardiac irregularities, atrial fibrillation. E) Early appearance of Peptic ulcer and are more likely to fail antacid and $H_2$-blocker therapy for peptic ulcer disease[8]. F) Increased risk of osteoporosis, senile cataracts, and macular degeneration; and results in wrinkling of the skin, gallstones and male impotence[9]. G) High blood pressure.

2) Abstinence is the primary method of therapy.

3) These people are of lower socio-economic group.

4) The natives of their villages are in the habit of tobacco chewing. So they are ignoring the risks of tobacco chewing.

5) They unable to afford the Tobacco replacing/ abstinence therapy.

6) They are not approaching the Doctor because it

hampers their duty, loss of money.

7) Unable to afford the Tobacco replacement therapy.

8) They are at the risk of developing **CANCERS**: Cancers of lips, oral cavity, pharynx, esophagus, pancreas, larynx, lung, kidney, urinary bladder, other urinary organs[10].

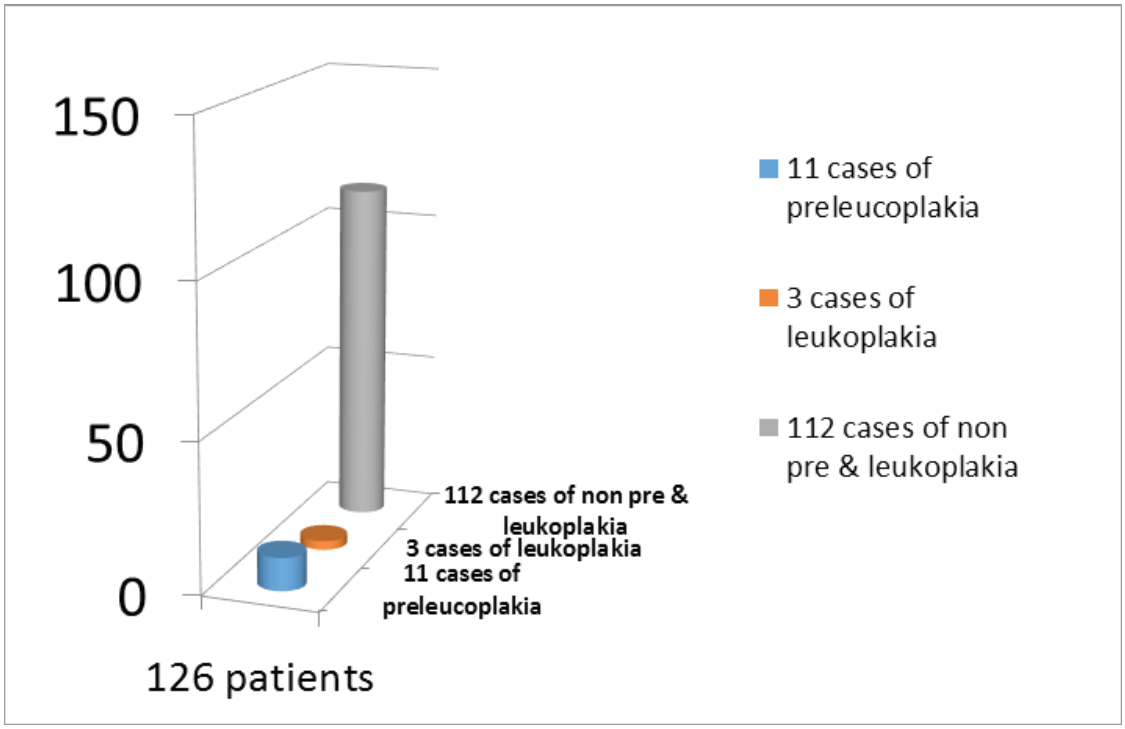



**Fig.1. Incidence of Leukoplakia and pre-leukoplakia.**

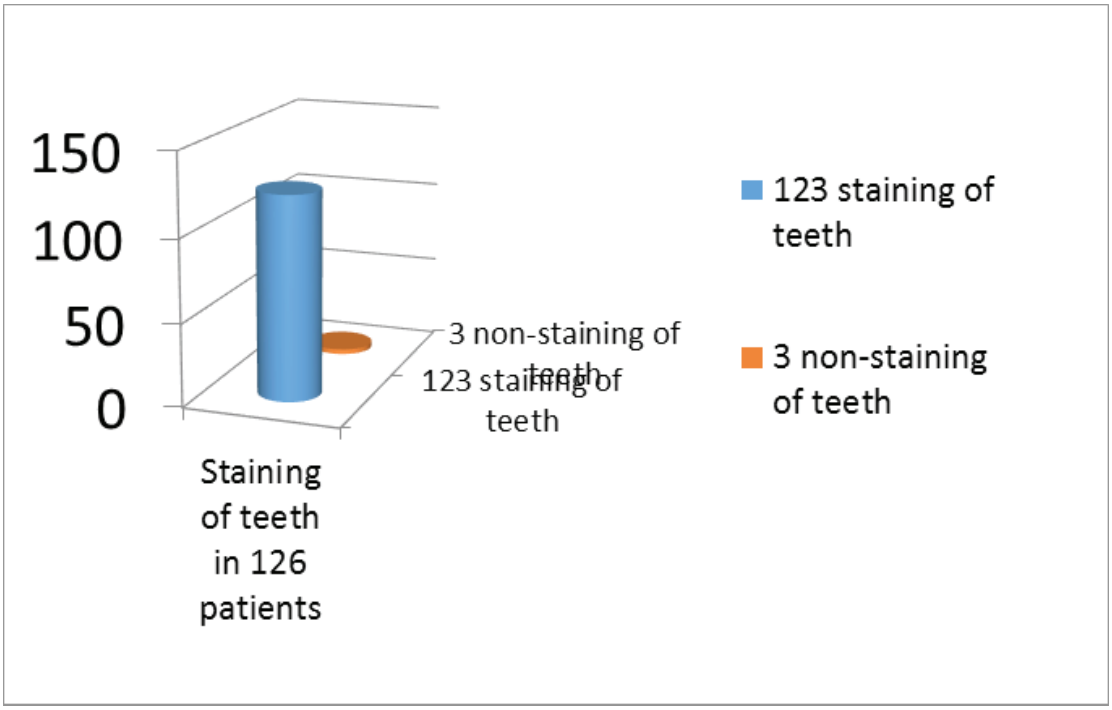



**Fig. 2. Incidence of Teeth staining.**

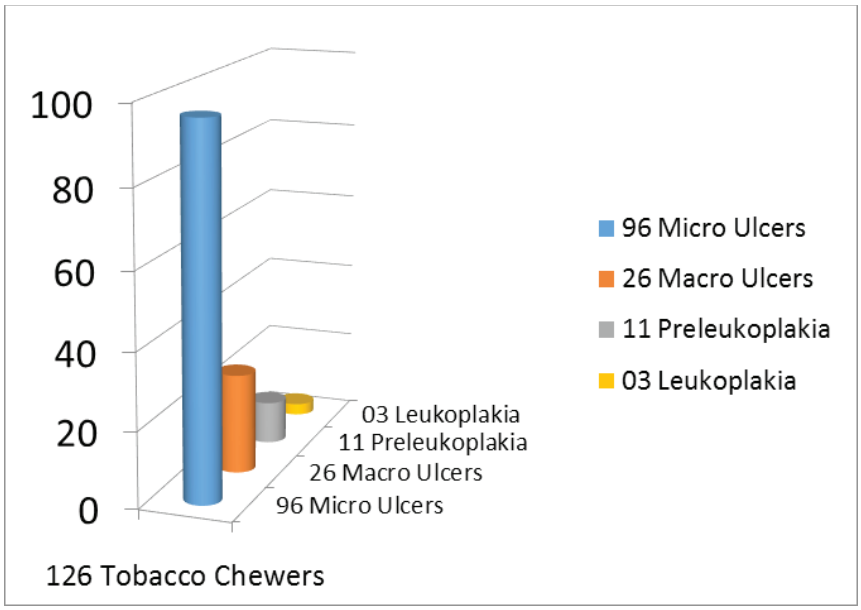



**Fig. 3. Incidence of ulcers, pre-leukoplakia and leukoplakia.**

**Acknowledgement:** I thank to all persons who cooperated and volunteered.

**Declaration:** I, Dr. Prof. V. Chandrasekhar, declare that the work done is solely belongs to me alone. This is not published in any National /International Journal.

**Ethical Clearance:** Taken from ETHICS COMMITTEE of Maharashtra Institute of Medical Sciences and Research, Latur, India

**Conflict of Interest:** Nil.

**Source of Funding:** Self.

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# Study of Temporary Trends in The Pattern of Poisonings in a Tertiary Care Hospital

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## Abstract

**Introduction***:*Acute Poisoning forms one of the commonest causes of emergency hospital admissions. Poisoning both accidental and intentional are a significant contributor to mortality and morbidity throughout the world.A complete review of the risk factors decreases incidence and significant morbidity and mortality rates.The present study aims to characterize contemporary trends in the pattern of poisonings in a tertiary care hospital in Chennai,Tamil Nadu.

**Materials and Method:** The study was conducted in tertiary care hospital [Saveetha Medical College and Hospital] for a period of one year[from January 2018 to December 2018].The data was obtained retrospectively from medical case sheets and various parameters such as sex ratio,occupation,poison type,etc., were analyzed and compared with other studies .

**Results:** The study population consists of 294 cases, among which 232 were suicidal and 62 were accidental. Female predominancy was reported in the present study, with the prevalence of poisonings more common among the age group 21-30y years.Household poisons like insecticides and rodenticides were the most commonly administered.Most of the patients admitted were skilled workers and homemakers .

**Conclusion:** Poisoning was more common in young adults,particularly females.Insecticides and rodenticides were major causes of poisoning,with the higher incidence among skilled workers.Highly equipped treatment facilities and establishment of poisoning centers have become the need of the hour.

***Keywords:*** *Insecticides,poisoning, household poisons,poison information center.*

## Introduction

Poison is a substance (solid,liquid or gas), which if introduced in a living body or brought into contact with any part thereof would produce disease or even death by its constitutional or local effects or both [(1)]. Death due to poisoning has been known since time immemorial [(2)]. In the present world, there has been reports of increased morbidity and mortality due to poisoning. It has posed a major health distress to all parts of the world in various degrees. Toxicology is the science dealing with properties, actions, toxicity, fatal dose , deduction and estimation of, interpretation of the results of toxicological analysis and treatment of poisons [(1)]. Among the unnatural deaths, death due to poisoning comes next to road traffic accidents[(3)].

Pattern of poisoning in a region depends on various factors which include availability and access to the poison, socioeconomic status of an individual, cultural and regional influences etc. Poisons include chemicals, biological agents and radioactive substances which may be in the solid , liquid or gaseous state. Rapid industrialization, introduction of newer range of drugs for treatment and massive use of pesticide in agriculture

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has increased the incidence of poisoning [3]. Agricultural poisoning, death due to snake bite, household poisoning and poisoning due to pharmaceutical products have shown a rise in the recent times[2].

Both cases of intentional and unintentional poisonings are seen. Intentional poisonings include homicidal and suicidal poisonings. According to the legal system of our country, all poisoning death cases are recorded as unnatural death and a medico-legal autopsy is routine [2]. Knowledge of general pattern of poisoning in a particular region will help in early diagnosis and treatment of cases,thus decreasing the rate of morbidity and mortality.Hence this study was carried out with the objective to find out the contemporary trends in the pattern of poisonings in a tertiary care hospital.

## Materials and Method

A retrospective study on pattern of poisonings was conducted in Saveetha Medical College and Hospital, Thandalam, Chennai. The study included various poisoning cases reported in the Emergency Department of the hospital during the year 2018 (January 2018 -- December 2018). Data collection was done as per the hospital rules and regulations. Permission from both Forensic Medicine Department and Medical Records Department was obtained prior to data collection.

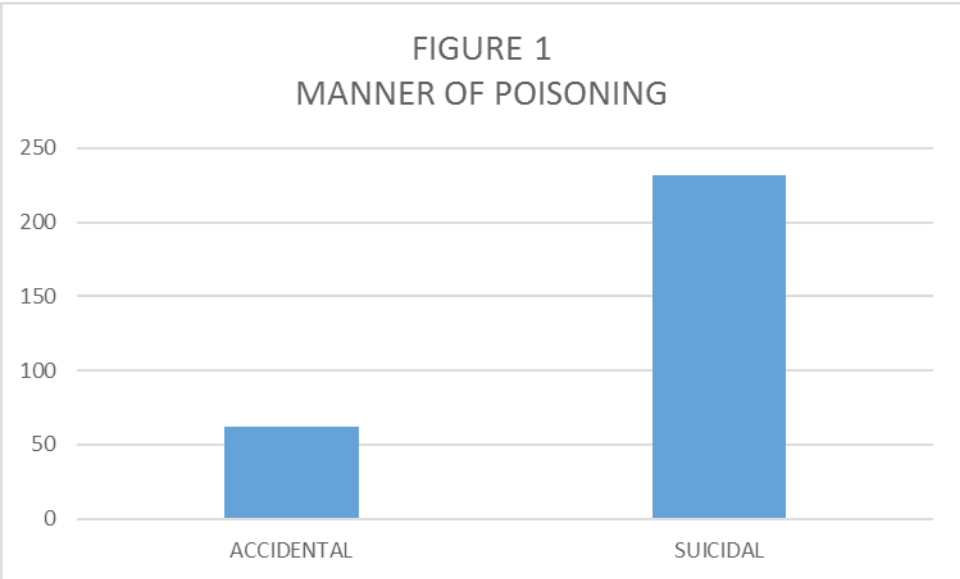
The study included all poisoning cases like household poisoning, agricultural poisoning, poisoning due to pharmaceuticals, food poisoning, and poisoning due to snake bite. The study population consisted of 294 cases that included people of all age groups, right from 5 months to 83 years. Details regarding age, sex, occupation, time taken of hospitalization after ingestion of poison, condition at the time of hospitalization, manner of poisoning, mode of administration, type of poison and marital status of the patient were collected from the hospital records, documented in a pre-structured proforma and analyzed. Socioeconomic status of the patient could not be analyzed as information regarding educational status and percapita income was not available.

***INCLUSION CRITERIA:****ALL CASES OF ACUTE CHEMICAL,PHARMACEUTICAL,FOODPOISONING AND SNAKEBITE CASES IRRESPECTIVE OF AGE AND SEX.*

***EXCLUSION CRITERIA:****CASES OF ANIMAL EVENOMATION(WITH THE EXCLUSION OF SNAKE BITE CASES) AND ALLERGIC DRUG REACTION.*

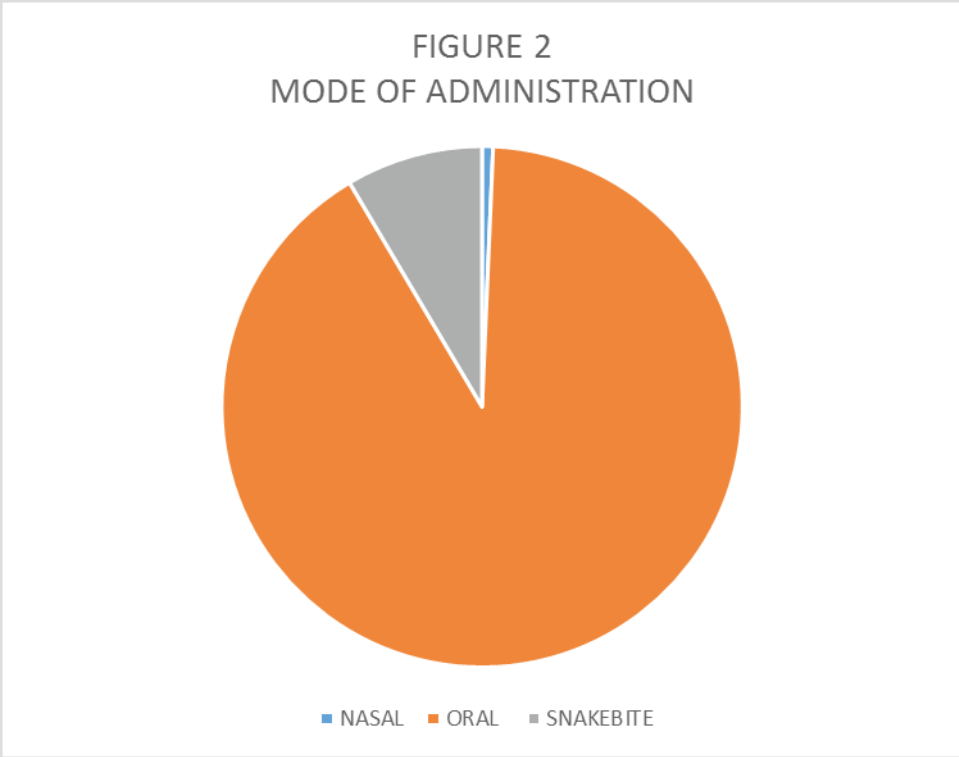
***RESULTS***

A total of 294 poisoning cases were reviewed, out of which, 232 (78.911%) were suicidal and 62 of them (21.088%) were accidental, indicating a majority to be of intentional type of poisoning [Refer FIGURE 1].



The study revealed that poisoning among female population (52.21%) was higher when compared to that of male population (42.278%) and it was found that poisoning was common among the unmarried (54.421%) than among the married (43.877%).

Among the cases reported, around 90.816% were found to be due to ingestion of chemicals like insecticides and other cleaning agents. Also poisoning due to snake bite and inhalation of toxic substances were reported [Refer FIGURE 2].




The incidence of poisoning was found to be the highest among individuals aged between 21-30 years followed by those aged between 11-20 years. Poisoning cases of individuals belonging to the age group 31-40 years, 41-50 years , those above 50 years and of those 10 years and below were reported[Refer TABLE 1].

**Table 1**

| **Age** | **No. of Poisoning Cases** | **Percentage** |
|---|---|---|
| LESS AND EQUAL TO 10 | 17 | 5.782 |
| 11-20 | 79 | 26.87 |
| 21-30 | 114 | 38.775 |
| 31-40 | 47 | 15.986 |
| 41-50 | 20 | 6.802 |
| 51-60 | 6 | 2.04 |
| ABOVE 60 | 7 | 2.38 |
| UNKNOWN | 4 | 1.36 |

Poisoning rates were high among skilled workers (69 out of 294 cases) and homemakers (52 out of 294 cases). Least number of cases were reported among the unemployed class.

**TABLE 2: Poisoning rate among people of different occupational status is as follows.**

| Occpation | No. of Poisoning Cases | Percentage Of Poisoning Cases |
|---|---|---|
| HOMEMAKERS | 52 | 17.687 |
| STUDENT | 51 | 17.346 |
| CLERICAL | 6 | 2.04 |
| CHILDREN[OF AGE GROUP 1-6 YEARS] | 13 | 4.421 |
| SEMI-PROFESSION | 16 | 5.442 |
| PROFESSION | 4 | 1.36 |
| SKILLED | 69 | 23.469 |
| UNSKILLED | 32 | 10.884 |
| UNEMPLOYED | 1 | 0.34 |
| UNDETERMINED | 50 | 17.006 |

**Refer TABLE 3. Analysis of the poisoning cases revealed poisoning rates to be high during the month of July, January, August and November**

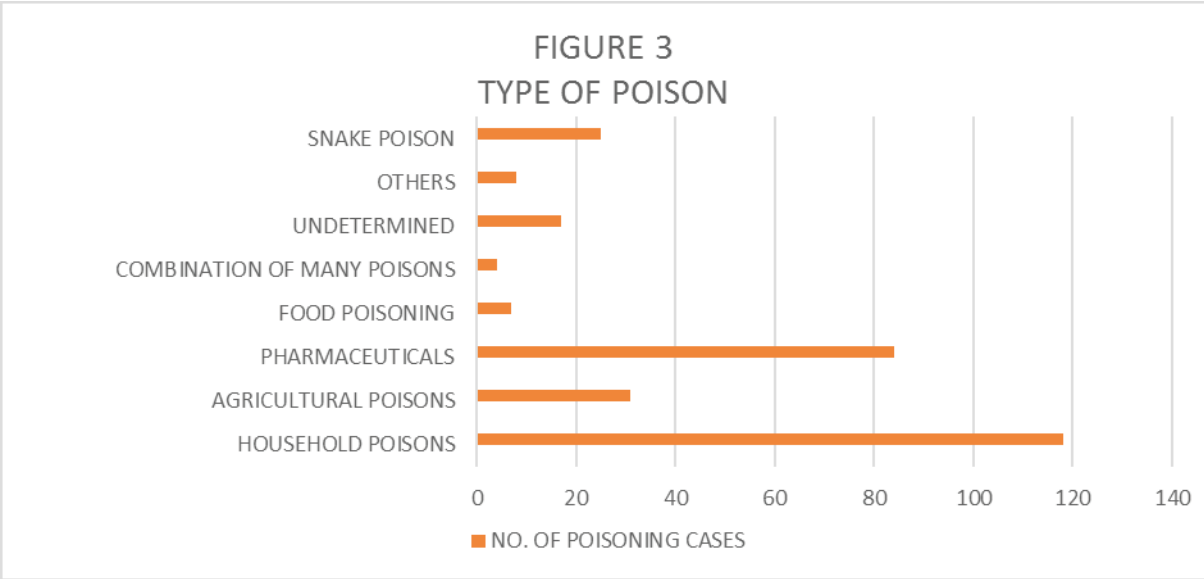
| MONTH | NO. OF POISONING CASES | PERCENTAGE OF POISONING CASES |
|---|---|---|
| JANUARY | 27 | 9.183 |
| FEBRUARY | 22 | 7.482 |
| MARCH | 23 | 7.823 |
| APRIL | 25 | 8.503 |
| MAY | 24 | 8.163 |
| JUNE | 9 | 3.061 |
| JULY | 40 | 13.065 |
| AUGUST | 27 | 9.183 |
| SEPTEMBER | 26 | 8.843 |
| OCTOBER | 26 | 8.843 |
| NOVEMBER | 28 | 9.523 |
| DECEMBER | 17 | 5.782 |

Most of the patients( about 96.598) were conscious at the time of hospitalization. Only 0.34% was found to be delirious, 0.68% to be semi-conscious and 2.38% to be unconscious.

The study revealed that the most common type of poison consumed were household poisons which included insecticides, rodenticides, detergents, disinfectants, kerosene, petrol, corrosive acids, disinfectants, medicated oil, rust preventive oil and matchsticks and pharmaceuticals which included antacids, anti epileptics, anti anxiety drugs, antibiotics, NSAIDS, antidiarrhoeal drugs, antidepressants,hypoglycemics, multivitamins, anti hypertensives, antihistaminics, antifungals, anti hypertensives, antimalarial, antiseptics, antitussives, antivirals, antiparkinsonian drugs, calcium channel blockers, antiadrenergics, hypolipidaemics, cholinesterase inhibitors, sedatives-hypnotics, iron and other nutritional supplements.There were also cases of poly pharmacy poisoning.

Agricultural poisons like fertilizers, herbicides, oleander leaves, pesticides, flowers and seeds were the second most common cause of poisoning. Accidental food poisonings have also been reported which included poisoning due to consumption of lizard fallen food and some seafood. Rate of poisoning due snake bite was found almost equal to that of agricultural poisoning.

Interestingly,poisoning due to combination of various substances such as calcium channel blockers and NSAIDS along with disinfectants, pesticides along with herbicides and rodenticides, rodenticides along with kerosene, rodenticides along with insecticides, thyroxine tablets along with disinfectants have been reported . Acetonide poisoning, poisoning due to ammonia, hydrocarbon, paint varnishes, paint thinners and tensene were also reported. Some of the poisons were undetermined .




**[ Refer FIGURE 3]: Type of poisoning is categorized as follows**

Out of the total poisoning cases reported, about 31.63% were hospitalized within the time frame of 1-3 hours after ingestion of poison. 29.591% were hospitalized within less than an hour, 11.34% hospitalized within 3-5 hours and the remaining after 5 hours of ingestion.

## Discussion

The occurrence of 294 cases in a single hospital within a period of 12 months signifies the seriousness of poisoning in this region. Poisoning rates were found to be high among the female population. Although it contradicts with studies like Bhagora et al.,Gopal et al.and Panda et al.,foreign studies like Tufekci et al and Kavalci et al support the present study with female dominancy in poisoning cases ([4-8]). Poisoning was more commonly seen in young adults ,especially in the age group of 21-30 years. Stress is believed to be the

major cause. Mental strain and pressure during studies, unemployment, financial problems,marital conflicts,etc., may aid the reason.

Most of the poisoning cases reported were found to be suicidal and showed similarity with results of studies like Sharma BR et al.,Karamjitsingh et al.,and Sanjeev Chaudhry et al [9-11]. Although accidental poisoning can occur at any age,it was found to be more common in children less than 10 years of age. Snakebite was the main cause for accidental poisoning. Almost all cases of suicidal poisonings were by the consumption of chemicals and other pharmaceutical agents.

In this study, poisoning rates among unmarried population outnumbered married ones that contradicts with other studies [12-15] , in which more no. of poisonings were seen among married people. The incidence of poisoning was higher during the months of July followed by November.This contradicts with studies conducted in India that showed more incidences during summer [16]. Some studies also show increase in poisoning during rainy season [17] and supports the present study. There are studies which show that there is a relationship between summer suicide rates and biochemical, metabolic and immune variables [18].

The study revealed increase in the number of poisoning cases due to household poisons. There is dissimilarity seen when compared to studies conducted in western countries [17,19,20] and in India, where agrochemicals were the most common poisoning agents [14, 16, 21, 22]. Household poisons consumed included insecticides and rodenticides. Availability of different kinds of household products due to advancement in science has a influence on the increase in intentional household poisoning. Easy accessibility of drugs has made them the second most common poisoning agent. Occupation and area of residence has an influence on the availability of poisons. In the previous decade farmers were more in number and used agrochemical agents as poisons. But today, with development of industries and increased manual empowerment, there is a change seen in the type of poison consumed. People have better access to pharmaceutical agents and household poisons. The area where this hospital is located has many industries in the neighborhood and hence shows a rise in poisoning due to household poisons and pharmaceuticals.

## Conclusion

In the present study,females were affected more than males with the higher of incidence among people of 21-30 years of age.Unmarried cases outnumbered married ones.Most common type of poisons administered were household poisons.Among them majority were insecticides and rodenticides.Incidence of poisonings were found to be the highest among skilled workers,particularly company workers which may be due to the prevalence of multiple companies in the area .

Highly equipped treatment facilities, establishment of poison information centers and surveillance centers have become the need of the hour.Extending psychiatric services to the community may help in identifying high risk population who are likely to commit deliberate self-harm.

**Conflict of Interest:** Nil

**Source of Funding**: NIL

**Ethical Clearance:** Nil

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# Amputation of Penis Due To Electrocution- A Case Report

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## Abstract

Electricity is an integral part of modern society. Without electricity the existence of human life seems difficult, but it has the capacity to stand life and destroyed the life up to the death. The most fatalities caused due to electricity are accidental and result from passage of an electric current [both low & high voltage] through the body. Penile trauma presents a difficult physical and psychological problem and is rare. The causes of penile trauma are varied; it can be iatrogenic or caused by traffic accidents, thermal and electric burns, ritual circumcision, animal bites, gunshots or self-mutilation. The type and extent of penile trauma varies from mild to severe injuries, sometimes even with total amputation.

In the present case, a 24 year old young male from Palwal (Haryana) sustained electric burn injuries while he was standing in the balcony and came in contact with high voltage electric wires passing in front of the balcony. He was admitted in Safdarjung hospital, Delhi and expired on the same day. During autopsy electric contact burn marks were present on unusual sites of the body like head, neck, abdomen, pubic region and root of penis with amputation of penis. Electric flash burns were also present on different parts of the body along with fracture of cervical vertebra.

***Key Words:*** *Electricity, Electric current, Electric burn injuries, Electrocution, Penile trauma, Amputation of penis.*

## Introduction

Electricity is an integral part of modern society. Without electricity the existence of human life seems difficult, but it has the capacity to stand life and destroyed the life up to the death. The most fatalities caused due to electricity are accidental and result from passage of an electric current [both low & high voltage] through the body. Suicides and homicides from electrocution are very rare.[1] In comparison to western countries India shows relatively higher incidence of electrocution.[2] Penile trauma presents a difficult physical and psychological problem and is rare, because the penis is a mobile organ enveloped into loose skin, well protected by its position; however, the penis is more prone to trauma during sexual intercourse while rigidly erect.[3] The causes of penile trauma are varied; it can be iatrogenic or caused by traffic accidents, thermal and electric burns, ritual circumcision, animal bites, gunshots or self-mutilation.[4,5,6,7] Reports of trauma to the external genitalia are sporadic. The type and extent of penile trauma varies from mild to severe injuries, sometimes even with total amputation. [8]

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**Case history:**

A 24 year old young male from Palwal (Haryana) sustained electric burn injuries on 11/11/2018 at around 5:30 AM while he was standing in the balcony and came in contact with high voltage electric wires passing in front of the balcony. He was initially taken to a private hospital at Palwal. Then referred and admitted at Safdarjung Hospital, Delhi on 11/11/2018 at 09:10 AM where he died while undergoing treatment on 12/11/2018 at 12:00 AM.

**Autopsy findings:**

Dead body was of a male wrapped in white coloured hospital sheet. Moderately built, Cornea was hazy. Rigor mortis was present all over the body. Post mortem staining was present over back except pressure and burnt areas, and was fixed.

**Antemortem external injuries:**

(1) Electric contact burn marks, 2 in number, of sizes 5 cm x 3.5 cm x scalp tissue deep and 3 cm x 2 cm x scalp tissue deep respectively were present over back of head on left side. Margins were irregular, everted and base was indurated. Surrounding area was pale. Blackening was present around the wound. Scalp hair were singed at places. (Fig. 1)

(2) Electric contact burn mark of size 12 cm x 5 cm x muscle deep was present over nape of neck. Margins were irregular, everted and base was indurated. Surrounding area was pale. Blackening was present around the wound. (Fig. 1)

(3) Electric contact burn mark of size 7 cm x 3 cm x subcutaneous tissue deep was present horizontally over right side front of abdomen, situated 10 cm below the umbilicus. Margins were irregular, everted and base was indurated. Surrounding area was pale. Blackening was present over and around the wound. (Fig. 2)

(4) Electric contact burn mark of size 12 cm x 3.5 cm x muscle deep was present horizontally over pubic region on right side. Margins were irregular, everted and base was indurated. Surrounding area was pale. Blackening and charring was present over and around the wound. (Fig. 2)

(5) Electric contact burn wound of size 5 cm x 4.5 cm x muscle deep was present over root of penis and penis was amputated and missing. Margins were irregular and everted, and base of wound was indurated. Blackening and charring was present over and around the wound. (Fig. 2)

(6) Epidermal to dermo-epidermal electric flash burn injuries were present in patches over face and neck, in patches over back of chest, in patches over front of abdomen, external genitalia and in patches over left forearm. Right upper limb including both palms, front of chest, back of abdomen and both lower limbs including soles were spared. Total electric flash burn injury involved about 20 % of total body surface area. Burnt area showed redness, peeling and blackening of skin at places. (Fig. 1, 2, 3)

**Internal examination:** Cervical vertebra was fractured at C3-C4 vertebral level with blood extravasation at fractured site. Underneath spinal cord was contused. Lungs were congested and edematous. Stomach was empty with no unusual smell and normal mucosa. All other organs were congested.

Opinion regarding cause of death was given as shock as a result of electrocution.

**Fig. 1- Figure showing electric contact burn marks over back of head and nape of neck, and electric flash burn injuries**

**Fig. 2- Figure showing electric contact burn marks over front of abdomen, pubic region and penis with amputation of penis due to electrocution, and electric flash burn injuries**

**Fig. 3- Figure showing electric flash burn injuries over face, neck, shoulder and upper part of back of chest**

## Discussion

In a study done by the auther in Bangalore, majority 48.8% of electrocution cases were young adults in the age group of 21-30 years followed by 31-40 years which include 17.1% cases. Majority of victims of fatal electrocution were male (85.4%) and only 14.6% were female.[9] The studies conducted by Guntheti BK et al[1], Rajesh B et al[10] and Shaha KK et al[11] also reported that most of the victims were from 21-30 years age group. Similar findings of male dominance were also reported by them.

In the present case also the victim of electrocution was a 24 year old young male.

The reason for such a marked male predominance of young age in a variety of studies from different communities is probably the fact that mostly males of young age are involved in the electrical works.

Accidental electrocution among these would have occurred because of carelessness, ignorance, haste, malfunction of appliances or equipment such as ineffective insulation, lack of protective earthing, faulty grounding and short circuits.[12]

In a study conducted by Ragui S et al[13] in Manipur, most of the victims were electrocuted on the road side (68%) and the remaining victims were electrocuted in their houses. While in a study conducted by Pathak AK et al[14] at Jaipur 70% victims were electrocuted at home.

In the present case the victim got electrocuted at home while he was standing in balcony.

In the study done by the auther in Bangalore, in most of the cases (46.3%), there were only entry wounds. While in 29.3% cases both entry and exit wounds were seen. Electrical flash burns were seen in 36.6% cases. Majority of cases (75.6%) showed electric contact marks present on upper limbs including palms and fingers.[9] This usual site of electric entry mark is also mentioned in many textbooks.[15,16] In a study conducted by Rajesh B et al[10], 44.5% cases showed only entry wounds while in 27.8% both entry and exit wounds were present. In the study conducted by Guntheti BK et al[1], 40.3% cases showed only entry wounds, 35.48% cases showed both entry and exit wounds. While 25.8% cases showed flash burns.

In the present case both electric contact burn marks and electric flash burns were seen. Electric contact burn marks were present on unusual sites of the body like head, neck, abdomen, pubic region and root of penis with amputation of penis. Fracture of cervical vertebra also present.

## Conclusion

The etiology of penile trauma varies but ranges from self-infliction in psychiatric patients, to industrial accidents or assaults, and rarely from circumcision mishaps. The traumatic amputation of the penis in adults following electrocution is rare. Whenever it happens, it can be devastating to the patient, his spouse and his relatives.

The risk of getting electrocuted from the haphazardly installed electric wires without proper maintenance and careless use of electrical appliances is the matter of concern. Nevertheless, spread of awareness and adoption

of safety measures are important factors required for prevention of fatal electrocution and penile trauma.

**Acknowledgement:** All teaching staffs, senior residents and junior residents of Department of Forensic Medicine & Toxicology, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi.

**Conflict of Interest-** None.

**Financial Assistance:** None.

**Ethical Clearance-** Not applicable.

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# Towards Digital Diagnosis of Oral Cancer: A Study on Optimum Preferences of Histopathological Techniques and Features

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## Abstract

Accurate diagnosis is dependent on various factors in the pathological domain, like types of slides used and features scrutinized. Sometimes a diagnosis is evident due to clear symptoms. But under adverse constraints, like improper acquisition etc., it is very difficult to give a quick and clear diagnosis. The study aims to conduct a survey from the well-known histopathologists of the country to gather an understanding of the techniques preferably used by them for diagnosis of the disease and summarize it, for arriving at optimum options which may be adopted for automation. This was a cross-sectional study conducted from March 2018 to May 2018 using a pre-tested structured questionnaire of multiple answer choices. The study subjects comprised of resident histopathologists of the hospitals covering states/locations all over the country, by selective sampling. The hospitals were selected based on the availability of on-site pathology centres and wide coverage. The analysis of the data was done using Ms-Excel and SPSS. The Non-Parametric Friedman Test was conducted to test for significance of the responses. Oral Squamous Cell Carcinoma (OSCC) of buccal mucosa with both moderately and well-differentiated grades were reported. For diagnosis, H&E stain for the slides of 4μ thickness is mostly used. Further, invasion of basement membrane was the most important architectural feature and increased nucleo-cytoplasmic ratio the most important cytological feature. This type of survey will help in carrying out a directed diagnosis or further research for automated diagnosis using the results.

***Keywords:*** *Oral cancer, Diagnosis techniques, Feature study, Preference, Survey*

## Introduction

Healthcare costs will need to reduce if we are to treat more people. The area of diagnosis offers possible significant cost reduction while improving accuracy by using technology. Recent times have witnessed an increase in the incidence of cancer.[1] According to the World Health Organization, 6,57,000 new cases of cancers of the oral cavity and pharynx are estimated each year and more than 3,30,000 demises.[2] This is mainly because of urbanization and industrialization which leads to a major change in lifestyle and exposure to environmental pollution. It is well known that cancer incidence in urban population is nearly double that of the rural population. Further other important factors like demographics, increased life expectancy and access to healthcare contribute to the cause. Morbidity due to cancer is almost double in the rural population than the urban population.[3] Clear causes are poverty, illiteracy, ignorance, myths of the disease and access to cancer facilities. Oral and oropharyngeal carcinomas still continue to hold the sixth most common cancers in the world.[4] Surveillance, Epidemiology, and End Results (SEER) 9 registries of the National Cancer Institute of the United States Public Health Service, 2018 report shows the following statistics.[5]

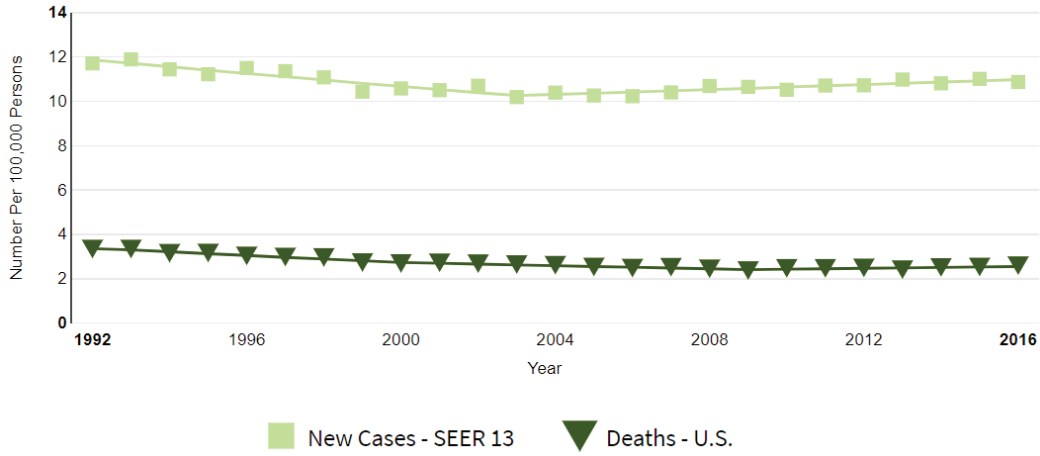


**Figure 1: Trends in incidence rates of cancer of the oral cavity and pharynx from 1975-2015**

Head and neck cancers are a major concern worldwide and especially in North-East India. National Cancer Registry Programme declares that, in India, oral cancer is the most common cancer amongst men (16.1 % of all cancers) and the second most common cancer amongst women (10.4 % of all cancers). According to Globocan 2018 (it is an online database providing estimates of incidence and mortality in 185 countries for 36 types of cancer, and for all cancer sites combined) data, new cases registered for oral cancer is 1,19,992. The total number of demises in men and women together is 72,616.[6]

**Figure 2** shows the proportion of mouth, tongue and other oral cancers incident in patients of North-East India, as per latest report of Dr. B. Borooah Cancer Institute (BBCI), a grants-in-aid institute of Department of Atomic Energy, Government of India, and a unit of Tata Memorial Centre, Mumbai, and the premier institute of cancer treatment in the region.

Two points are noteworthy regarding oral cancer control and treatment management. First, as per WHO recommended priorities and strategies for prevention and control of Oral (Mouth and Pharynx) cancer, Primary prevention is very effective and early detection is partly effective.[7]

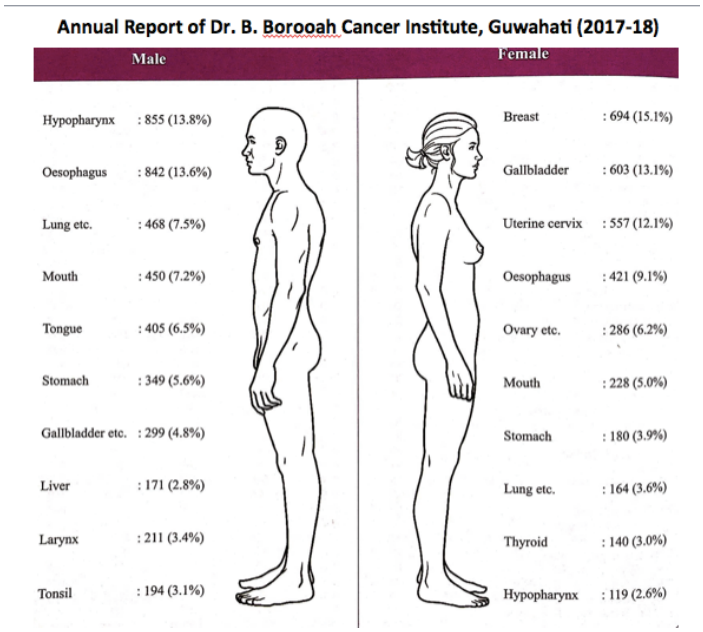


**Figure 2: Distribution of various types of cancers by site in male and female**

Hence, coupling the two together gives a direction for activating control programmes. Secondly, more than 80% of the diagnosis of oral cancers is done on the basis of microscopy. Accurate and timely diagnosis is the major strategy, as well as a challenge for lowering the incidence of the disease and follow-up clinical treatment. It itself is a by-product of various inputs, starting from the type of slide to type of stains used and types of features inspected and analysed. This stimulates us to conduct a survey in this direction to gather some information from the well-known histopathologist of the region, so as to make a bucket list of the most important parameters required for generating a fast yet accurate diagnosis. For the survey, we have designed a questionnaire consulting with highly experienced pathologists. The queries placed through the questionnaire carries significance as it gives us ample insight into understanding the techniques used by the pathologist for the diagnosis of the disease. Our aim is to utilize the information hence collected, for development of algorithms for automated oral cancer diagnosis, so that the software may be as realistic as possible and may relate well with the process followed in the region.

## Materials and Method

### *Study Population and study design*

This survey was conducted from March 2018 to May 2018. The study subjects comprised of resident histopathologists of the hospitals who were sent the questionnaires by post and contacted either by phone or email for intimation. The study does not involve any ethical clearance as no experiments were done on the participants. This is a cross-sectional study covering states/locations (Assam, Meghalaya, Manipur, Kolkata and Kerala) all over the country, by selective sampling. In total, 110 questionnaires were sent to the histopathologists of different hospitals and well-known diagnostic centres of India. The hospitals were selected based on the availability of on-site pathology centres and wide coverage.

### *The Questionnaire*

All information was obtained by using a pre-tested structured questionnaire with multiple answer choices (**Annexure 1**). Then data were compiled in an excel sheet and calculations and data analysis was done with the help of SPSS-14 version. The questionnaire consisted of two parts. The first part contained the questions regarding preferred broad techniques related to the detection of oral cancer from biopsy sections. In the second part, some additional questions were put forward to understand in detail the common features observed by the pathologists for detection of malignancy.

It was also queried "What is the maximum time taken to investigate one slide?" Finally, pathologists were asked whether any automated imaging system was used for diagnosis. Response category for this question was "Yes" and "No". For each query, the respondents were offered to give all their options, with priority if so entailed.

### *Analysis*

The analysis of the data was done using Ms-Excel (Ver 2016) and SPSS (14). The data were coded and entered in SPSS where the Non-Parametric Friedman Test was conducted to test for significance of the responses.[8] The Friedman test is most suitable for the study as the responses are all 'ordinal', that is being scaled according to preferences stated by the respondents. It is further appropriate because the data may not be normally distributed. To calculate the percentage of preference for the questions with priority choice, weights were assigned. Highest weight was given to the first choice, and so on in reverse order. The study tested for the perception of pathologists about the response to different questions. Thus null hypotheses formed for each response were "there is a difference in perception or preference between the pathologists regarding the responses".

## Findings

75 responses were received (68.18 %) out of 110 questionnaires mailed. All the pathologists (100%) viewed squamous cell carcinoma as the most common histological type of oral cancer diagnosed in their laboratories. The number of choices per question is shown in the following table [**Table 1**].

From the study, it was observed that 43.5% opted for buccal mucosa as the most common site of occurrence followed by 17.4% for gingivobuccal sulcus, 13% for tongue, 7.2% for alveolus, 5.8% each for lip and base

of the tongue, 4.2% for gingiva and 2.9% for retromolar trigone. The percentage of choices were calculated and are depicted in **Figure 3**.

Further, as per the survey, both well-differentiated grades and moderately differentiated grades have been found to be in the leading position with 48 cases. Poorly differentiated grade was in the second position with 11 cases. Regarding preference of thickness of biopsy section/sample used for preparing a slide, most of the laboratories 43.9% preferred 4µ thickness, followed by 17.1%, 12.2% and 7.3% preferred for 3µ, 5µ and 6µ respectively.

All 75 laboratories (100%) uses Hematoxyline and Eosin stain for a routine examination. 31 pathologist (22.7%) considers the invasion of basement membrane as the most important architectural feature to diagnose malignancy. 22 pathologists agreed on the invasion of sub-epithelial tissue/other tissue as the second most important architectural feature to diagnose malignancy and 20 put loss of polarity of basal cells in third place. A maximum number of pathologists (22.7%) considers increased nucleo-cytoplasmic ratio as the most important cytological feature to diagnose cancer followed by hyperchromasia (19.2%) and atypical mitotic figures (17.4%).

Response to the question "Maximum time taken to investigate one slide" varies from 1 minute to 1 hour. Further, no histopathologist reported uses of any automated imaging system for diagnosis in their laboratories.

The test-statistic of Freidman test, viz. Chi-Square is like a variance over the mean ranks: it's 0 when the mean ranks are exactly equal and becomes larger as they lie further apart. Also, *p* is the probability of finding our sample differences, i.e. if the population distributions are equal. The mean ranks of the responses, chi and respective *p*-values of the test are shown in the last two columns of **Table 1**.

**Table 1: Response of respondents on general observations**

| Question | Response choices | No. of responses | Mean ranks | Chi (p) |
|---|---|---|---|---|
| most common histological type of oral cancer diagnosed | Squamous cell carcinoma | 75 | 5.00 | 132.000 (.000) |
| | Verrucous carcinoma | Nil | 2.50 | |
| | Minor salivary gland carcinomas | Nil | 2.50 | |
| | Lymphomas | Nil | 2.50 | |
| | Other | Nil | 2.50 | |
| Most common site of occurrence | Lip | 7 | 4.64 | 66.860 (.000) |
| | Gingiva | 7 | 4.50 | |
| | Gingivobuccal sulcus | 32 | 5.73 | |
| | Alveolus | 11 | 4.77 | |
| | Buccal mucosa | 52 | 6.83 | |
| | Tongue | 30 | 5.29 | |
| | Base of tongue | 11 | 4.62 | |
| | Retromolar trigone | 5 | 4.36 | |
| | Other | Nil | 4.26 | |
| maximum reported grades of OSCC | Well-differentiated | 48 | 2.20 | 12.071 (.002) |
| | Moderately differentiated | 48 | 2.20 | |
| | Poorly differentiated | 11 | 1.61 | |

***Cont...*** **Table 1: Response of respondents on general observations**

| | | | | |
|---|---|---|---|---|
| Thickness of biopsy section/sample used for preparing slide (in µ) | 3 | 16 | 3.03 | 29.108 (.000) |
| | 4 | 36 | 3.86 | |
| | 5 | 16 | 2.88 | |
| | 6 | 7 | 2.73 | |
| | Other | Nil | 2.50 | |
| Stain used for routine examination | Hematoxyline and Eosin | 75 | 2.00 | 33.000 (.000) |
| | Other | Nil | 1.00 | |

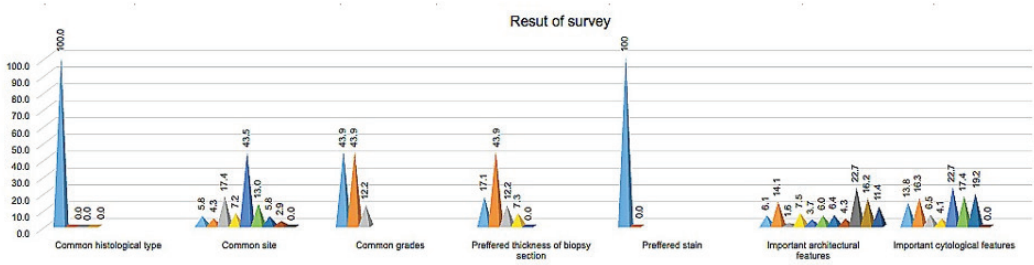


**Figure 3: The percentage of choices of different responses**

## Discussion

According to the SEER (Surveillance, Epidemiology, and End Results program of the National Cancer Institute of the United States Public Health Service) registries in the USA between 1973 and 1987, of all the oropharyngeal malignancies reported, more than 95% were squamous cell carcinomas.[9] Other studies have corroborated that OSCC is the most common oral malignancy, representing up to 80–90% of all malignant neoplasms of the oral cavity.[10,11] The incidence of OSCC remains high.[12,13] 90% of all oral malignancies involve with OSCC.[13-16] As per the latest report of Dr B. Borooah Cancer Institute, 95% of head and neck cancers are squamous cell carcinoma. Likewise, in our study, we got 100% responses for OSCC. Other epidemiological studies found that tongue, lip, and floor of the mouth were the most frequent sites of lesions of OSCC.[17-19] Studies reported buccal mucosa and mandibular alveolus as most common sites too[20,21] and that the lip and tongue were the most and second most common site of OSCC.[21,22] The report of the findings is presented in **Table 2**.

**Table 2: Response of respondents on features for the diagnosis**

| Question | Response choices | No. of responses | Mean ranks | Chi (p) |
|---|---|---|---|---|
| Most important architectural feature to diagnose malignancy | Irregular epithelial stratification | 11 | 5.55 | 54.336 (.000) |
| | Loss of polarity of basal cells | 20 | 7.42 | |
| | Drop-shaped rate ridges | 2 | 4.18 | |
| | Increased number of mitoses | 13 | 6.05 | |
| | Abnormally superficial mitoses | 7 | 5.00 | |
| | Premature keratinization in single cell | 9 | 5.14 | |
| | Intraepithelial keratin pearls | 10 | 5.56 | |
| | Loss of intercellular attachment | 8 | 5.36 | |
| | Invasion of basement membrane | 31 | 7.67 | |
| | Invasion of sub-epithelial tissue/other tissue | 22 | 6.82 | |
| | Lymphatic and vascular invasion | 18 | 7.26 | |

***Cont...*** **Table 2: Response of respondents on features for the diagnosis**

| | | | | |
|---|---|---|---|---|
| Cytological features observed | Abnormal variation in nuclear size | 18 | 3.97 | 78.049 (.000) |
| | Abnormal variation in nuclear shape | 23 | 4.85 | |
| | Abnormal variation of cell siz | 12 | 3.92 | |
| | Abnormal variation of cell shape | 8 | 3.56 | |
| | Increased nucleo-cytoplasmic ratio | 32 | 6.67 | |
| | Atypical mitotic figures | 28 | 4.56 | |
| | Hyperchromasia | 30 | 5.92 | |
| | Other | Nil | 2.55 | |

As evident from the Friedman analysis, all the *p* values are highly significant and hence all the null hypotheses are rejected. It is henceforth summarized that there is a marked difference in perception of the pathologists about the histological methods and features used for evaluation of slides. Further, if choice is to be made for best 5 features for digitization, then that would be, in descending order of priority.

i) Invasion of basement membrane, Invasion of sub-epithelial tissue/other tissue, Loss of polarity of basal cells, Lymphatic and vascular invasion, and Increased number of mitoses for architectural analysis, and

ii) Increased nucleo-cytoplasmic ratio, Hyperchromasia, Atypical mitotic figures, Abnormal variation in nuclear shape, Abnormal variation in nuclear size for cytological analysis respectively

## Conclusion

North-East India is considered to have the highest occurrence of oral cancer across the country. We have conducted this nation-wide survey to gather some useful information about the diagnosing techniques used by the pathologists and to summarize them, so as to identify the optimum ones. This information may be adequately used to incorporate into algorithms for automated detection and diagnosis of oral dysplasia, for researchers who want to carry out research in the area of digital pathology.

**Acknowledgement** The authors thank all the pathologists who had contributed in deriving a significant inference out of this survey with their valuable inputs. The first author would like to acknowledge the Department of Science and Technology (DST), Government of India for proving fund under Women Scientist-A scheme (SR/WOS-A/MS-11/2013 date 20.08.2014) for this study.

**Ethical Clearance:** Not applicable

**Source of Funding:** Department of Science and Technology (DST), Government of India

**Conflict of Interest:** None

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# Trauma to the Thoracic Cage – An Autopsy Study

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## Abstract

**Background:** Injuries of the chest causing disruption of the thoracic cage are increasing daily. Thoracic cage may be injured due to blunt trauma like blows, compression of chest or grinding force of automobile run over or due to penetrating injuries.

**Method:** This study analysed the pattern of injury thoracic cage in victims in trauma. 250 cases brought to a tertiary care institution for autopsy were studied from 1st January 2005 to 30th November 2005(1st July 2005-30th November prospectively, and 1st January-30th June 2005, retrospectively). A cross sectional study design including all cases of trauma to the thorax and heart with consecutive sampling was done. Data was collected in pro forma and analysed.

**Results**: 206 victims were males. 130 (52%) were victims of road traffic accidents Pedestrians constituted the majority (26.4%). External injuries were not found in 67 cases (26.8%). Involvement of rib alone constituted 93 cases (37.2 %) followed by combination of rib and lung 54 cases (21.6 %), rib and sternum 13 cases (5.2%), sternum and lung 12 cases (4.8 %) and combination of various other organs occurred in 67 cases (26.8%). Simple fractures were the common rib injury in both sides. 34 cases (13.6%) with vertebral injuries were observed and 19 were associated with spinal cord injury.

**Conclusions**: There is little that the autopsy surgeon can contribute to elucidate the factors leading to accidental deaths. Multiple regression is useful to correlate between predictor and outcome variables. Hopefully, future research will improve the methodology to predict the outcome of trauma to thoracic cage accurately.

***Keywords****: fracture, rib, vertebrae, sternum, injury, chest, trauma, death*

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## Introduction

### Anatomy of Thorax

The thorax (chest) is the region of the body between the neck and abdomen. The frame work of the walls of the thorax, the thoracic cage, is formed by the vertebral column behind, the ribs and intercostal spaces on either side, and sternum and costal cartilages in front. Superiorly the thorax communicates with the neck and inferiorly it is separated from the abdomen by the diaphragm. The thoracic cage protects the lungs and heart and affords attachments for the muscles of the

thorax, upper extremity, abdomen and back[1].

The thoracic wall is covered on the outside by skin and muscles and lined inside with parietal pleura[1]. It is formed posteriorly by the thoracic part of the vertebral column, anteriorly by the sternum and costal cartilages, laterally by the ribs and intercostal spaces, superiorly by the suprapleural membrane and inferiorly by the diaphragm[1,2,3]. The sternum, a flat bone which lies in the middle of the anterior thoracic wall, consists of manubrium sterni, body and xiphoid process[1,2,3,4]. The xiphisternal joint lies opposite the body of the ninth thoracic vertebra[5]. There are twelve pairs of ribs, each with a head, neck, tubercle and body (shaft). Each one articulates posteriorly with the vertebral column. Thoracic vertebrae are twelve in number and can be recognized by the presence of at least one articular facet on the body for articulation with their ribs[6].

Fracture of sternum is rare. The fragments either remain in position or the upper portion passes backwards behind the lower, and are liable to damage the viscera behind it. The driver may be thrown forward and strike the chest on the steering wheel or upper abdomen on the wheel rim or the horn boss may strike the sternum and produce a transverse fracture[4]. Fracture of sternum is seen as a result of deceleration on to seat belts[7].

The most common blunt thoracic injury in both adults and children are rib fractures[8,9,10]. Rarely a rib may be partly or completely cut by a stab or it may form a part of projectile in fire arm injury[11]. Markedly elastic ribs of a child may escape fracture[12,13,14]. In children and in young adults, the chest wall is very mobile as the calcification is incomplete, fatal injuries may be inflicted upon the heart, lung and great vessels, without any fracture to the rib cage or breast bone[15]. In infants especially victims of child abuse, rib fracture (knobbing fracture) are common[8,16]. Many of the fractures in indirect violence are oblique[11,17]. Fractures of the ribs occur in the regions of maximum stretch, hence anteroposterior compression of chest causes fractures at the necks and costochondral junctions[18].

Shoulder restraints are responsible for fracture of ribs, cervical spine, lumbar spine and sternum; skin and subcutaneous tissue injury and deep organ lesions of larynx, liver, spleen, kidney, major vessels and diaphragm[1,2,9,14,19].

A flail chest occurs when a segment of the chest wall does not have any bony continuity with the rest of the thoracic cage[20]. This condition usually results from automobile accidents. Flail chest results in independent and paradoxical movement of chest wall. Associated pain with restricted chest wall movement and underlying lung injury contribute to the patient's hypoxia[21]. External cardiac massage causes fracture at the costochondral junction, especially at the third to fourth ribs on the left side with minimum bruising[22,23].

## Objectives

### Primary Objective

To describe the pattern or profile of injury to thoracic cage.

### Secondary objectives

1. To evaluate the nature and intensity of the injuries of sternum, ribs, vertebrae and spinal cord.

2. To analyse the medicolegal aspects of thoracic cage injuries.

## Materials and Method

This study is part of a larger study including 250 cases of trauma to chest, which aimed at analyzing the pattern of injuries sustained to thorax following various types of trauma, with special reference to thoracic cage. 250 known dead bodies of both sexes with thoracic injuries brought for medicolegal autopsies to the mortuary of the Department of Forensic Medicine in a tertiary care institution were included in the present study. All cases from 1st July 2005 till 30th November were selected prospectively and from 1st January till 30th June 2005, retrospectively. Among the 250 cases, 236 were found to have thoracic cage injuries and have been included in this study. Descriptive study design was followed.

A meticulous external examination was made and details were entered in a proforma. Autopsy was conducted by modified Rokitansky's method of *in situ* dissection in part and *en masse* removal. All thoracic organs and bones were examined for injury and when present, details of injuries were recorded and photographed.

## Observations

Of the 250 cases investigated, 67 (26.8%) did not have external injuries. Abrasion contributed 85 cases (34%), contusion 33 (13.2 %), lacerated wounds were rare (1; 0.4 %). Remaining 64 cases (25.6%) were a combination of various other injuries (Table 2). 45 cases showed sternal fracture (18%), of which 13(28.9%) were due to traffic accidents and 12(26.7%) were fall from height (Table 1). One (2.2%) incidence was due to cardiopulmonary resuscitation. The most vulnerable site of sternal fracture was found to be between manubrium and body of sternum (Table 3).

Fracture of rib was noted in 236 cases (94.4%). Majority were due to traffic accidents, in which 51 (21.6%) showed right side alone, 25 (10.6%) left side alone and 49 (20.7%) showed a bilateral involvement. Rib fracture was observed in fall from height in 46 (19.5%) cases, with right side in 15 (6.3%), left side 14 (5.9%) and bilateral in 17 (7.2%) cases. Cardiopulmonary resuscitation caused rib fracture in 3 (1.2%) cases and that was to the left side. Bilateral involvement of ribs was reported in 104 cases (41.6%). Involvement of right side alone was reported in 76 cases (30.4%) and that of left side was seen in 56 cases (22.4%). 14 cases (5.6%) did not have any fracture to the ribs.

129 cases (51.2%) had simple injuries to the right side and was the commonest type. Multiple injuries were reported in 34 cases (13.6%) followed by a combination of injuries in 16 (16.4%). Injury due to nick was reported in one case (Tables 3,4).

On the left side simple fracture is the commonest type of injury with 105 cases (42%). Multiple fractures occurred in 36 cases (14.4%). Both simple and multiple in 10 cases (4%). In 7 cases (2.8%) a cut or nick were noted. On the left side multiple site were affected in 32 cases (12.8%). Front aspect alone was affected in 30 (12%) and angle alone was affected in 17 cases (6.8%). In 52 (20.8%), single or other combinations of sites were noted. In 89 cases (35.6%) there was no fracture on the left side (Tables 3,4).

Regarding the total number of ribs affected in various types of injuries, the highest incidence is with 8 ribs, in 26 cases (10.4%) on right side and 20 cases (8%) on left side. Regarding the site, front aspect was found to be most vulnerable, in 38 cases (15.2%). Back aspect was affected in 34 (13.6%) and multiple sites were affected in 53 cases (21.2% %). 1$^{st}$ rib was injured in 64 cases on right side and 51 on left side. 16 cases and 10 cases on right and left sides showed whole ribs fractured. 3$^{rd}$ to 10$^{th}$ ribs showed maximum involvement (Table 13). 11$^{th}$ and 12$^{th}$ ribs seen fractured in 28 cases.

Thoracic vertebral injuries occurred in 34 cases (13.6%). Fractures of body $T_5$ and $T_{10}$ occurred with equal frequency of 3 cases (1.2%). Fracture separation between $T_2$ and $T_3$ occurred in 5 cases and that between $T_8$ and $T_9$ in 4 cases. In 15 cases fractures occurred in other levels (Table 5). Spinal cord injuries were reported in 19 cases of which in 9 (3.6 %) were contusion, 2 laceration and transection in 8 cases (3.2 %) (Figure 1).

**Table 1 Causes of Trauma to chest**

| Cause of Injury | No. of cases | Percentage |
|---|---|---|
| Traffic | 130 | 52.0 |
| Fall from height | 46 | 18.4 |
| Stab | 10 | 4.0 |
| Railway occurrence | 27 | 10.8 |
| Fall of heavy objects | 11 | 4.4 |
| Fall from Boat | 3 | 1.2 |
| CPR | 4 | 1.6 |
| Blow | 3 | 1.2 |
| Industrial Accident | 1 | 0.4 |
| Run over ( Road) | 5 | 2.0 |
| Run over ( Rail ) | 10 | 4.0 |
| Total | 250 | 100 |

**Table 2 Showing Distribution of External Injuries**

| Injury | No. of Cases | Percentage |
|---|---|---|
| Abrasion | 85 | 34 |
| Contusion | 33 | 13.2 |
| Laceration | 1 | 0.4 |
| Combination of Injuries | 64 | 25.6 |
| No injury | 67 | 26.8 |
| Total | 250 | 100 |

**Table 3 Showing Distribution of site of Sternal Fractures**

| Site | Penetrating | Blunt Direct | Blunt Indirect | Total | % |
|---|---|---|---|---|---|
| No injury | 9 | 179 | 17 | 205 | |
| Manubrium / Body | 1 | 13 | 0 | 14 | 82 |
| 1st -2nd | 0 | 6 | 4 | 10 | 5.6 |
| 2nd- 3rd | 0 | 6 | 2 | 8 | 4 |
| 3rd- 4th | 1 | 4 | 1 | 6 | 3.2 |
| 4th- 5th | 0 | 0 | 1 | 1 | 2.4 |
| Man/body & 2nd- 3rd | 0 | 1 | 0 | 1 | 0.4 |
| Man/ body & 4th -5th | 0 | 3 | 0 | 3 | 0.4 |
| Fragmentation | 0 | 2 | 0 | 2 | 1.2 |
| | | | | | 0.8 |
| **Total** | **11** | **214** | **25** | **250** | **100** |

**Table 4 Distribution of Injuries to ribs and side affected**

| Side | Penetrating | Blunt direct | Blunt Indirect | Total | % |
|---|---|---|---|---|---|
| No injury | 3 | 11 | 0 | 14 | 5.6 |
| Right | 0 | 69 | 7 | 76 | 30.4 |
| Left | 6 | 43 | 7 | 56 | 22.4 |
| Bilateral | 2 | 91 | 11 | 104 | 41.6 |
| Total | 11 | 214 | 25 | 250 | 100 |

**Table 5 Distribution of Vertebral Injury**

| Site of fracture | Vertebral body fracture | Fracture between two vertebral | Multiple fracture | Total | % |
|---|---|---|---|---|---|
| $T_3$ | 1 | 0 | 0 | 1 | 0.4 |
| $T_5$ | 3 | 0 | 0 | 3 | 1.2 |
| $T_{10}$ | 1 | 0 | 0 | 1 | .4 |

***Cont...*** **Table 5 Distribution of Vertebral Injury**

| | | | | | |
|---|---|---|---|---|---|
| $T_{12}$ | 3 | 0 | 0 | 3 | 1.2 |
| $T_2/T_3$ | 0 | 5 | 0 | 5 | 2 |
| $T_8/T_9$ | 0 | 4 | 0 | 4 | 1.6 |
| Others | 0 | 15 | 0 | 15 | 6.0 |
| Multiple fracture | 0 | 0 | 2 | 2 | 0.8 |
| No Injury | 0 | 0 | 0 | 216 | 86.4 |
| Total | 8 | 24 | 2 | 250 | 100 |

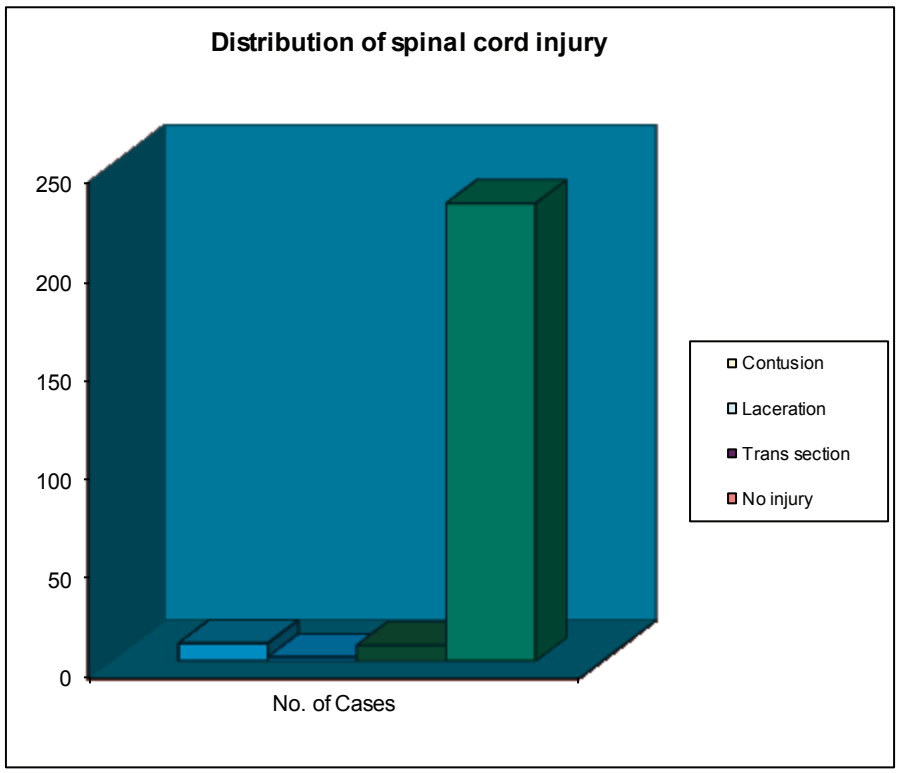


**Figure 1 Distribution of spinal cord injury**

## Discussion

Motor vehicle accidents and fall from height account for 28.9% each of all sternal fractures in our studies. Ribs were the most commonly traumatized bone and injury to it was seen in 236 cases (94.4%) and our findings are in near agreement with the previous observation by Sudeshini (90.5%)[21]. It was found that direct violence caused rib fractures in majority of cases (203;81.2%) and blunt indirect violence caused injuries to ribs in 25 (10%) and penetrating injuries in 8 (3.2%).

Out of 130 cases of traffic accidents, 125 were reported with rib injury. In short, 96.14% of traffic incidences caused rib fractures as observed by Geetha (2001) who reported 96.1% rib fractures. 47 cases of fall from height were reported and 46 (97.87%) showed rib fractures (Sudeshini; 98 .05%)[14].

Of the 10 cases of stab injury, 7 (70%) were reported with rib fractures. Among 27 cases of railway occurrence, 26(96.3%) showed with rib fractures. All 3 cases with the history of fall from boat showed rib injury (100%).

All 3 cases with the history of CPR showed rib injury. Of 250 cases, 129 (51.6%) showed simple fractures at the right side and 105 (42%), on the left side. Multiple rib fractures were observed in 33 cases (13.2%) on the right side and 36 (14.4%) on the left. Combination of simple and multiple fractures were reported in 16 cases (6.4%) on the right side and 10 (4%) on the left. Among the penetrating injuries a cut on the rib on right side occurred in a single case and a similar injury on the left side occurred in 7 cases.

The common sites of fractures situated anteriorly, on the right side 33 cases (13.2%), left side 21 cases (8.4%) posteriorly on the right side with 32 cases (12.8%) and 26 cases (10.4%) on the left side, These prevalence of occurrence of rib fractures could be due to the higher incidence of traffic accidents with pedestrian involvement (50.7%). Rib fractures occurred on the outer aspects in 18 cases (7.2%) on the right side and 16 (6.4%) on the left, in agreement with Guharaj[5].

First rib was injured in 64 cases on right side and in 51 on left side. 11$^{th}$ and 12$^{th}$ ribs involved in 27 cases on right side and 19 cases on left side, the lower occurrence due to high mobility and yielding nature of the floating ribs[12,24]. Majority of rib fractures occurred through 3$^{rd}$ to 10$^{th}$ ribs, in 166 (66.4%) on right and 159 on left side (63.6%), which is in agreement with Tedeschi[12].

34 cases (13.6%) with vertebral injuries were observed and 19 were associated with spinal cord injury, contusion observed in 9 cases (3.6%) and transection in 8 cases (3.2%). The most common level of fracture of thoracic spinal column was between 2$^{nd}$ and 3$^{rd}$ vertebrae (2 %). Multiple fracture sites were obtained in 2 cases (0.8 %). In a previous investigation P. Rema (1988) reported commonest sites of injury as 3$^{rd}$ and 12$^{th}$ vertebrae with equal frequency[23].

## Conclusions

1. External injuries were not found in 67 cases (26.8%). Subcutaneous emphysema was noted in 14 cases (5.6%),13 due to blunt injury and 1 due to penetrating injury.
2. One case (0.4 %) was reported with external injuries without any internal thoracic injury. Involvement of rib alone constituted 93 cases (37.2 %) followed by combination of rib and lung 54 (21.6 %), rib and sternum 13 (5.2%), sternum and lung 12 (4.8 %) & combination of various other organs occurred in 67 (26.8%).
3. Motor vehicle accidents and fall from heights account for 28.9% each of all sternal fractures.
4. Rib fractures were due to direct violence in majority of cases (203 cases; 81.2%) and blunt indirect violence in 25 cases (10%) and penetrating injury in 8 cases (3.2%).
5. Simple fractures were the common rib injury in both sides (51.6% in right and 42% in left side respectively).
6. 34 cases (13.6%) with vertebral injuries were recorded and most common level of fracture of thoracic spine was between 2$^{nd}$ and 3$^{rd}$ vertebrae (2.0 %).

**Conflict of Interest:** Nil.

**Source of Funding:** Self.

**Ethical Clearance:** Institutional ethics committee clearance obtained.

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*Original research paper*

# Evaluation of the Cookies Formulated with *Costus igneus* Plant Material for Antidiabetic Activity

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## Abstract

Diabetes Mellitus is a fast-growing disorder in the current scenario commonly affecting all age groups especially elder groups. The high blood glucose can be kept in control with nutraceutical foods. The present study is aimed to formulate a nutritionally rich cookie with *Costus igneus* leaf extract and to determine the effect of cookie consumption on decreasing blood glucose levels in type 2 diabetic patients. Cookies made with *Costus igneus* leaf powder etc. were analyzed for proximate analysis and phytochemical analysis with standard procedures. A total of 30 Type-II diabetic patients were selected for the study whose demographic variables and blood glucose levels were measured on the first day and after 15 days, 30 days of cookies consumption. The proximate and physic-chemical analysis showed cookies contain high amount of secondary metabolites including antioxidant compounds. Among the 30 study subjects, the mean levels of FBS and PBS were decreased significantly in all the four groups from day 0 to day 30 which indicates that *C.igneus* cookies consumption had good effect in reducing the blood glucose levels. However the HbA1C has been decreased by one unit in all the four study groups. The cookies made with *Costus igneus* plant material have good antimicrobial, antioxidant and antidiabetic activities and can be used as a therapeutic and functional food source for the treatment of overweight, obesity and diabetes.

***Key words:*** *Costus igneus, cookie, proximate analysis, phytochemicals, antioxidant, post prandial, glycated hemoglobin.*

## Introduction

The incidences of deficiency diseases are on decline phase due to the incorporation of fortified foods into our diet. However, the prevalence of obesity, diabetes mellitus (DM) and cancer are escalating due to food and lifestyle changes. Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia (high level of sugar in the blood for a prolonged period), resulting from defects in insulin secretion, or insulin action or both. Nutritional management plays a key role in managing diabetes. Foods with a lower glycemic index (GI) scores are ideal for helping to keep blood sugar levels stable. Several studies have reported that the consumption of fiber-rich and low-GI foods like oats, ragi, soya, bajra, almonds, flax seeds, etc. will help to keep blood sugar level stable and also significantly decrease in total cholesterol, LDL-cholesterol, and triglyceride levels. Antioxidants like polyphenols and ascorbic acid are vital substances which possess the ability to protect the body from damage caused by free radical-induced oxidative stress. [1-5] The use of antioxidants from food sources is an active area of study in diabetes research.

*Costus igneus* is an herbaceous plant, its alternative names include insulin plant, spiral flag or fiery *Costus*. It belongs to the *Costaceae* family. It is widely grown and

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used in South India, to treat diabetes due to its antidiabetic property. The various ethanolic and methanolic extracts of *C. igneus* have been reported for many pharmacological activities such as antidiabetic in controlling the blood glucose levels, antibacterial, antifungal, antioxidant, hypolipidemic, hepatoprotective, anti-inflammatory, antiproliferative and many more and these properties are due to presence of secondary metabolites such as alkaloids, quercetin, diosgenin, steroids, beta-carotene, flavonoids, terpenoids and phenolic compounds in the leaf extracts. [6-8] Most of the individuals living in both urban and rural areas of Visakhapatnam who were suffering with type 2 diabetes practicing of consuming 1-2 leaves of *C.igneus* per day daily in their diet. Hence the present study is intended to develop a nutritional rich cookie formulated with *C. igneus* leaf powder and to determine the effect of consuming *Costus igneus* cookies on decreasing blood glucose levels in type 2 diabetic patients.

## Materials and Method

**Collection of plant extract:** *Costus igneus* plant leaves were collected from Ambasamudram, Tirunelveli, Tamil Nadu, India. Fresh leaves of *Costus igneus* were collected, cleaned and shade dried. The dried leaf was made into powder using a mechanical grinder. The powdered samples were extracted with methanol using a Soxhlet apparatus.

**Preparation of cookie:** In the present study the following raw materials were used to prepare cookies which include *C. igneus* leaf powder, multigrain flour (oatmeal, ragi, bajra, soya, wheat flour), almonds, flax seeds, maida, butter, vegetable oil, milk, sweetener. Insulin plant leaves were shade dried, grinded and sieved into a fine powder. Oatmeal, ragi, bajra, soya were roasted and grinded into fine flour. A known amount of dry mix was prepared by mixing multigrain flour and insulin plant leaf powder in a vessel. Wet mix was prepared in a separate vessel by mixing a known amount of vegetable oil and melted butter. Salt, sweetener, baking powder, and a drop of vanilla essence for the flavor were added to the wet mix. Prepared dry mix was added slowly to the wet mix and mixed well to make the dough. The dough was kneaded well and made into shapes. The shaped dough was baked at 180°C. Cookies were packed into airtight cover and stored in the cool and dry place.

**Figure 1: Cookie prepared with *Costus igneus* leaf powder**

**Proximate analysis:** In proximate analysis total moisture, total solids, total ash, water-soluble ash, acid-insoluble ash, sulphated ash and fat content of *Costus igneus* cookie were analysed with standard procedures [9-11]. Moisture content and solid content of the sample were analyzed in moisture analyzer MB45. Estimation of protein was carried out by standard Lowry's method (1951).[12] Total Carbohydrate content was estimated by modified anthrone method (Hedge and Hofreiter, 1962). The total reducing sugar content of *Costus igneus* cookie was evaluated with 3,5-dinitrosalicylic acid (DNS) method. [13] α-Amylase inhibitory activity of the extract and fractions was carried out according to the standard method with few modifications.[14]

**Phytochemical analysis:** In the present study, several phytochemical constituents were evaluated qualitatively using standard protocols [15-17].

**Antioxidant activity:**

**Estimation of Ascorbic Acid:** Ascorbic acid estimation was carried by the volumetric method described by Pisoschi et al. (2008) [18]. Amount of ascorbic acid present is calculated by below formula

$$\text{Ascorbic acid} = \frac{0.5}{V1} \times \frac{V2}{5} \times \frac{100}{wt.of\ the\ sample} \times 100$$

**Determination of β-carotene:** Estimation of beta-carotene in cookie sample was performed according to Mustapha and Babura (2009). The following formula was used to calculate

$$\beta\text{-carotene } (\mu g/100gm) = \frac{OD\ at\ 452nm \times 13.9 \times 104 \times 100}{Wt.of\ sample \times 560 \times 1000}$$

**Total Phenolic Content (TPC):** The total phenolic content (TPC) of *Costus igneus* cookie sample

was determined by Folin-ciocalteu method.[19] TPC quantification and results were expressed as mg/g (Gallic Acid Equivalent (GAE)/ dry weight).

**DPPH radical scavenging assay:** The radical scavenging activity of cookie sample was determined by 1, 1-diphenyl-2-picrylhydrazyl (DPPH) using the method described by Shimada et al. (1992). The percentage inhibition was calculated by the following equation.

$$\% \text{ radical scavenging activity} = \frac{(absorbance\ of\ blank - absorbance\ of\ sample)}{(absorbance\ of\ blank) \times 100}$$

**Evaluation of cookies for controlling the blood glucose levels in Type-II diabetic patients:** The study was a randomized clinical trial done to evaluate the effect of consuming *C.igneus* cookies on decreasing the blood glucose levels in 30 Type-II diabetic patients. From the 30 subjects, blood samples were collected and sent for analysis of FBS, PBS and HbA1C using C111 Cobas analyzer. The inclusion criteria of the study were Age > 35 years, non-pregnancy, non-allergic to herbal products, not taking any herbal products during the study, no acute infection, HbA1C > 7, FBS > 140 mg/dl, PBS > 200 mg/dl and non-insulin dependent. *C.igneus* cookies were prepared in a way that each cookie weighs 20 g and each contains 500mg of *C.igneus* plant extract. After explaining the main objective of the study, study protocol and importance of consuming *C.igneus* cookies in controlling the diabetes, a written consent form was taken from each individual. Each subject was instructed to consume a single cookie after half-an-hour of breakfast, lunch and dinner along with their routine regular diabetic drugs for 15 days initially. After 15 days, FBS, PBS and HbA1C tests were performed. Again they were instructed to take the same quantity of cookies at three different time intervals in a day for another 15 days and their blood glucose levels were again monitored. Data was analyzed using SPSS Version 24.0. Results were expressed as Mean ±SD of three replicates determinations.

## Results and Discussion

Proximate analysis is an important index to classify the nutritional value of a food material. The proximate compositions determined in the cookie samples were summarized in Table 1. It shows that the cookie sample has a moisture content (7.94 ± 0.2), total ash (70.7 ± 0.1), high protein content (4.24 ± 0.4), high fiber (8.03 ± 0.007) content; and a relatively lower fat content (3.75 ± 0.3). This indicates that *C. igneus* cookies are good source of mineral elements as they contained a high percentage of ash. The presence of high protein content in cookie promotes body development, growth control, maintenance of fluid balance, strong immune function etc. As the fibre content of the cookie was high which may helpful for the better digestion process. It was found that, the total carbohydrate content of the cookie sample was high (80.2 ± 1.1) which are major contributors of energy. From the present study, it has been shown that cookies made with *Costus igneus* plant leaf have less reducing sugar (0.07 µg/ml) when compared with standard (1.05µg/ml). The results of the present study on in-vitro anti-diabetic activity of *Costus igneus* cookie are shown in Figure 2. Cookies made with *Costus igneus* have good α-amylase inhibitory activity at 500 µg/ml. The present study had proved that cookies made with *Costus igneus* leaf had shown good anti-diabetic property which can better control the blood glucose levels in diabetic patients because α- amylase inhibitors also called as starch blockers tend to prevent or slow down the absorption of starch into the body mainly by blocking the hydrolysis of 1,4-glycosidic linkages of starch and other oligosaccharides into maltose and other simple sugars.

*Costus igneus* cookie was subjected to preliminary phytochemical analysis and the results showed the presence of phytochemicals which include flavonoids, alkaloids, terpenoids, tannins, steroids, quinones, polyphenols, phenols, saponins, glycosides and coumarins and this in turn indicates it have good antibacterial, anti-inflammatory, anticancer, and antidiabetic activities and cardiac failures. The results obtained with *Costus igneus* cookie revealed the ascorbic acid content as 4.2µg/g hence act as a powerful antioxidant which fights against free-radical induced diseases. β-carotene was estimated, and the results showed that *Costus igneus* cookies have high β-carotene content 1.49µg/g and vitamin content 2.48µg/g. The results showed that the total phenolic content of cookie was 5.44 mg of GAE/g of dry sample. As the cookie showed higher phenolic content, it is likely to be a potential antioxidant. DPPH radical scavenging activity of cookie was showed in Table 2. Cookie at 10 µg/ml showed the lowest inhibition with 9.92%. The $IC_{50}$ value for DPPH, the *Costus igneus* cookie shows

maximum antioxidant activity with 62.3% (Table 3).

All the 30 subjects fasting serum blood glucose levels, post-prandial serum blood glucose levels, HbA1C levels before and after intervention were showed in the Table 4. The mean levels of FBS and PBS were decreased significantly in all the four groups from day 0 to day 30 which indicates *C.igneus* cookies consumption had good effect in reducing the blood glucose levels. However the HbA1C has been decreased by one unit in all the four study groups. Akhila et al. (2010) found that leaves of *Costus igneus* reduced the fasting and postprandial blood sugar levels, bringing them towards normal, in dexamethasone-induced hyperglycemia in rats [20]. The study was mainly designed and investigated based on the consumption of *C.igneus* leaves by the local inhabitants of Visakhapatnam to control their blood glucose levels by both type I and type II diabetic patients. The *Costus igneus* plant was cultivated in their own houses and daily they were consuming 1-2 leaves per day. However further research has to be carried out to know the effect of *C.igneus* cookies in Type-I diabetic patients.

**Table 1: Proximate analysis of *C. igneus* cookies**

| **Parameter** | **Percentage dry weight basis** | **Mean** | **SD** | **SEM** |
|---|---|---|---|---|
| Moisture (%) | 7.94± 0.2 | 8.27 | 0.56 | 0.37 |
| Solids (%) | 92.06±0.5 | 92.05 | 0.05 | 0.03 |
| Regain (%) | -8.63±-1.0 | -8.61 | 0.9 | 0.56 |
| Total ash (%) | 70.7±0.1 | 70.7 | 0.01 | 0.05 |
| Water-soluble ash (%) | 43.65±0.8 | 43.6 | 0.08 | 0.04 |
| Acid-insoluble ash (%) | 82.35±0.6 | 82.3 | 0.06 | 0.03 |
| Sulphated ash (%) | 80.47±1.1 | 80.3 | 1.24 | 0.72 |
| Fat (%) | 3.75±0.3 | 3.75 | 0.05 | 0.028 |
| Fiber (%) | 8.03 ± 0.007 | 8.01 | 0.01 | 0.001 |
| Protein (%) | 3.24 ± 0.4 | 3.24 | 0.05 | 0.029 |
| Total carbohydrate content (%) | 80.2 ± 1.1 | 80.06 | 1.006 | 0.58 |
| 'p' ≤ 0.05 Significant | | | | |

Values are expressed as mean ± SD of the three replicates. SD: Standard deviation, SEM: Standard error of means

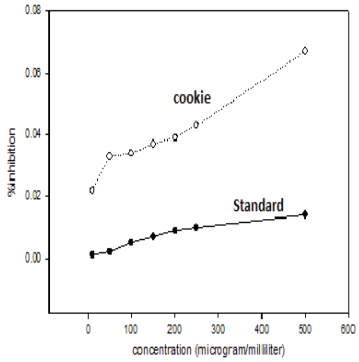


**Figure 2: α–Amylase inhibitory assay of *Costus igneus* leaf and Cookie**

**Table 2: DPPH radical scavenging assay of *Costus igneus* cookie**

| Concentration (µg/ml) | IC50 Values (%) |
|---|---|
| 10 | 9.92 |
| 20 | 11.25 |
| 30 | 12.37 |
| 40 | 13.19 |
| 50 | 14.52 |
| 100 | 18.81 |
| 500 | 62.3 |

**Table 3: Antioxidant activity of *C.igneus* cookie**

| Ascorbic acid content (µg/g) | β-carotene content (µg/g) | Total phenolic content (mg/g) | DPPH activity (%) | 'p' Value |
|---|---|---|---|---|
| 4.2±1.3 | 1.49±0.1 | 5.44±0.7 | 62.3±1.9 | 0.9371 |

'p' value: Probability value

**Table 4: Effect of cookies in controlling blood glucose levels in Type-II diabetic patients**

| S.No | Age (years) | Fasting serum glucose levels (Mean ± SD) (mg/dl) | | | Post prandial serum glucose levels (Mean ± SD (mg/dl) | | | HbA1C levels (Mean ± SD) (%) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Day 0 | Day 15 | Day 30 | Day 0 | Day 15 | Day 30 | Day 0 | Day 15 | Day 30 |
| 1. | 35-40 | 185±3 | 141±4 | 123±9 | 199±1 | 168±7 | 151±4 | 8.9±0.2 | 8.2±0.4 | 7.9±0.3 |
| 2. | 41-45 | 178±2 | 154±5 | 131±5 | 215±5 | 180±6 | 148±5 | 8.7±0.6 | 8.5± | 7.8±0.1 |
| 3. | 46-50 | 163±8 | 138±2 | 110±4 | 238±6 | 189±3 | 159±3 | 8.3±0.3 | 7.8±0.1 | 7.6±0.2 |
| 4 | 51-55 | 184±6 | 159±2 | 125±3 | 256±4 | 197±8 | 163±4 | 9.1±0.2 | 8.9±0.1 | 8.4±0.3 |

## Conclusion

Due to high antioxidant potential and phenolic content of the *Costus igneus* cookie, it can be used as a therapeutic or functional food source for the treatment of overweight, obesity and diabetes. The study also concluded that, regular consumption of *Costus igneus* cookies reduced serum glucose levels and glycated hemoglobin levels in people with type 2 diabetes.

**Conflict of Interest:** Conflict of interest declared none.

**Source of Funding:** The work was not supported by any grants and funds

**Ethical Clearance:** This study was reviewed and approved by The Ethics Committee of GITAM Institute of Medical sciences and Research, Tertiary care hospital, GITAM (Deemed to be University)

**Conflict of Interest:** The study declared "No conflict of interest"

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Research Article

# A Study to Assess the Effectiveness of Training Program on Knowledge and Practices Regarding Advanced Cardiovascular Life Support (ACLS) among Staff Nurses in MMIMS & R Hospital

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## Abstract

Advance cardiovascular life support is a level of medical care which is used for clients with life threatening illness. Death can occur at any time due to causes like stroke, poisoning, accidents, suicide, injury, medication error, shock and cardiac arrest. Among these, cardiac arrest deaths remain major cause of mortality. Therefore, one of the measures to improve survival is by introducing the concept of "chain of survival". The elements of the chain of survival include recognition of early warning signs, activation of the emergency medical system, basic cardiopulmonary resuscitation, defibrillation, intubation and intravenous delivery of medications. Advance cardiac life support (ACLS) refers to a set of clinical interventions for the urgent treatment of cardiac arrest and other life threatening medical emergencies. Extensive medical knowledge and rigorous hands-on training and practice are required to master ACLS. Only qualified health care providers, physicians, paramedics, nurses, respiratory therapists, pharmacists, and other specially trained health care providers can provide ACLS, as it requires the ability to manage the patient's airway, initiate IV access, read and interpret electrocardiograms, and understand emergency pharmacology. Therefore, training program on ACLS is required for staff nurses, to gain knowledge and improve skill. Quantitative approach was selected with pre-test - post-test only design. 36 samples were chosen (working in ICU/ ICCU/ emergency/ medical wards / surgical wards) using random sampling technique. Training program was given to the study subjects and a structured questionnaire and structured checklist was used to collect data regarding Advanced cardiovascular life support of subjects before and after the administration of training program. Findings revealed that the mean post-test sore was greater than the mean pre-test score. Thus it is concluded that the training program on Advanced cardiovascular life support was effective for teaching and improving staff nurse's knowledge and practices.

***Key words:*** *Training, ACLS, staff nurses*

## Introduction

Death can occur at any time due to causes like stroke, poisoning, accidents, suicide, injury, medication error, shock and cardiac arrest. Among these, cardiac arrest deaths remain major cause of mortality[1]. As per World Health Organization (WHO) census, statistics mortality due to cardiac causes has overtaken mortality due to all cancers put together. Approximately, 4280 out of every one lakh people die every year from cardiac arrest in India alone[2]. The survival rate of intra-hospital post-cardiac arrest patients, related to the identification of cardiac arrest and care performance by nurses trained in Advance Cardiac Life Support (ACLS), and by untrained nurses. Therefore, one of the measures to improve survival is by introducing the concept of "chain of survival" and Only qualified health care. physicians, paramedics, nurses, respiratory therapists, pharmacists, and other specially trained health care providers can provide ACLS, as it requires the ability to manage the Defibrillation is by far the most effective treatment among the components recommended in the American Heart Association(AHA) Advance Cardiovascular Life Support (ACLS) guidelines[3].

**Objectives**

**1**. To assess and compare knowledge practice regarding ACLS before and after administration of training program.

**2.** To assess and compare practices of staff nurses regarding ACLS before and after administration of training program.

**3.** To determine the relationship between knowledge and practice of staff nurses regarding ACLS.

**4.** To determine the association of knowledge and practice of staff nurses regarding ACLS with selected variables.

## Material and Method

Quasi-experimental One group pre-test post-test design. The design can be represented as[4]:

OK1P1 X OK2P2X1OK3 P 3X1 OP4OK 4P5.

$\mathbf{O_{K1P1}}$= denotes the assessment of knowledge and practice regarding ACLS before implementation of ACLS training program

**X** = ACLS training program

$\mathbf{O_{K2P2}}$ = denotes the first posttest Knowledge and practice of staff nurses regarding ACLS after implementation of ACLS training program

$\mathbf{X_1}$= Individualized feedback on ACLS for identified knowledge and practice deficit areas

$\mathbf{O_{K3P3}}$= denotes the second posttest of knowledge and practice of staff nurses regarding ACLS

$\mathbf{O_{P4}}$= denotes the third posttest of practice of staff nurses regarding ACLS

$\mathbf{O_{K4P5}}$= denotes the assessment of posttest knowledge and practice of staff nurses regarding ACLS

**VARIABLES UNDER STUDY : Independent variable**: Advance Cardiovascular Life Support training program.**Dependent variable**: Knowledge and practice of staff nurses regarding ACLS.

**SETTING** : The present study was conducted at **Maharishi Markandeshwer Institute of Medical Science and Research Hospital**, Mullana, which is 950 bedded multi-specialty hospital situated in the campus of Maharishi Markandeshwer University, Mullana, Ambala. The data was collected from staff nurses working in ICU, CCU, emergency, Medical ward and surgical wards.

**SAMPLING:** The sampling technique used was random sampling technique.

**SAMPLE SIZE**: The sample size for the present study was 36.

**DESCRIPTION OF TOOLS:**

A structured knowledge questionnaire, and observational checklist were used for the data collection in the study. The structured knowledge questionnaire was divided into two parts as under:

**SECTION I**– consists of 6 questions related to the background data of eligible students.

**SECTION II**- consists of 40 knowledge items

Covering the following areas:

Concept of ACLS, Components of ACLS & its techniques, Rhythm of ACLS, Medication.

The structured practice checklist consists of 60 practice items based on the content on Advance cardiovascular life support.

## Major Findings

1. The mean 4$^{th}$post-test knowledge score (36.36) was significantly (F=322.8, P≤ 0.01) higher than the mean pre-test knowledge score (18.08).

2. The mean 5$^{th}$post-test practice score (52.33) was significantly (F=1073.9, P≤ 0.01) higher than the mean pre-test practice score (12.97).

3. There was no correlation between post knowledge with post practice of staff nurses regarding ACLS (r=0.053, p>0.05).

4. The knowledge and practice of staff nurses regarding ACLS was not significantly (p≤0.05) associated with selected variables.

**CONCLUSION DRAWN FROM THE STUDY:**

The mean posttest knowledge score in all areas of knowledge questionnaire was significantly higher than pretest knowledge score.

The mean posttest practice score in all the areas of practice was significantly higher than the mean pretest practice score.

## Discussion

In the present study the 3rdpost intervention of knowledge score 36.3±3.09 and 4th post intervention of practice score 52.3±2.51with mean difference of 18 in knowledge score and 39.26 in practice score. The computed t value was found to be significant (t=31.0, p=0.00) and (t=26.6, p=0.00) at 0.05 level of significance. Similarly, in a study is conducted by **Amal Saied Taha Refaey** reported that on the second post-test the knowledge score 36.6±3.97 and practice score 2.25±18.7. The difference between mean knowledge and practice score was found to be statistically significant

**Implications**

**1. Nursing Education**

— Student nurses should be educated about Advance Cardiovascular Life Support.

— In service education should be planned for the nurses to upgrade their knowledge and practice regarding ACLS

— Induction program should be organized by continuous nursing education cell of an institution for the staff nurses regarding evidenced based procedure.

— Educational aids should be developed regarding ACLS

**2. Nursing Administration**

· Nurse administrator should organize various in-service education/ program /workshop to update the knowledge and practice of nursing employees on Advance Cardiovascular life supported.

· Nurse administrator should employ and encourage the use of new and creative teaching strategies utilizing the latest technologies directed towards the goal of enhancing the knowledge and practice of staff nurses regarding ACLS.

· Nursing administrator should appoint a nurse responsible for training regarding ACLS.

3. Nursing Practice

— Nurses play a vital role in providing care to the patient, so it is imperative for nurses to provide ACLS.

— Nurse educator should use a standardized, valid and reliable structured knowledge questionnaire and observation checklist to assess the knowledge and practice among staff nurses.

— Nurse educator should assess baseline knowledge and practice of staff nurses regarding ACLS.

— Nurses should follow the proper guidelines and technique for Advance Cardiovascular life support.

— Nurses should re-evaluate the level of knowledge and practice after implementation of training program to determine the practice.

**Recommendations**

· The study can be replicated on a larger sample of staff nurses in different setting for making broad generalization.

· A true experimental study can be conducted with training program regarding ACLS

· A study can be conducted to assess the knowledge and attitude among staff nurses regarding ACLS.

· A descriptive study to assess the knowledge and practice of staff nurses regarding ACLS.

· Various teaching strategies like demonstration, video teaching regarding ACLS can be developed.

**Conflict of Interest:** No

**Source of Funding:** Self

**Ethical Clearnce:** Ethical approval to conduct the study was obtained from the institutional Ethical Committee of M.M University, Mullana, Ambala, Haryana.

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# Punjabi Adaptation of WHO's Global Physical Activity Questionnaire (GPAQ) in Gurumukhi Script: A Validity and Reliability Study

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## Abstract

**Background:** WHO's Global Physical Activity Questionnaire (GPAQ) has not yet been adapted in the Punjabi language. This study was aimed to adapt the GPAQ into the Punjabi language in Gurumukhi script and to make it useful for physical activity surveillance on Punjabi population.

**Methods**: We translated the GPAQ-English into Punjabi language (Gurumukhi script) using the forward-backward translation technique. A total of 81 adult participants including staff and students having good command over Punjabi and English languages were conveniently recruited from Guru Nanak Dev University, Amritsar, Punjab, India. The validity of the adapted version was tested against the original English version of GPAQ by applying Spearman's rho. Test-retest reliability was tested by employing ICC coefficients.

**Results:** GPAQ-P demonstrated good validity for total PA ($r_s$ = 0.877), work domain ($r_s$ = 0.815), transport domain ($r_s$ = 0.876), and moderate intensity PA ($r_s$= 0.860); moderate validity for recreation domain ($r_s$ = 0.643) and sitting time ($r_s$ = 0.629); and low for vigorous intensity PA ($r_s$ = 0.466). Moderate to excellent reliability was detected between two administration of GPAQ-P, excellent intraclass coefficients for total PA (ICC = 0.918), work domain (ICC = 0.943), transport domain (ICC = 0.968), recreation domain (ICC = 0.952), and moderate intensity (ICC = 0.956); good ICC for vigorous intensity (ICC = 0.845) and moderate ICC for sitting time (ICC = 0.704).

**Conclusions:** Punjabi adaptation of GPAQ in Gurumukhi script has good validity and reliability and it can be used for physical activity surveillance in Punjabi knowing population.

***Keywords:*** *Punjabi, GPAQ, validity, reliability, Physical activity, questionnaire, WHO*

## Introduction

The research area of Physical activity epidemiology in the Indian context is still barren. A very few studies have been accomplished concerning prevalence, patters and associated factors of physical activity in the Indian settings.[1, 2] Physical activity can be assessed among the populations using two approaches such as objective methods through the use of Accelerometers, Pedometers, Doubly labeled water and heart rate monitors.[3] The disadvantages associated with these methods are that these are relatively expensive and have less administration feasibility on larger populations.[4] Alternatively, self-reporting approach is the most feasible methods to assess the physical activity levels in larger populations.[5, 6] But low validity and reliability of the questionnaire is the major limitation of this approach. Global Physical Activity Questionnaire is one of the widely used instrument for assessing the physical activity levels in epidemiological studies.[7, 8] It has been recommended by the WHO for its STEPwise Approach to Non-communicable Disease Risk Factor Surveillance

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(STEPS).[7] Studies using GPAQ on Punjabi population are scarce.[2] To the author's best knowledge, no Punjabi (Gurumukhi Script) adaptation of the GPAQ is available yet. Gurumukhi and Shahmukhi (Perso-Arabic) are two different scripts in which Punjabi is written. Gurumukhi script is used in Indian Punjab while Shahmukhi (Perso-Arabic) script is used in Pakistani Punjab.[9] We have translated and adapted GPAQ into Gurumukhi script of Punjabi. The objective of this study was to establish the reliability and validity of the Punjabi version (Gurumukhi script) of WHO's Global Physical Activity Questionnaire.

## Material and Method

### Sample

As referred in previous studies, the ratio of 5 subjects per item was considered to finalize the sample. As GPAQ has a total of 16 items, it was assumed that a minimum 80 participants would be required for the study.[10, 11] Hence, by using the convenience sampling technique, a sample of 81 participants of age 18 to 64 years were recruited from Guru Nanak Dev University, Amritsar, Punjab, India. The sample consisted of 43 male and 39 females. Only those participants were included who can speak, read and write both Punjabi and English languages proficiently.

### Protocol

Based on the methods adopted by previous similar studies,[12, 13] the original English version of Global Physical Activity Questionnaire (GPAQ-English) was translated into the Punjabi language into 'Gurumukhi' script by the research team and then evaluated and back translated by three bilingual experts. Their disagreements were further discussed and a final consensus was made. Some more examples were inserted relevant to the local conditions to make the statements more intelligible to the respondents. Some terms of which no Punjabi version was available, were written in their original form in the Gurumukhi script. However, due consideration was given to maintain the actual concept of the statements. A pilot testing was done on a small sample of 20 subjects to elude any confusion or ambiguity in any of 16 items of the newly translated questionnaire.

### Data collection

The original version and translated version of the GPAQ were distributed to the participants to fill in on day one and were instructed to continue their normal routine for a week ahead. On day eight, participants were again approached and asked to fill the same Punjabi version of GPAQ.

### Scoring

Ainsworth's compendium of physical activity was used to assign the MET values to particular physical activities.[14] For the estimation of energy cost, a value of 4 METs to moderate intensity activities and 8 METs was assigned to vigorous intensity activities. The METs min/week were computed using the following equation:

*Minutes of activity/day X 7 days X MET level*

### Data Analyses

Descriptive statistics of MET scores derived from questionnaires were presented as mean, standard deviation and median. The concurrent validity of the GPAQ Punjabi version (filled on day 1) against the GPAQ English version was examined using Spearman's coefficient of correlation. Following the guidelines by Koo et al.[15] on the selection of test-retest reliability analysis method, Intra-class correlation (ICC) with 95% confidence intervals was computed between the scores of first and second administrations of GPAQ-P. The results were considered significant at the 0.05 alpha level.

## Findings

**Table 1: Descriptive figures of MET scores and sitting hours measured by GPAQ original and GPAQ-P on first and second administration**

| Variable | GPAQ (Original Version) | | | GPAQ-P (First administration) | | | GPAQ-P (Second administration) | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Median** | **Mean** | **SD** | **Median** | **Mean** | **SD** | **Median** |
| Work domain PA | 358.75 | 724.93 | 0 | 325.86 | 682.62 | 0 | 422.13 | 688.77 | 180 |
| Transport domain PA | 418.50 | 721.73 | 0 | 459.63 | 693.59 | 0 | 524.36 | 749.63 | 130 |
| Recreation domain PA | 168.25 | 449.98 | 0 | 360.25 | 602.51 | 0 | 423.88 | 364.38 | 170 |
| Moderate intensity PA | 868 | 1162.33 | 290 | 827.13 | 891.95 | 480 | 911.63 | 869.88 | 790 |
| Vigorous intensity PA | 85.75 | 301.53 | 0 | 300.36 | 498.86 | 0 | 446.13 | 545.68 | 300 |
| Total PA | 945.50 | 1126.61 | 400 | 1146.25 | 1077.52 | 970 | 1370.38 | 1116.36 | 1240 |
| Sitting time (hours/ day) | 8.53 | 2.82 | 8 | 8.03 | 2.99 | 8 | 8.40 | 2.75 | 8 |

*GPAQ = Global Physical Activity Questionnaire*

*GPAQ-P = Global Physical Activity Questionnaire–Punjabi*

*PA = Physical Activity*

*SD = Standard deviation*

**Table 2: Spearman's rho between original version of GPAQ and Punjabi (Gurumukhi script) version of GPAQ**

| GPAQ-P (MET-min/week) | Males (N=43) | | Females (N=39) | | Both genders (N=81) | |
|---|---|---|---|---|---|---|
| | $r_S$ | Sig. | $r_S$ | Sig. | $r_S$ | Sig. |
| Work domain PA | 0.751 | 0.001* | 0.861 | 0.001* | 0.815 | 0.001* |
| Transport domain PA | 0.893 | 0.001* | 0.853 | 0.001* | 0.876 | 0.001* |
| Recreation domain PA | 0.538 | 0.001* | 0.746 | 0.001* | 0.643 | 0.001* |
| Moderate intensity PA | 0.811 | 0.001* | 0.887 | 0.001* | 0.860 | 0.001* |
| Vigorous intensity PA | 0.500 | 0.001* | 0.444 | 0.001* | 0.466 | 0.001* |
| Total PA | 0.843 | 0.001* | 0.910 | 0.001* | 0.877 | 0.001* |
| Sitting time | 0.491 | 0.001* | 0.744 | 0.001* | 0.629 | 0.001* |

*$r_s$ = Spearman's correlation of coefficient*

*MET = Metabolic equivalent of task*

Table 2 demonstrates the results of concurrent validity of GPAQ-P against the original GPAQ. Spearman's correlation of coefficient was run to examine the correlation between MET scores of different domains, intensities and total PA alongwith sitting time hours/day. Analyses revealed good correlation in all categories and both genders ranging from .466 to .877 ($p<.05$). In a combined sample of both genders, maximum and minimum correlations were found in total PA ($r_s = .877$) and vigorous PA ($r_s = .466$) respectively. Meanwhile, high correlations were noticed in Moderate intensity PA ($r_s = .86$), Work domain PA ($r_s = .815$) and transport domain PA ($r_s = .876$) with original GPAQ scores. Low to moderate correlations were observed in vigorous intensity PA ($r_s = .466$) and recreation domain PA ($r_s = .629$). The correlation for sitting time was also acceptable ($r_s = .629$). In this case, scores of females depicted better correlation ($r_s = .744$) than males ($r_s = .491$) in sitting time.

**Table 3: Reliability of GPAQ-P based on ICC coefficients**

| GPAQ-P (MET-min/week) | ICC (95% Confidence intervals) | | |
|---|---|---|---|
| | Males | Females | Overall |
| Work domain PA | 0.917 (0.852-0.954) | 0.967 (0.939-0.983) | 0.943 (0.912-0.963) |
| Transport domain PA | 0.964 (0.934-980) | 0.979 (0.960-0.989) | 0.968 (0.968-0.951) |
| Recreation domain PA | 0.905 (0.832-.947) | 0.974 (0.952-0.987) | 0.952 (0.927-0.969) |
| Moderate intensity PA | 0.952 (0.913-0.974) | 0.962 (0.929-0.980) | 0.956 (0.932-0.971) |
| Vigorous intensity PA | 0.791 (0.648-0.881) | 0.902 (0.821-0.948) | 0.845 (0.77-0.898) |
| Total PA | 0.897 (0.819-0.943) | 0.944 (0.896-0.971) | 0.918 (0.875-0.946) |
| Sitting time | 0.59 (0.357-0.754) | 0.782 (0.621-0.936) | 0.704 (0.575-0.799) |

*ICC = Intra class correlation*

Table 3 shows the results of reliability analyses of scores of GPAQ-P. Significant intra class correlations were detected among all categories of GPAQ-P. Excellent correlations were observed for work domain PA (ICC = 0 .943, CI = 0.912 – 0.963), transport domain PA (ICC = 0.968, CI = 0.951 – 0.979), recreation domain PA (ICC = 0.952, CI = 0.927 – 0.969), moderate intensity PA (ICC = 0.956, CI = 0.932 – 0.971) and total PA scores (ICC = .918, CI = 0.875 – 0.946). A slightly less correlation was found for vigorous intensity PA (ICC = 0.845, CI = 0.77 – 0.898) but the correlation was still high though not excellent. Meanwhile, a moderate correlation was found for sitting hours (ICC = 0.704, CI = 0.575 – 0.799). Similar to validity analyses, females showed better reliability than males in each category.

## Discussion

The study was intended to develop a Punjabi version (Gurumukhi Script) of Global Physical Activity Questionnaire (GPAQ) which is an official instrument of WHO for physical activity surveillance in large population settings. The original version of GPAQ is in English language and Roman script.[7] GPAQ is also part of WHO's STEPwise approach to non-communicable disease risk factor surveillance.[7, 8] The current study has focused on the Punjabi language of northern India, in which GPAQ has not been translated yet. In this regard, taking into consideration the high need for Punjabi adaptation of GPAQ, a Punjabi translation of GPAQ was done by utilizing the protocol mentioned in the material and methods section. The results revealed significant validity and reliability of the Punjabi version of GPAQ. Excellent validity was observed in total PA scores, work domain, transport PA and moderate intensity scores except for vigorous intensity and recreation PA that showed low and moderate validity respectively. Furthermore, females showed higher correlations than males in terms of validity. Similar results were observed by Mumu et al.[8] while validating GPAQ in Bangladeshi population. Contrarily, another study on the French version of GPAQ demonstrated limited though acceptable validity and reliability.[12] In a comprehensive study in nine countries, GPAQ had shown poor validity and reliability.[16] In the same study, sitting time was poorly and insignificantly related to pedometer data. However, in our study, sitting time was also found to have acceptable validity and reliability in the overall sample. The reason for those poor results may be that they used the original English version of GPAQ in those populations whose native language is not English. The same study has recommended local adaptations of the instrument to make it more intelligible to the non-English speakers. Another study on the Brazilian population observed acceptable reliability but limited validity.[17] Our results showed high reliability in all PA domains and intensities whereas as reported by Bull et al.[16] work domain has shown higher reliability than recreation and transport domains in the reliability studies of Bangladeshi, Chinese, Ethiopian, Indonesian, South African, Japanese, and Taiwanese versions of GPAQ. A review of literature led by Matthews[18] reported that the GPAQ has similar validity and reliability to other physical activity questionnaires such as the IPAQ, Madras Diabetes Research Foundation-Physical Activity Questionnaire (MPAQ), Total Energy Expenditure Questionnaire (TEEQ), etc. In Punjabi context, International Physical Activity Questionnaire short form (IPAQ-SF) has been adapted in the Punjabi language by Shenoy et al.[13] They found Spearman's coefficient of 0.994, signifying excellent concurrent validity of IPAQ-SF Punjabi version. They found excellent validity for moderate and vigorous intensities. However, the major limitation of IPAQ-SF is that it does not measure domain-specific physical activity whereas GPAQ has the advantage of being short and producing domain-specific PA data. Although the adapted Punjabi version of GPAQ has shown good validity and reliability, refinement is still required to standardize it by using more rigorous methods.

### Limitations

At first, the sample size was small and subjects were not included from all age groups, socioeconomic statuses, and both urban and rural populations. Increased sample size may have produced more truthful results. Second, the validity was not tested against any objective measure such as accelerometers, pedometers or heart rate monitors which provide more accurate data on physical activity than self-report questionnaires. Third, recall bias may have its effects on the mindset of subjects.

### Suggestions for future research

This is the first attempt to adapt the WHO's GPAQ instrument in Punjabi for surveying physical activity in

larger populations. More studies of this kind with greater sample size are required to be carried out at local level to validate the adapted version.

More robust methods for establishing validity such as accelerometery, pedometery or heart rate monitoring may be used.

International Physical Activity Questionnaire long form (IPAQ-LF) is another widely used questionnaire for population surveys of PA. Concurrent validity of GPAQ-P against IPAQ-long form may be assessed in a further study.

Apart from Gurumukhi script, Punjabi is also being written in 'Shahmukhi' (Perso-Arabic) script in Pakistani Punjab, so a Punjabi translation in 'Shahmukhi' (Perso-Arabic) script is also required to be done.

## Conclusion

The Punjabi version of WHO's GPAQ in Gurumukhi script has acceptable validity and reliability and can be used for physical activity surveillance of Punjabi speaking population. It would be easy to understand for Punjabi speakers as it is enriched with local and simplified examples of work, transport and recreation domains, and PA intensities.

**Conflict of Interest:** No conflict of interests to declare.

**Source of Funding:** The study was funded by University Grants Commission (UGC) as Senior Research Fellowship for PhD study to the first author of this paper.

**Acknowledgement:** The authors would like to thank the translators for their scholarly input to the study and also would like to thank the participants for participating the study and their timely cooperation.

**Ethical Approval:** The study was approved by ethical committee of Faculty of Physical Education (T), Guru Nanak Dev University, Amritsar, Punjab, India.

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# Management of Oroantral Communication Using Double Layered Closure with Buccal Fat Pad and Buccal Advancement Flap: Prospective Randomized Clinical Study

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## Abstract

**Introduction:** Although many techniques are available for management of oroantral communication, they utilize single layer tissue for closure of defect which is composite in nature. There is limited evidence in literature regarding efficacy of double layered closure using combination of flaps. This study was designed to assess utility of double layer closure of oroantral communication using buccal fat pad and buccal mucosa advancement flap.

**Material and Method:** Patients with oroantral communication were randomly allocated to two groups; group A were treated with two layered closure (buccal fat pad and buccal mucosa) and group B were treated with single layer closure (buccal fat pad). Same protocol of perioperative management was used for both groups. The postoperative parameters evaluated included success of surgery (complete closure without any nasal regurgitation), duration of surgery, pain, swelling and mouth opening.

**Results:** Total of 27 patients were divided into group A (n=13) and group B (n=14). The mean size of the defect was 28.23 mm in study group and 24.57 mm in the control group. The surgical procedure took more time (42.23 minutes) in group A, as compared to group B (26.21 minutes). Post-operative evaluation of pain and mouth opening showed no statistically significant between the two groups at 7th and 30th postoperative days respectively. However, swelling was relatively more when combination of buccal fat pad and buccal advancement flap was used.

**Conclusion:** Double layered closure is efficient in management of OAC. No dehiscence of flap was seen in study group. Comparatively 3 dehiscence was observed in control group, especially with large size defect. The postoperative sequel in both groups was similar.

***Keywords:*** *oroantral fistula, combination flap, maxillary sinus, nasal regurgitation*

## Introduction

Oroantral Communication (OAC) is an unnatural communication between the oral cavity and maxillary sinus resulting from composite tissue loss involving the oral mucosa, alveolar bone and the sinus lining. It may occur subsequent to extraction of maxillary posterior teeth in close proximity to the sinus floor, during removal of cyst/ tumour in posterior maxilla or due to trauma or infection. Options available for management of OAC are variable and primarily depend on size of the defect. OAC which are 5 mm or smaller in diameter are most likely to close spontaneously without the need of any surgical intervention.[1] Larger communications may often persist, and require surgical closure of the defect. Various techniques have been suggested in literature for closure of OAC, which range from simple primary closure, to use of buccal advancement flap, palatal rotation flap, split thickness skin graft, allogenic graft, regional flap, distant flaps, bone grafts, or buccal fat pad. [2] The surgical option used depends on type and size of the defect and surgeon's choice.

The conventional methods for management of OAC attain closure using a single layer of tissue, which can be mucosa (palatal rotation flap, buccal advancement flap), muscle (tongue flap, temporalis flap), bone graft (autogenous or alloplast) or adipose tissue (buccal fat pad). The present study intended to evaluate the efficacy of double layer closure using combination of buccal fat pad & buccal advancement flap in management of OAC and compare it with the conventional single layer closure using buccal fat pad.

## Materials and Method

The study was initiated after due approval of ethical committee and patients were enrolled after acquiring written informed consent. The study design used was prospective double blind randomized clinical trial. Patients with clinically evident OAC, secondary to varying aetiology were included in the study. The exclusion criteria included history of recurrent sinusitis, pervious history of sinus surgery, immunocompromised patients, uncontrolled diabetes mellitus, history of radiation therapy, OAC subsequent to resection of malignancy and patients on long term steroid therapy. Patients were blindly allocated to group A (two layered closure with combination of buccal fat pad and buccal mucosa) or group B (single layer closure using buccal fat pad) using random allocation software (WINPEPI software version 11.65).

**Surgical Procedure:**

Patients in both groups were prescribed nasal decongestant (xylometazoline nasal spray), chlorhexidine oral rinse and antibiotic (amoxicillin 500 mg + clavulanic acid 125 mg BD), two days prior to the procedure, which was continued till 5th postoperative day. Choice of anaesthesia varied from local to general depending on case. The operator and the 1st assistant were kept same for all the cases. The size of the opening was measured in millimetres using graduated periodontal probe. Intra-operatively the lining of the OAC was freshened and the fistula tract was excised in case of long-standing communication. In group A, full thickness buccal mucoperiosteal flap was reflected, keeping the flap at least 0.5 cm anterior to the anterior margin of the defect. Periosteal scoring was done to mobilize the buccal flap for advancement over to the palatal side. Harvesting the buccal fat pad was done using blunt dissection, till adequate bulk of fat was mobilized at the surgical site (figure 1d). The harvested fat was sutured to the palatal mucosa using 3-0 polyglactin (vicryl, Ethicon, violet braided) suture. Additionally, when required holes were drilled at bone over buttress area to stabilize the buccal fat pad anteriorly (figure 1e). The buccal mucosal flap was then advanced and sutured over the palatal mucosa using 3-0 polyglactin suture to attain a double layered primary closure (figure 1f). Patients in group B received a single layer closure using buccal fat pad. Duration of the procedure was measured from the time of incision to placement of the last suture using digital stop watch.

Immediate postoperative care was kept same for both groups. Patients were advised to eat soft diet, avoid vigorous oral rinses and blowing of nose. Analgesic (diclofenac sodium 75 mg BD) was prescribed for 7 days to patients of both groups. The parameters evaluated included the primary outcome (successful closure of OAC) and secondary outcomes (postoperative pain, swelling and mouth opening). The parameters were measured by different investigator and the operators were blinded from the same. The success of the surgery was judged based on complete closure of the oroantral communication with lack of any nasal regurgitation at one week and 1 month after the surgery. Pain was evaluated on 1st and 7th postoperative days using visual analogue scale (VAS). Patients were verbally asked to rate intensity of pain on scale of 0 to 10, with 0 being no pain and 10 being unbearable pain. Swelling was assessed preoperatively and on 1st and 7th postoperative days using flexible measuring tape. The horizontal dimension of swelling was measured from lower attachment of ear lobe to commissure of the mouth, while the vertical dimension of swelling was measured from angle of mandible to the outer cantus of the eye. The facial swelling was calculated by multiplying the horizontal and vertical dimensions of swelling. Percentage of change in facial swelling was calculated using formula; [(postoperative value – preoperative value) ÷ preoperative value] × 100. Mouth opening was measured in millimetres as interincisal distance between central incisor teeth or between crest of alveolar ridge in edentulous patient on 7th postoperative day and at one month. The data collected was tabulated and analysed statistically.

## Results

Total of 27 patients, both males (n=16) and females (n=11) with clinical diagnosis of OAC and willing to participate in the study and follow-up were enrolled for the study. Patients were randomly allocated to group A (n=13) and group B (n=14). All the patients completed follow-up of 1 month and there was no dropout. The size of the defect varied from 11 to 40 mm with mean diameter of 28.23 mm in study group (A) as compared to 24.57 mm in the control group (B). The surgical procedure took more time in group A, with mean time of 42.23 minutes, as compared to 26.21 minutes in group B.

Postoperative pain was measured using VAS. The pain scores on 1st and 7th postoperative day were lower in group B (mean pain on 1st day was 1.71; with range of 1-3, while mean pain on 7th day was 0.21; with range of 0-1) as compared with group A (mean pain on 1st day was 1.768; with range of 0-4, while mean pain on 7th day was 0.538; with range of 0-2). Statistical analysis showed no significant difference between postoperative pain among the two groups.

Mann-Whitney U statistical test was used to assess the Percent change in facial swelling with significance level at 0.05. The mean percentage of change in facial swelling on 1st postoperative day in group A was 25.97%, as compared to 13.39% in group B. With the U value of 16 and z-score -3.6152, the difference was statistically significant (p-value 0.0003). There was considerable reduction in percentage of facial swelling in both the groups on 7th postoperative day with mean of 05.44% and 02.64% in group A and B respectively. However, the difference of facial swelling between the two groups was statistically significant (p-value 0.03078).

The mouth opening was measured as interincisal distance preoperatively and on 7th postoperative day and 1month. The interincisal distance on 7th postoperative day was 27.84 mm and 38.42 mm in group A and B respectively. T-Test was used for assessment of the two-independent means, with significance level of 0.05. The t-value at 7th day was -7.16975. The p-value was < .00001, which was statistically significant. The difference was close to preoperative baseline in both groups at one-month follow-up. The mean interincisal opening at 1 month was 39.61 mm and 40.85 mm respectively. The t-value was -0.776 and the p-value was 0.222, which was not significant statistically.

Evaluation of the primary outcome (success of surgery) included complete closure of the oroantral communication with lack of any nasal regurgitation. At 1-month follow-up no opening was seen in study group (group A). However, three patients (21.42%) in group B had dehiscence with oroantral communication. The patient who showed dehiscence had mean defect size of OAC of 35.33 mm, which was higher than the mean value of 24.57 mm for the entire group. Ecchymosis over buccal vestibule was seen in 3 patients of group A and 5 patients of group B. No other complications were seen in either group.

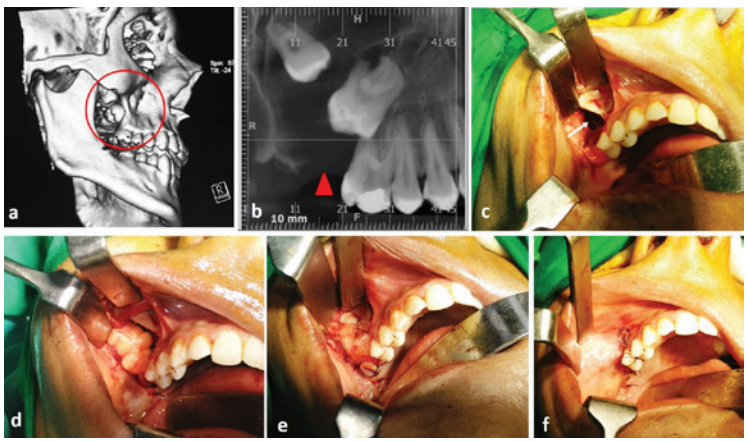


**Figure 1: Intraoperative steps in closure of OAC using combination of buccal fat pad and buccal mucosal flap; preoperative imaging showing cystic lesion in posterior maxilla with involvement of maxillary sinus (a, b), surgical defect resulting in OAC after cyst enucleation (c), mobilization of buccal fat pad encapsulated within its lining at the surgical site (d), closure of the defect with fat pad, note anchorage of the fat with sutures through the hole drilled over maxillary buttress (e), buccal mucosa advanced and sutured to attain double layer closure.**

**Figure 2: Dehiscence after surgical closure of large OAC using buccal fat pad.**

## Discussion

The present study intended to evaluate the efficacy of double layered closure (mucosa and fat) of composite defect of OAC. Traditionally both buccal fat pad and buccal advancement flap have been used independently for closure of OAC with varying success rate. Anatomically buccal fat pad is consolidated fat mass enclosed in thin capsule. It is present in the masticatory spaces of oro-maxillofacial region and contributes to the facial contour. This anatomic entity was first mentioned by Heister in 1732 and later described in detail by Bichat in 1802.[3] Egyedi first reported the use of buccal fat for repair of oral defects in 1977.[4] The fat mass receives its blood supply from vestibular branches of maxillary artery, transverse facial branches of superficial temporal artery and branches of facial artery. The rich blood supply and availability of the fat close to the defect of OAC explains its utility in management of OAC.

As advocated by Egyedi, conventionally buccal fat pad was lined with a skin graft, to aid in complete epithelization of the flap.[5] However, it is well documented that fat graft when used alone, adequately epithelizes on its own by 3$^{rd}$ to 4$^{th}$ week of inset.[6] There is limited evidence in literature regarding use of double layered closure using combination of flap for closure of OAC.[7] Advantage of combining buccal fat pad with buccal mucosa appear to have an advantage in case of closure of large size defect, where the buccal fat pad tends to gets unduly stretched or perforated. In all the cases of OAC treated with combination flap showed complete coverage with no dehiscence. Whereas use of single flap in control group, showed dehiscence in 21.42% cases. Dehiscence was seen in 3 cases with mean defect size of 35.33 mm, which was higher than the mean value of 24.57 mm for the entire group.

Candamourty R et.al. suggested that defects larger than 50 mm should be managed with combination of buccal fat pad with buccal advancement flap rather than fat pad alone.[8] Another indication for use of combination flap is lack of adequate volume of the fat graft available for harvest. The BFP has volume of 10 mL and weighs approximately 9.3 grams. When adequately dissected and mobilized it can provide 70× 40× 30 mm of pedicled graft.[9,10] However, the graft volume is greater in infants and children and reduces with age. Its size also varies among individuals. Volume of buccal fat pad may be inadequate in some cases, especially for large size defect

closure indicating the need of a combination flap.

Harvesting and inset of buccal fat pad is relatively simple. However, care should be taken to gently harvest the flap with blunt dissection without breakage of its thin capsule. The flap should be suture without tension. Anchoring of the fat tissue to the malar buttress after drilling holes through it was used to further stabilize the flap in the presented cases when indicated (figure 1e). This possibly adapts the flap better over the defect and when combined with mucosal layer provides composite closure of the OAC. Although relatively safe, minor complications have been associated with harvesting buccal fat pad which includes; haematoma, flap necrosis, scarring, infection and facial nerve damage.[11] Evaluation of post-operative sequel showed no statistically significant difference in pain and mouth opening between the two groups at 7$^{th}$ and 30$^{th}$ postoperative days respectively. However, swelling was relatively more when combination of buccal fat pad and buccal advancement flap was used, understandably because of greater tissue dissection and handling. Flap dehiscence was seen in 3 patients with single layer closure, whereas self-limiting ecchymosis in buccal vestibule was observed in total of 8 patients. No case of facial damage or infection was seen. Harvesting the flap in patients with previous radiotherapy, midface and malar hypoplasia and thin cheeks are relatively contraindicated. In the present cases contraindications of the procedure were; uncontrolled diabetes mellitus, history of radiation therapy, ablative defect after resection of malignancy and patients on long term steroid therapy. Double/combination flap took more time for completion of the procedure (group A-mean time of 42.23 minutes, group B-mean time 26.21 minutes). The greater time taken was due to need of harvesting of two flaps in group A as compared to one in group B.

## Conclusion

Combination of buccal fat pad and buccal advancement flap provides double layered closure of the composite defect of OAC. The technique is efficient in management of OAC and can be especially used in case of larger defect size. The postoperative sequel of using the combination flap is similar compared to single layer closure with buccal fat pad.

**Ethical Clearance**- Taken from Institution Ethical committee of Krishna Institute of Medical Sciences Deemed to be University, Karad

**Source of Funding**- None

**Conflict of Interest**: None

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# Information Booklet on Self-Care Management of Chemotherapy among gynecological Cancer Survivors at Selected Hospital, Mangalore, Karnataka

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## Abstract

**Background of the study:** Cancers of the female reproductive tract and breast has a high incidence amongst Indian women. Cancer registries have also highlighted that more than 70% of cancers in females occur in the age group of 35-64, and that these cancers exercise an adverse influence on the productive role of women in our society. Chemotherapy is a type of cancer treatment that uses one or more anti-cancer drugs that can have severe adverse effects on the patient both during the therapy and for some time after.

**Title of the study**: Information Booklet on Self-Care Management of Chemotherapy among gynecological Cancer Survivors at Selected Hospital.

**Objectives**

1) To assess the knowledge on self-care management of chemotherapy among Gynecological cancer survivors

2) To determine the effectiveness of information booklet on self-care management of chemotherapy among Gynecological cancer survivors

**Hypothesis:** H1: The mean posttest knowledge level will be significantly higher than mean pretest knowledge level on self-care management of chemotherapy among Gynecological cancer survivors.

**Methodology**: Quantitative research approach and the design adopted was pre experimental in this study. The investigator selected total of 60gynaecologic cancer survivors receiving chemotherapy through purposive sampling technique. The researcher collected the data from the participants with the help of validated knowledge questionnaire and demographic Performa information before administering self care management information booklet. The information booklet was comprised of side effects and management of chemotherapy with pictorial depiction. The posttest was conducted at the immediate subsequent cycle of chemotherapy. The obtained data were analyzed by using descriptive & inferential statistics.

**Results**: The result of the present study showed that the mean post-test knowledge score (11.63) of gynecologic cancer survivors were significantly higher than their mean pre-test knowledge score (7.90). The calculated‘t’ value was (15.562) and’ p’ value is less than 0.05.Hence the research hypothesis was accepted at 5% level significance.

***Key Words:*** *Chemotherapy, information booklet, gynecological cancer survivors.*

## Introduction

Cancer is a group of diseases involving abnormal cell growth with the potential to invade or spread to other parts of the body. Gynecological cancer induces a major break in every-day life and a threat to existence for both the patients and their families. Many gynecological cancer patients experience physical,

psychological, social, practical and economic challenges during treatment. Gynecological cancer requires multi-disciplinary management. Chemotherapy may be used as adjuvant therapy or for management of locally advanced or recurrent tumors[1].

Chemotherapy affects healthy body cells as well as cancer cells and its side effects mainly depend on the dose of chemotherapy drug what is administered to the patients. However, most women will suffer some short-term side effects with chemotherapy and different people's bodies can also react differently to the same type and dose of drugs. While receiving treatment, the patient would suffer from uncomfortable feelings which include fatigue, hair fall, anorexia, nausea, vomiting, constipation, diarrhea, mouth sores and low white blood cell, anemia and thrombocytopenia[3]. Low platelets can cause abnormal bleeding. Health personals are responsible for encouraging and promoting proper self-care of the patients being treated with chemotherapy.

Although some side effects of chemotherapy drugs such as nausea can occur within minutes to days after the drugs are given, a potentially life-threatening side effect such as myelosuppression can occur from one to four weeks. Patients and families need to become more familiar with their disease, treatment regimens, and side effects[3].

The nurse's responsibility is to assess these patients and determine their educational needs regarding drugs, potential side effects, and appropriate self-care measures. Once patients gain adequate knowledge about their drugs and self-care measures, they should be able to distinguish when they can manage their side effects at home or when they should seek medical attention[2].

The present study focuses on self-care management of cancer patients treated with chemotherapy, in order to promote appropriate self-care behaviors. Empowering patients toward effective self-care can be done by providing knowledge and understanding.

## Materials & Method

The investigator selected total of 60 gynecological cancer survivors receiving chemotherapy through purposive sampling technique. The research instrument was validated by the experts. The researcher obtained the internal consistency of the instrument through split half method and the Karl Pearson correlation coefficient 'r' value was (0.76) and the instrument was found reliable.

**Ethical consideration:** The investigator obtained ethical clearance from the ethics committee of the institution. The investigator met the subjects and explained the purpose, procedure, benefits, duration of the research, and their role in the study. Investigator obtained informed consent and assured confidentiality of the information.

**Data collection procedure:** The researcher took permission from the concerned authority before starting data collection. The investigator administered the demographic Performa and structured knowledge questionnaire to the subjects before administering the information booklet on self care management of chemotherapy. The demographic Performa comprised of 15 items which include age in years, religion, educational status, occupation, marital status, type of family, monthly income, family history of cancer, previous history of cancer, age of menarche, age of menopause, whether menopause was chemotherapy induced, have you used contraceptives in past, parity, history of breastfeeding. The knowledge questionnaire comprised of 20 items. The researcher distributed the information booklet to all participants and post test was conducted at the immediate subsequent cycle of chemotherapy. The components of information booklet included the side effects of chemotherapy and its management. The investigator translated the tools to Kannada and then back to English. The participants took nearly 15 minutes to complete the self reported questionnaire

## Results

**Demographic findings:** Distribution of subjects according to the age showed that majority (40%) belongs to more than 60 years. Majority (91.7%) of clients belongs to Hindu religion. 16.7% of the subjects had family history of cancer (breast and stomach) while only 1.67% subjects had previous history of cancer. Only 6% of the client used intrauterine contraceptive such as Cu-T and 15% of subjects were nulliparous.. 85% of subjects' breast fed their children. 75% of the subjects attained their menopause at the age of 50-54 years out of which only 2 subjects had chemotherapy induced menopause.

81.7% of the subjects were married and 83.3% belonged to a modern nuclear family.

**Table 1:-Level of knowledge on self-care management. n=60**

| LEVEL OF KNOWLEDGE | PRE TEST | | POST TEST | |
|---|---|---|---|---|
| | Frequency(f) | Percentage (%) | Frequency (f) | Percentage (%) |
| Poor (0-6) | 14 | 23.3 | 0 | 0 |
| Average (7-13) | 46 | 76.7 | 43 | 71.7 |
| Good (14-20) | 0 | 0 | 17 | 28.3 |

**TABLE 2: Effectiveness of information booklet on self-care management during chemotherapy**

**n=60**

| Group | Mean | SD | Calculated t-value | df | LOS |
|---|---|---|---|---|---|
| Pre - test | 7.90 | 2.072 | 15.562 | 59 | p<0.001 HS |
| Post - test | 11.63 | 2.577 | | | |

Hs-Highly Significant

The data depicted in the table shows, the 'p' value is less than 0.001and there was a difference in the mean preinterventional knowledge score and mean post interventional knowledge score. Hence the research hypothesis was accepted.

## Discussion

The findings of the present study are compared with other studies to translate the available data into information. Majority (40%) of the subjects were above 60 years. Majority (91.7%) of clients belongs to Hindu religion. 16.7% of the subjects had family history of cancer (breast and stomach) while only 1.67% subjects had previous history of cancer. Only 6% of the client used intrauterine contraceptive such as Cu-T and 15% of subjects were nulliparous.. 85% of subjects' breast fed their children. 75% of the subjects attained their menopause at the age of 50-54 years out of which only 2 subjects had chemotherapy induced menopause. 81.7% of the subjects were married and 83.3% belonged to a modern nuclear family.

The above findings are contradicted by descriptive study conducted at multispecialty, teaching hospital in Uttarakhand, on Knowledge Regarding ill Effects of Chemotherapy and Its Home Management among Patients Receiving Chemotherapy showed that majority 22 (37%) of cancer patients falls between the ages of 49 to 64 years; 19 (32%) fell between the ages group 33 to 48 years; 10 (17%) fell between the ages group 65 to 82 years and 9 (15%) were found between 17 to 32 years

In the present study the investigator observed that (28.3%) subjects scored good knowledge and (71.7 %) scored average knowledge related to self

care management of chemotherapy caused side effects and there was a difference between the mean preinterventional knowledge score and mean post interventional knowledge score. Hence the research hypothesis was accepted and the information booklet was effective to improve their knowledge.

A descriptive study on Knowledge Regarding ill Effects of Chemotherapy and Its Home Management among Patients Receiving Chemotherapy was conducted at multispecialty, teaching hospital in Uttarakhand and the result showed majority of the cancer patients (63%) had only satisfactory knowledge,30% patients showed good level of knowledge and only 7% patients had poor level of knowledge[4].

Another descriptive cross-sectional hospital based study on Knowledge on Management of Chemotherapy Related Side-effects among 70 Cancer Patients conducted at Bhaktapur Cancer Hospital to support the present study. 54.9% of cancer patients knew that drinking too much liquid during the day removes the harmful agents from the body. 28.4% of the respondents ate high fiber foods with adequate fluid to manage constipation, 45.9% respondents perfumed oral care and gargle 3-4 times daily for management of stomatitis and mucositis, 67.6% of respondents took anti-emetic medication before meals for management of nausea and vomiting, 40.5% of responded drank more fluid than usually with ORS for management of diarrhea, 43.2% respondent put on scarf and cap/wig for management of hair loss. Over all findings showed that (58.1%) of respondents had average knowledge, (39.2%) had poor knowledge, and (2.7%) had good knowledge on management of chemotherapy related side effects.

## Conclusion

The diagnosis of cancer and its treatments are one of the most fearful life events which affect the general wellbeing of patients. Patients require knowledge and understanding about the health condition to overcome the physical and psychosocial distress caused by the cancer diagnosis and chemotherapy to improve their quality of life and, the health care professionals can play a major role to make them aware and equip with them sufficient knowledge on self-care strategies[5]. The investigator found lack of knowledge among cancer survivors regarding self management of chemotherapy from above study findings; hence there is a need for conducting such studies.

**Acknowledgement:** The authors thank wholeheartedly the participants for their cooperation during the study.

**Conflicts of Interest:** None

**Funding:** This is a self funded study

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# Effect of Yoga Therapy on State and Trait Anxiety in Perimenopausal Women: A Non-Randomized Controlled Study

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## Abstract

High rates of anxiety symptoms have been reported in early or late perimenopausal women. The objective of this study was to determine the efficacy of 12-week Hatha yoga on state and trait anxiety score in perimenopausal women and to compare it with physical exercise (control) group. 247 women aged between 40 and 60 years experiencing perimenopausal symptoms were recruited, after 12.5 % loss to follow up, 216 women participated either in a yoga group (n=111) or a physical exercise group (n=105). The intervention in the yoga or control group consisted of a lecture, demonstration and practice session of 45 minutes each day for 12 weeks. State and trait anxiety was assessed using STAI inventory. State and trait anxiety was reduced significantly in the yoga group but not in the control group. Yoga intervention is effective in reducing state and trait anxiety than the physical exercise in women experiencing perimenopausal symptoms.

***Key words:*** *State and trait anxiety, Yoga, Physical exercise, Perimenopause, Cortisol*

## Introduction

Women in menopausal transition are four times as likely to develop depressive symptoms compared to premenopausal women. [1] Anxiety is the most experienced symptom of a depressive episode. In menopause, it is associated with vasomotor symptoms, nausea, distress, difficulty in initiating sleep (DIS) and impaired quality of life. [2] Previous studies have reported significantly high rates of anxiety symptoms in early or late perimenopausal women than premenopausal women. [3, 4] This anxiety is further classified by Spielberger into state or trait anxiety. [5] State anxiety is an unpleasant feeling or state of mind when the person faces a particular condition, demand, situation, event or an object. On the contrary, trait anxiety is a subjective phenomenon. It is based on the personality characteristic than on the transitory feeling. There is heightened oxidative stress in middle-aged women, more so during the menopausal transition. [6] Different measures have been used to relieve this stress, anxiety and calm the mind. Short term lifestyle intervention has been most promising in decreasing the anxiety, depression, stress and improving the overall well-being of an individual. Among these, yoga is reported to be the most effective modality to bring down stress, anxiety and to increase the antioxidant levels in the body. [7, 8] Yoga not only decreases anxiety but also enhances attention, cognitive functions, mood, wellbeing, mental focus and tolerance to stress. [9] Prior clinical study reported that yoga-based lifestyle intervention can decrease state and trait anxiety in diseased subjects. [10] Elavsky et al reproduce this study in middle-aged women and indicated that walking and yoga can improve fitness, which in turn reduces the reported symptoms in menopause. [11] The physical exercise is one modality which is compared with yoga. Previous reports have indicated that exercise improves

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sleep quality and decrease depression in midlife women but does not improve the vasomotor symptoms. [12] Systematic review by Cramer et al indicated that yoga is effective in reducing menopausal symptoms and far superior in reducing vasomotor symptoms compared to exercise and for other symptoms (psychological, somatic, and urogenital) it is as effective as other exercises. [13] Thus both the modality are comparable and equally effective in menopause.

Considering above reports this study was planned to assess the efficacy of 12-week hatha yoga on state and trait anxiety score in perimenopausal women compared to the physical exercise (control) group. Serum cortisol and protein thiol were also calculated in both the groups to ascertain the efficacy of yoga in improving antioxidant power in anxiety disorders.

## Materials and Method

Participants

A total of 247 women aged between 40 and 60 years experiencing perimenopausal symptoms were included in the study with 216 women following up to the end of the study. Participants were recruited from self-help groups, women's organizations and rotary clubs through personal contact. Institutional ethical committee (IEC) permission was taken and participation was kept voluntary. Participant's information sheet was distributed to all participants which explain about the procedure and intervention detail and informed consent were obtained from all the volunteers who participated in the study.

**Study design**

This was a non-randomised control trial. 247 women participated at the beginning of the study (Figure 1). They were voluntarily divided into either a yoga therapy group (test group, n=127) or physical exercise group (control group, n=120). These groups were further subdivided, yoga therapy group (n=127) was divided into 10 subgroups and physical exercise group (n=120) was divided into 6 subgroups. After 12.59% loss to follow up in yoga group and 12.5% loss to follow up in control group, the remaining 216 women participated either in a yoga group (n=111) or a control group (physical exercise) (n=105). The intervention for both (test & control) the groups was, practicing a given protocol for 45 mins daily for 12 weeks. All the participants of the respective group (yoga or control) attended all the sessions scheduled for the group.

Yoga intervention

The intervention in the yoga therapy module consisted of a lecture, demonstration and practice session of 45 minutes each day for 12 weeks. The yogic asanas and pranayamas that were followed in this study have been tested and published previously. [14]

Control group

In the control group, the practice session consisted of loosening exercises for 10-15 minutes and strengthening exercises (while standing) for 30-35 minutes. The set of physical exercise that were followed in this study were standard exercises for mild to moderate activity and has been designed by experts in physical education, tested and published in previously. [15]

Study assessments

1. The irregularity of the periods and the reported length of time since the last menstrual period was used as a basis to determine menopausal status.

2. A self-administered questionnaire on State and Trait Anxiety Inventory for Adult [STAI] [5] was used to differentiate between the 'state anxiety' and the 'trait anxiety'

3. Blood samples (2 mL) were drawn one day prior to the schedule start day of the intervention and the day following the last day of the intervention between 7.30 am and 9.00 am. The serum was separated and used for measurement of protein thiols, which was done spectrophotometrically using DTNB (5',5'-dithio-bis-2-nitrobenzoic acid). [16] Serum cortisol was measured by chemiluminescent immunoassay. [17]

## Statistical Analysis

Statistical analysis was performed using Statistical Package for Social Sciences, version 15.0 (SPSS South Asia, Bangalore) for a level of statistical significance of 5%. Characteristics of the participants are presented as the percentage for categorical variables and mean ± standard deviation for continuous variables. Two way repeated measures ANOVA was used to compare the results within the group and between the groups. Spearman's rank correlation was used to get the correlation between the two variables.

## Results

The study included 216 women with perimenopausal symptoms with a mean age of 48.3 ± 4.6 years in the yoga group and 48.3± 5.1 years in the control group. The data on state and trait anxiety showed a significant improvement (p=0.001) from baseline to 12 weeks, as assessed by STAI. This significant improvement was observed in yoga group compared to control group. Post-intervention, serum cortisol level was unchanged in the yoga group and increased (p=0.04) in the control group. Serum total thiols increased in both the groups but the increase was not significant in the yoga group, whereas in control group and between the group the difference was statistically significant (p=0.001) (Table 1).

**Table 1: Mean Score of state and trait anxiety, cortisol and protein thiols before and after the intervention in both the groups.**

| Test | Results | Yoga (n = 111) | Control (n = 105) | p value |
|---|---|---|---|---|
| State anxiety | • Pre<br>• Post<br>• p value | 35.09±10.47<br>28.51±9.34<br>0.001* | 38.47±10.85<br>37.92±11.53<br>0.50 | 0.001‡ |
| Trait anxiety | • Pre<br>• Post<br>• p value | 39.32±10.01<br>32.03±9.79<br>0.001* | 41.90±9.91<br>40.71±10.16<br>0.14 † | 0.001‡ |
| Cortisol (µg/dl) | • Pre<br>• Post<br>• p value | 14.16±5.62<br>14.46±5.73<br>0.57 † | 12.86±5.36<br>13.93±5.31<br>0.04* | 0.17 § |
| Total serum thiols (µmol/L) | • Pre<br>• Post<br>• p value | 308.82±62.97<br>313.93±64.00<br>0.56 † | 267.06±98.17<br>314.10±62.94<br>0.001* | 0.001‡ |

*significant increase within the group, †no significant change within the group, ‡significant difference between the groups, § no significant difference between the groups.

Significant (p< 0.001) positive correlation was observed between state and trait anxiety score in both the groups. Cortisol and thiol were positively correlated in both the groups in two time period and significant (p< 0.001) positive correlation was observed after the intervention of yoga. The details of the correlation between each variable are given in Table 2.

**Table 2: Correlation between the STAI scores and cortisol and thiols in both the groups before and after the intervention**

| Parameters | Yoga group | | | | Control group | | | |
|---|---|---|---|---|---|---|---|---|
| | Pre | | Post | | Pre | | Post | |
| | r value | p value | r value | p value | r value | p value | r value | p value |
| Trait anxiety and state anxiety | 0.895 | < 0.001* | 0.880 | < 0.001* | 0.831 | <0.001* | 0.828 | <0.001* |
| Cortisol and thiols | 0.103 | 0.282 | 0.349 | < 0.001* | 0.037 | 0.710 | 0.155 | 0.115 |

*Correlation is significant at p< 0.001, Spearman's correlation was used to get the association between the variables.

## Discussion

In the current study, 12 weeks of yoga intervention is associated with a significant reduction in the state and trait anxiety score compared to controls who practiced physical exercise. Previous report indicated that yoga keeps a check on sympathetic over activity and helps in calming the body and mind and reduces the anxiety. [18] Prior clinical studies have reported the similar trend in state and trait anxiety score on normal and diseased subjects. [10] But all these studies are based on individuals without a formal diagnosis of anxiety by Diagnostic and Statistical Manual (DSM) criteria. A recent meta-analysis by Cramer et al indicated that yoga has no effect on anxiety which was diagnosed by DSM criteria. Yoga showed an effect on anxiety only in those studies which do not have a formal diagnosis or the diagnostic was done using other methods. [19] Thus reduction in state and trait anxiety score in yoga group should not be considered as reduction in anxiety levels unless diagnosed by DSM criteria. The serum levels of cortisol remain unaltered and protein thiols showed a slight increase in the yoga group but significant increase in the control group. Serum cortisol levels tend to increase in situations of acute psychological stress and anxiety disorders. [20] This cortisol level might be deranged due to loss of homeostatic control of Hypothalamic-Pituitary-Adrenal (HPA) axis with advancing age in perimenopausal women. [21] It is hypothesized that yoga down regulates the sympathetic nervous system (SNS) and HPA axis and thus helps in maintaining the cortisol levels. [22] Our results on serum cortisol is in line with previous report by Schell et al. They reported an improvement in psychological parameters post yoga intervention but cortisol remain unchanged. [23] On the contrary, physical exercise tends to increase the cortisol levels by stimulating the HPA axis and SNS. [24] The intensity of the exercise provoke an increase in the cortisol levels but the final level depends upon the total duration of exercise session. Previous studies have indicated that acute exercise increases the oxidant levels in the untrained individuals or beginner but continuous exercise can increase the antioxidant levels either by upregulating the endogenous antioxidants or by increasing the mobilization of antioxidants from the tissue stores to provide protection against ROS induced lipid peroxidation.[25] In the present study, we have observed a significant increase in the levels of protein thiols post-intervention in the control group (physical exercise) which indicates that it as an adaptive response to protect the cells against oxidants and to maintain cellular oxidant-antioxidant homeostasis during exercise. [26, 27] Previous studies have indicated that regular practice of yoga between 12 weeks to 6 months attenuates oxidative stress and increases total glutathione (GSH) content. [28] Glutathione being abundant in thiols,

we observed a slight increase in protein thiol levels post yoga intervention. But this increase was not statistically significant when compared to pre-intervention levels. Probably a longer duration of yoga therapy can bring about the significant change in the protein thiol levels. Therefore for future research, longer duration of yoga intervention at least for 6 months could be tried along with the measurement of norepinephrine and epinephrine to establish the association between catecholamine levels and reduction in anxiety post yoga intervention. The oxidation products such as 4-hydroxynonenal, protein carbonyls, and additional antioxidant enzymes can be measured to support the efficacy of yoga in improving the antioxidant status (protein thiols) and decreasing the anxiety in women with perimenopausal symptoms.

## Conclusion

This study suggests that 12 weeks of yoga practice can reduce state and trait anxiety score in women with perimenopausal symptoms but could not bring about an effective change in the serum levels of cortisol and protein thiols in women experiencing perimenopausal symptoms. Based on the above findings, yoga can be considered at least as effective as physical exercise. Therefore, the regular practice of yoga during menopausal transition can help these women in reducing the anxiety and stress related to perimenopausal symptoms and improve the quality of life.

**Source of Funding:** This study is funded by departmental funds and no other external funding is been obtained.

**Conflict of Interest:** Nil

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Original Paper

# A Clinical Study of Complicated Inguinal Hernia with Special Reference to Its Management

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## Abstract

**Introduction:** The complications of hernias are incarceration, strangulation, and bowel obstruction. The reasons for the simple hernia to go into complications are of manyfold including lack of public awareness of the dangers of hernia complications, etc. Therefore, evaluating the high-risk causes of the complicated inguinal hernia and its effective management is very important in clinical practice. Materials and methods: It was a hospital-based prospective observational study. Results: The complicated inguinal hernia was observed with a male and female ratio of 24:1 and highest (30%) frequency in the age group of 50-60 years. The right-sided involvement was seen in 33(66%) cases with more features of strangulation. The primary and recurrent hernia was observed in 48(96 %) and 2(4 %) cases respectively. Complications are more in 35(70 %) cases with a short duration (<1 yr). The pain and irreducible groin swelling were seen in all 50(100%) of cases. Viability of content as per intraoperative finding where gangrenous/strangulated bowel was found in 18(36%) cases. Reduction and Hernioplasty was done in 28(56) of cases. Conclusion: A systematic evaluation of clinical features with early intervention help in the management of the cases effre3ctively to reduce mortality and morbidity.

***Keywords:*** *Pain; time lapsed; gangrenous resection anastomosis; herniorrhaphy.*

## Introduction

A hernia is a protrusion of a viscus or part of a viscus through an abnormal opening in the walls of its containing cavity.[1]

Seventy-five per cent of all abdominal wall hernias are found in the groin, making it the most common location for an abdominal wall hernia. Of all groin hernias, 95% are the hernias of the inguinal canal with the remaining being femoral hernia defects. Inguinal hernias are nine times more common in men than in women. The overall lifetime risk of developing a groin hernia is approximately 15% in males and less than 5% in females. Inguinal hernias are further divided by anatomical location into direct and indirect types. This differentiation is based on the location of the actual hernia defect concerning the inferior epigastric vessels.[2] Indirect inguinal hernias strangulate more commonly, the direct variety not so often because of the wide neck of the sac.[1]

There is an association between age and hernia diagnosis. After an initial peak in the infant, groin hernias become more prevalent with advancing age. In the same way, the complications of hernias (incarceration, strangulation, and bowel obstruction) are found more commonly at the extremes of age.[2]

The reasons for the simple hernia to go into complications include lack of public awareness of the dangers of hernia complications and reluctance on behalf of the non-surgical medical personnel to refer patients with known risk factors.[3]

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An inguinal hernia either direct and indirect is one of the most common problems that we face in our routine surgical practice and uncomplicated hernia possess no difficulty so far as many advances are present for the repair of the defect. Management of these complicated hernias is different from uncomplicated hernias. Most important is the morbidity and mortality associated with this hernias.[4]

This paper aims to find out the high-risk factors for the development of the complicated inguinal hernia and also to find out effective management of the operated patients.

## Materials and Method

It was a prospective observational study. The study consists of 50 cases undergone surgery for complicated inguinal hernia in various surgical units in Gauhati Medical College and Hospital, Guwahati, Assam during the period July 1st 2017 to June 30th 2018. The study was conducted among patients admitted from casualty with the complaint of a groin swelling and associated features of its complication, who were of age above 12 years and with the unilateral hernia. Before collection of the data ethical approval was obtained from the ethics committee (Human).

## Results

In our present study, we found that out of the 50 patients of complicated inguinal hernia involved dominantly the male population (96%) as compared to females (4%) giving a male and female ratio of 24:1 as shown in **Fig**. **1**.

**Fig. 1 Sex-wise inguinal hernia patients**

Out of 50 patients maximum cases, (30%) presented complicated Hernia that falls under the age group (50-60) years and very less number of cases below 20 years (**Fig. 2**).

**Fig. 2 Distribution of inguinal hernia patients according to age**

The present study reveals that inguinal hernias more common on right side 33(66%) than that in left side 17(34%). Right-sided hernias tend more to present with features of strangulation than left side; $p < .0448$ which is statistically significant. We have also found that 48(96%) of patients had a primary hernia and only 2(4%) had a recurrent hernia. The hernias with a short duration (<1 yr) were those who mostly developed the highest rate of complications with 35 cases (70%).

**Table 1 Symptoms of complications**

| Symptoms | No. of patients | Percentage |
|---|---|---|
| Pain | 50 | 100 |
| Irreducible Groin Swelling | 50 | 100 |
| Vomiting | 32 | 64 |
| Absolute Constipation | 30 | 60 |
| Fever | 10 | 20 |

In our study, pain and irreducible groin swelling were seen in all 50(100%) of cases. Details are shown in

**Table 1**.: The three categories, i.e., irreducible, obstructed and strangulated inguinal hernia based on relevant clinical symptoms and signs are shown in **Table 2** with their frequencies.

**Table 2 Clinical presentation**

| Presentation | No. of patients | Percentage |
|---|---|---|
| Irreducibility/ Incarceration | 20 | 40 |
| Obstructed | 18 | 36 |
| Strangulation | 12 | 24 |

Viability of content as per intraoperative finding where gangrenous/strangulated bowel was found in 18(36%) of the total cases as shown in **Table 3**.

**Table 3 Viability of content as per intraoperative finding**

| Status of Content | Contents | | |
|---|---|---|---|
| | Bowel | Omentum | Total |
| Viable | 19(38%) | 10(2%) | 29 |
| Gangrenous | 18(36%) | 3(6%) | 21 |
| Total | 37(74%) | 13(26%) | 50 |

It has been found that among the 28 patients who presented > 24 hrs after onset of symptoms 17(60.71%) had gangrenous changes of bowel requiring resection, compared to 9 patients who presented < 24 hrs where the resection rate is 11.11% (p - < 0.0188) as shown in **Table 4**.

**Table 4 Time elapsed from the onset of symptoms & presentation and the status of bowel intraoperatively**

| Time elapsed | Viable bowel (not requiring resection) | Gangrenous bowel (requiring resection) | Total |
|---|---|---|---|
| <24 Hrs | 8 | 1(11.11%) | 9 |
| >24 Hrs | 11 | 17(60.71%) | 28 |
| TOTAL | 19 | 18 | 37 |

The evaluation of the result shows that the majority(90%) of complicated inguinal hernia is indirect and the rest (10%) are the direct hernia.

The details operative procedures undertaken were shown in **Table 5**.

**Table 5 Operative Procedure performed**

| Procedure Performed | Number (%) |
|---|---|
| Reduction and Hernioplasty | 28(56) |
| Omentectomy and Herniorrhaphy | 3(6) |
| Resection of Bowel with Herniorrhaphy | 16(32) |
| Resection of bowel with Stoma formation with Herniorrhaphy | 2(4) |
| Appendicectomy with Herniorrhaphy | 1(2) |
| Total | 50(100) |

## Discussion

The male and female ratio (24:1) in the current study among the complicated of inguinal hernia in the present study is in the consistency of Hariprasad et al.[5]

This finding of ours was following that of the study done by Hariprasad et al.[5], where the author observed that the majority (22.5%) of patients with complicated inguinal hernia presented in $5^{th}$ -$6^{th}$ decade of life.

The right-sided hernias tend more to present with features of strangulation than left-sided hernias (p < .0448). These findings are in concordance with S Rai et al.,[3] NJ Andrews et al.,[6] Hariprasad et al.,[5] and Prakash JS.[7]

The hernias (70%) presented with complication did so within 1 year of duration. This finding was following the result of the study done by S Rai et al.[3] where the author described that short duration of a hernia was found to be a very significant risk factor which predicted complication. The author noted that the majority of adults with complicated hernias (65.8 %) had the hernia for a duration less than or equal to 1 year (p- < 0.05).

The primary hernias were observed in 96% of patients and the rest 4% were the recurrent hernia.

The type of hernia also affects the viability of content, especially recurrent hernias. In our study, there were 2 recurrent hernias and both of the cases had gangrenous contents and needed resection. S Rai et al.,[3] also noted a similar finding in his study where all 4 cases of recurrent hernia underwent resection and the author have regarded recurrent hernias to be susceptible to strangulation. NJ Andrews et al.,[6] also observed that risk of strangulation in recurrent hernia is more as compared to primary hernias, the increased risk has been attributed to their having narrow irregular defects with unyielding walls; the author also concluded that strangulated recurrent hernias were associated with high morbidity and mortality.

In the current study, pain and irreducible groin swelling were seen in all 50(100%) of cases; vomiting was seen in 32(64%) cases while absolute constipation was seen in 30(60%) cases and fever was present in 10 (20%) cases. Similarly, Manish Baria et al.,[4] in their study has observed that pain and irreducible hernia swelling was present in all the cases (100%), 30% of patients had nausea, vomiting, constipation and abdominal distension was present in 20% of cases each.

Incidence rates of symptoms obtained by Prakash JS et al.,[7] in their study also shows a similar pattern, pain and irreducibility in 100% of cases, vomiting in 82.8%, abdominal distension in 80%, constipation in 74.35 and fever in 25.7% cases. Hariprasad et al., [5] in their study have observed similar findings. Irreducibility of the hernia swelling, absent cough impulse and local tenderness were seen in all 50(100%) cases; abdominal tenderness was seen in 30(60%) of cases while abdominal muscle guarding and absent bowel sound was observed in 18(36%) of cases. Similar results are obtained by Hariprasad et al.,[5] and Muhammad Hasan Abbas et al.[8]

Signs of peritonitis which predict strangulation significantly among other clinical features were observed which agree Muhammad Hasan Abbas et al.[8] The author stated that in the absence of obvious peritonitis, clinical signs cannot reveal the condition of incarcerated bowel. There may be speculation based on the duration of symptoms and hernia type but the only safe management is early operation after necessary resuscitation as stated by NJ Andrews et al.,[6]

The results report that 40% of cases presented with painful irreducibility; 36% of patients presented with features of obstruction, and 24% cases with features of strangulation which agrees Manish Baria et al.[4]

A total of 28 patients who presented 24 hours after the onset of symptoms, 17(60.71%) cases developed gangrenous changes of bowel requiring resection which is in support of Hariprasad et al.,[5] and Kulah B et al.[9]

Viability of the contents in complicated hernias correlated significantly with the delay in presentation; The greater the delay, greater the risk for strangulation.[3] Martinez-Serrano et al.,[10] revealed higher rates of mortality in patients with acute complication as their first hernia related symptom and whose treatment was delayed for more than 24 hours.

Thus in 36% cases, general anaesthesia was given and 64% cases spinal was given. All cases where strangulation was suspected and peritonitis were there general anaesthesia was preferred where there was a strong suspicion of strangulation. These findings are following Brindelli et al.,[11] and Rene E Stoppa,[12]

The higher frequency of indirect inguinal hernias of the current study agrees Hariprasad et al.[5] The viability of contents of the current study are in support of Hariprasad et al.[5]

In the current study, 18 cases had gangrenous bowel as content requiring resection, 16 underwent resection with herniorrhaphy and 2, resection with a stoma with herniorrhaphy. 28 cases where the content was viable underwent reduction and hernioplasty as the surgical field was clean and hernioplasty prevents recurrence; 3 cases where the omentum was necrotic, omentectomy with herniorrhaphy was done; in one case there was inflamed appendix as content so appendicectomy with herniorrhaphy was done. The surgical procedures undertaken agree with Manish Baria et al.,[4] and Rives et al.[13]

## Conclusion

Elderly age group is most susceptible for development of hernia complications with a higher frequency in male. Right-sided hernias develop more complications. Direct hernias are much less affected than indirect hernias.

Hernia of short duration is also found to be more prone to develop complications. Recurrent cases had gangrenous content and needed resection. Pain and irreducibility of groin swelling were the most common presenting symptoms, other being vomiting, absolute constipation and fever. The signs of peritonitis including muscle rigidity and absent bowel sound predictive of strangulation.

The raised total leukocyte count was found to be significantly predictive of strangulation. Spinal anaesthesia was preferred. All cases where bowel was gangrenous resection anastomosis was done followed by herniorrhaphy (Bassini); similarly, in cases with gangrenous omentum omentectomy with herniorrhaphy was done. Cases, where the content was the viable reduction of the content and Lichtenstein tension free hernioplasty, was done. The outcome of 70% of cases in this study went uneventful, 10% of cases developed wound infection.

**Ethical Clearance**: Taken.

**Conflict of Interest**: None declared.

**Source Of Funding**: None declared.

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# A Comparative Study of Medical Termination of Pregnancy Act, 1971 with Recent Medical Termination of Pregnancy (Amendment) Bill, 2020 Through Judicial Pronouncement

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## Abstract

Recently Cabinet has passed the proposed Medical Termination of Pregnancy (Amendment) Bill, 2020. In current bill certain changes has been made regarding the upper limit of gestational age for termination of pregnancy under MTP Act, 1971. Through this paper researcher will discuss about the drawback of the MTP (Amendment) Bill, 2020 in terms of gestational age with the help of the various judicial pro-announcement.

***Keywords***- *Abortion, Miscarriage, Right to life, Gestation, Reproductive right*

## Introduction

The current MTP Bill of 2020 has proposed certain amendments under Section 3 of the MTP Act, 1971. The Bill[1] generally speaks about two important points relating to amendments-

I. Abortion right- This bill speaks about the abortion right for single or unmarried lady which is not allowed in MTP Act of 1971.Prior to this Bill, even in MTP (Amendment) Bill, 2014 it was suggested to include single and unmarried lady for abortion right.

II. Gestational age- Upper age limit for termination of pregnancy for rape victim is suggested to be increased up to 24 weeks and for fetal abnormalities there will be no limit.

The current Bill of 2020 has considered the single and unmarried women right for abortion because in last few years various courts in India including Supreme Court, considered Live-in relationship as legal. In **Khushboo versus Kanniammal, 2010 5 SCC 600** the Honorable Supreme Court held that "that a living relationship comes within the ambit of right to life under Article 21 of the Constitution of India. The Court further held that live-in relationships are permissible and the act of two major living together cannot be considered illegal or unlawful[2]".

To know about the drawback of current and previous Bill of MTP, first we have to know about Section 3 of The MTP Act, 1971. Section 3 of The MTP Act, 1971 deals with When Pregnancies may be terminated by registered medical practitioners. If we go through the Section 3 then we will find that basically it allows abortion only in three grounds-

i. *When the continuation of the pregnancy will risk mother life or grave injury to physical or mental health*[3].

Explanations 1 and 2 of Section 3 are the only two situations where it is considered that continuation of the pregnancy will risk mother life or it will cause grave injury to her physical or mental health i.e.

a. For the Victim of rape and

b. For married women when she get pregnant on the ground of failure of any contraceptive device used by her or by her husband.

ii. *When there is a substantial risk that if the child born, it will suffer from such physical or mental*

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*abnormalities which may lead to being seriously handicapped*[3].

iii. *Any actual or reasonable foreseeable environment*[3].

Now here what is "actual or reasonable foreseeable environment" under Section 3(3) needs an elaboration? This is the gap of law which needs to be filled thorough medical research, because only the medical expert can give the best explanation here.

Regarding the gestational age for termination of pregnancy for all cases the maximum limit is 20 weeks where the opinion of two registered medical practitioners is needed and opinion of one registered medical practitioner is needed to terminate the pregnancy below 12 weeks.

Section 5 and 8 of MTP Act, protect doctor for any act which is done in good faith for the protection of mother life. But then also in numerous cases doctors refused to terminate the pregnancy and referred patients to apply before court. It might be because of the lack of knowledge of the Act and judgment passed by the Supreme Court relating to this Act.

## Material and Method

This research is purely doctrinal in nature. Researcher has used both Primary and secondary sources available for this research like Gazettes of India, Acts, Books, Journals, and Newspaper etc.

**Critical Study of the Upper Age Limit For Mtp Through Judgements**

Issues relating to gestational age will get cleared from the following judicial cases-

 ***Chandrakant Jayantilal Suthar v. State of Gujarat, 2016(4)RCR(Criminal)876***

This is a landmark judgment where Supreme Court has allowed termination of pregnancy of a minor rape victim even after 20 weeks of pregnancy.

 ***Kavita v. State of Haryana, 2015(2) RCR(Criminal)606***

**Question of Law:** Whether a 12-year-old rape victim will be allowed for medical termination of pregnancy in 34 weeks of pregnancy?

**Judgment-** The Court constituted two panels of specialists to look into the matter that whether terminating of pregnancy at 34 weeks constituted a crisis life-sparing measure under Section 5 of the MTP Act? The medical panels noticed that continuing pregnancy will not amount to any danger to a girl's life but it will be risky to do abortion at 34 weeks because the result will be the delivery of live baby. The Court did not take into account the termination of pregnancy but rather did express its sympathy for the rape survivor. In the light of this constrained pregnancy, the Court requested the clinic to furnish her with a private room, free medicinal services, and psychological well-being care administrations, and Rs. 2 lakhs to help her kid.

***Critical study-*** *This case raises the question in our mind that giving 2 lakhs compensation will be sufficient to compensate the victim for taking care of her baby. A girl who is just 12 years old and a victim of rape for her family whether it will not amount to mental torture to take care of the child of the rapist. Whether the family will take care of the girl child who is a victim of rape or the baby born to her? What will be the relation of the child with the family? How society will treat the child in such cases? How the family will overcome such ordeal? Who will be responsible for the ordeal of the family and for the upbringing of the unwanted child born forcibly from the rape? These entire questions need to be answered*.**.**

 ***R and Another v. State of Haryana 2016(3) RCR(Criminal)***

A girl was kidnapped from her friend's place and was then raped. The doctors, in this case, didn't perform MTP even after knowing that this is a case of rape and also there was a long procedural delay in the investigation. The victim was then left with no choice but to seek termination of pregnancy after 20 weeks. By the time she was 22 weeks pregnant. The High court directed to set a committee of doctors if the pregnancy could be terminated. The doctors reported that pregnancy would cause no harm to the victim and the MTP act does not allow terminating pregnancy beyond 20 weeks.

*The Court, in this case, ordered the government to provide Rs. 5000 to her each month and also urged the*

*doctors to provide her proper medical care and asked the state to deposit five lakh rupees in her account*.

Critical Study- *Whether the court has done justice with the girl by denying her the abortion right even after knowing that she is a victim of rape? Giving monthly expenses and compensation of 5 lakhs is sufficient? If this so then there is no need for the provision of Section 3 of MTP Act, 1971 which says that rape victims will be allowed to MTP under this act. These cases are examples to show that even after having the law; women were denied from their basic rights. This is the failure of the law to provide justice to the victim of a most heinous crime by denying them the abortion right.*

 ***Sonali Kiran Gaikwad vs. Union Of India, MANU/SCOR/43704/2017***

In this case medical termination of pregnancy was allowed in 28 weeks of pregnancy because the fetus was suffering from serious anomalies.

Thus, the recent judgment clearly indicates that pregnancy can be terminated even after the 20 weeks whether it's a case of rape or any other case ( e.g. Ms. X v. Union of India & Others AIR 2016 SC 3525). From the cases discussed above, it has been proved that termination of pregnancy can be safe even after 20 weeks. Also regarding the abnormality of the fetus, it is necessary to mention here that any abnormality of the fetus is known during 20 weeks of pregnancy as there are many tests which is conducted during 20 weeks of pregnancy like *TRIPLE MARKER TEST*[4]. So, in such a situation there is a need of amendment of the MTP Act where termination of pregnancy should be allowed even after 20 weeks.

COMPARATIVE STUDY OF THE MTP (AMENDMENT) BILL, 2020 WITH PAST MTP BILLS

The MTP Bill, 2020 as already discussed above, has suggested to increase the upper limit of MTP for rape victim upto 24 weeks and for fetal abnormities cases there will be no upper limit. Even the previous MTP (Amendment) Bill, 2014 has given the same suggestion relating to upper limit for abortion in fetal abnormalities cases means no upper limit for fetal abnormities cases[5].

*Now if we compare or study the MTP Bill of 2014 and MTP Bill of 2018 with MTP Bill of 2020 then we will find-*

- *That 2014, 2018 and 2020 Bills gives a wide power to doctors to terminate the pregnancy even after the upper limit for cases of fetal abnormalities.*
- *The MTP Bill, 2018 suggested to increases the upper limit for rape victim upto 27 weeks. But current Bill of 2020 has reduced the upper age limit for rape victim upto 24 weeks like that of MTP Bill of 2014.*
- *The MTP Bill, 2014 and the MTP Bill, 2020 are the only two bills which give the proposal to include the single unmarried women for MTP in parent Act.*

Another important point to mention here that in MTP Act, 1971 there is no such discrimination made between rape victims with fetal abnormalities cases related to upper age limit for MTP. ***But one can find the discrimination in terms of upper limit for termination of pregnancy for rape victims and for the cases of abnormalities of fetus in current MTP Bill, 2020. Now the question which arises here is that what is the need of such discrimination?***

ISSUES WHICH NEED TO BE HIGHLIGHTED

***1. Whether monetary compensation is enough for a rape victim whose right to abortion has been denied?***As already seen in the case of *Kavita v. State of Haryana, and R and Another v. State of Haryana* which raises the question in our mind that whether giving compensation will be sufficient to compensate the rape victim after denying her the abortion right for taking care of the baby born from the rapist. Taking care of the child is not a duty of one day or one year. It's a responsibility for a lifetime. The government failed to consider here about the financial and social situation of the family. Even about the future of the girl whose life has been vandalized due to rape at such a tender age or even if she is major the intensity of the pain will be same for the both. The situation here will be like that whom the family will care first, the girl child who is a victim of lady or the baby born to her? It will be like a mental torture for them to take care of the child of the rapist. Even it is also true that the child born from rape has no fault in it but it is also the bitter truth of the society that a child born from rape will never get the respect from the

society when the truth of the birth of the child will be known to all. Another issue here is about the relationship of the child with the family-like relationship with the victim's family and with the accused family? There is no clarity in it. Again who will be responsible for the ordeal of the victim family and for the upbringing of the unwanted child born forcibly from the rape? These entire questions need to be answered. Denying women for abortion right even after knowing that she is a victim of rape is injustice and violation of her Reproductive rights. Giving monthly expenses and compensation of a certain amount is not sufficient to solve the issues where abortion right is denied. If this so then there is no need of the provision of Section 3 of MTP Act, 1971 which says that rape victim will be allowed to MTP under this act. These cases are examples to show that even after having the law; women were denied to exercise her basic right. This is the failure of the law to provide justice to the victim of most heinous crime by denying them the abortion right.

Even it's the lacunae on the part of the legislative and judiciary system for not providing justice to the rape victim and even to the child born from this heinous crime. Their Right to privacy which is part of the Right to life with dignity under Article 21 of the Indian Constitution is grossly violated in such situations. Mother and child rights should be protected separately in such a way that their life and future get secured.

*There must be some rehabilitation or adoption center where the child born from the rape victim should be taken care but only for those cases where the court denied the rape victim for abortion and the child is unwanted.*

***2. Whether Fetus Right to Life is a Fundamental Right?***

After the above discussion now it is also important to know about the Right to Life of an unborn fetus, because one of the common reasons for denial of abortion right is to protect the life of the unborn child. Right to life is a fundamental right of all people in every part of the world. But conflict arises when question comes regarding Abortion right of a woman. Almost in all International Human Rights Law, Right to Life is protected after the birth and this is only because to protect the women's rights, it may amount to serious threat to women's rights to abortion, if the right to life before birth gets protected. Though States has a duty and right to protect the life of the unborn child too but not at the cost of mother life.

Actually no one can say exactly when human life begins. The medical and scientific community did not arrive at any conclusion that when human life begins. To understand this better first we have to know about the meaning of fetus and embryo. According to Springer pocket Dictionary, Gynecology embryo[6]means concept us developing inside the uterus up to the 85th day of pregnancy and fetus[6]means intrauterine child from the third month of pregnancy; prior to this embryo. From the definition it is clear that one can call an embryo to fetus from the third month of pregnancy i.e. after 12 weeks.

**DEFENCE BY INTERNATIONAL LAW FOR THE PROTECTION OF MOTHER LIFE**

Even according to "Article 1 of the Universal Declaration of Human Rights" states that "All human beings are born free and equal in dignity and rights[7]." Here the word born does not include fetus. So, Right to Life here will be for those who are born. Even the International Covenant on Civil and Political Rights (ICCPR) 1966, and The United Nations Convention on the Rights of the Child (UNCRC) 1990, speaks about the rights of children born and no reference is made regarding the rights of a fetus.

The Human Rights Committee in L.M.R. versus Argentina, UN Doc. CCPR/C/101/D/1608/2007, held that "the denial of a legal abortion for a rape victim inflicted physical and mental suffering, violating the woman's right to be free from torture or cruel, inhuman, or degrading treatment, and her right to privacy[8]".

In ***Vo versus France, (2005)40 EHRR 12***[8], where the European Court of Human Rights, interprets and monitors compliance with the European Convention affirmed that "the unborn child is not regarded as a 'person' directly protected by Article 2 of the Convention and that if the unborn do have a 'right' to 'life,' it is implicitly limited by the mother's rights and interests," including her rights to life, health, and privacy.

Even it was for the first time in India, during ***N. K. Sharma and Ors. versus Union Of India (UOI) and Anr***, question was arises that Whether MTP Act

infringes the Right to Life of a unborn child protected under Article 21 of the Indian Constitution? The Court in this case examined the Act and found that it aims is to save women's lives and to protect their mental and physical health. The Court recognized that there may be a debate about when a fetus "comes to life so as to attract Article 21," but concludes that a woman's life and health trump any concern for the fetus[9]".

Regarding the right to life of the fetus several courts has different opinion. Even neither Section 10 nor Section 11 of the IPC speaks about an unborn child. But Section 312-318 of IPC protects the life of unborn children in cases when miscarriage is done without the intention of protection of mother life.

From the above cases it's clear that Right to life started from birth and not before that so there is no point to deny the abortion right to women as this will amount to be violation of their reproductive right which is already discussed above.

Putting restriction on women for having legal abortion is indirectly forcing her to choose unsafe abortion which again may cause damage to her mental as well as physical health. In such situation whom we should blame, the women who choose the illegal methods for having an abortion or the law makers who failed to considered the pain of the lady?

**Conclusion and Suggestions**

The following are the suggestions-

1. Abortion right on demand to all women irrespective of marital status.

2. Increase of time limit for abortion as discussed above.

3. For those cases where abortion is not possible due to any reason then in such a situation, the Government should provide alternatives where the parents or rape victims can give the child for adoption immediately after birth.

4. More research is to be done in the field of gynecology and in law to find out the situation when a pregnancy can cause anguish to a women.

Apart from these suggestions, the issues which are highlighted here need to be answered separately by the judiciary and the legislature. All those points are social and legal issues. Giving compensation to rape victim for taking care of the rapist child is like a mockery of the law and it will be like social rape for her where she will be raped every day by the members of the society for giving birth to a rapist child. Emotionally it will be no less than a criminal rape, the only difference will be here is that here the rape will be done verbally by the judiciary and by the so-called members of the society reminding her about the ordeal that she is a victim of rape and she has given birth to a rapist child.

The purpose and object of the MTP Act will be fulfilled only when this law will be applicable to all women and abortion will be allowed on demand. *Legislative and Judicial interference is necessary but that should be limited when it comes to abortion right for a woman.*

**Conflict of Interest:** I have no conflict of interest**.**

**Source of Funding:** No funding for this research.

**Ethical Approval**: The study does not require the approval of Institutional Ethics Committee. As the study is the combination of socio-medico-legal issue. No field study is done for this research.

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# Effect of Kangaroo Mother Care on Physiological Parameters of Low Birth Weight Babies Admitted in NICU

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## Abstract

**Background:** Neonatal mortality is often associated with low birth weight (LBW) which is a common problem in India. Kangaroo Mother Care (KMC) is a special method of providing care to low birth weight babies where skin to skin contact is provided by placing a low birth weight (LBW) baby vertically between mother's breasts. The aim of the study is to assess and compare the effectiveness of Kangaroo Mother Care on Physiological Parameters of the LBW babies who were admitted in NICU of MMIMS&R hospital of Haryana.

**Materials and Method:** Quasi experimental one group pre test post test design was conducted. Total 30 LBW babies (<2000gm) were selected through purposive sampling. KMC was provided for one hour, three sessions per day for three consecutive days. The physiological parameters were assessed and compared on radiant warmer and immediately before, during and after KMC for 3 consecutive days.

**Results:** Findings of the study showed the statistical differences before and after the implementation of KMC. The comparison of physiological parameters (temperature, respiratory rate. heart rate and $SpO_2$) means under radiant warmer and during KMC showed significant difference ($p \leq 0.05$) on day 1, day 2 and day 3.

**Conclusions:** This study showed statistically significant difference in physiological parameters on all three days. Thus, KMC was found to be effective method in maintaining the stability of physiological parameters of low birth weight babies.

***Key Words**: Kangaroo Mother Care, Physiological Parameters. Low Birth Weight Babies*

## Introduction

The first 28 days of life – the neonatal period –are the most vulnerable time for a child's survival. The level of low birth weight in developing countries (16.5%) is more than double the level in developed regions (7 %). LBW is considered as the single most important predictor of infant mortality, especially of deaths within the first months of life. A baby's low weight at birth is either the result of preterm birth (before 37 weeks of gestation) or restricted fetal (intrauterine) growth.[1]

Preterm birth (born before 37 weeks of pregnancy) face many challenges to maintain their physiological parameters in extra uterine life which may lead to many complications.[3]

Thus, preterm infants need supplementary energy for the maintenance of stable physiological parameters, warmth, feeding, and to be infection free in their postnatal life. The insufficiency of thermal security is still a large scale threat for newborn survival in developing

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countries. Kangaroo Mother Care (KMC) is one of cost effective intervention which is very easy but more powerful method to reduce many complications mainly in low birth weight babies. Indian data on outcome of KMC are limited, though it has been found to be an effective and feasible method of care of LBW babies in hospital setting. [5] T hus researcher decided to conduct a study aimed at determining the impact of KMC on physiological parameters of LBW babies.

## Methodology

This quasi-experimental study, one group pre test post test design was conducted on 30 low birth weight babies admitted in NICU of Maharishi Markandeshwar Hospital Mullana Ambala. The sampling technique used was purposing sampling. The inclusion criteria were Low birth weight babies who were being nursed under radiant warmer and were hemodynamically stable Low birth weight babies(<2000g). Study excluded LBW babies having any severe life threatening respiratory, nervous, and circulatory and congenital anomalies and babies whose mothers do not consent for study.

In order to get the data, clinical profile of the LBW babies including gestational age, chronological age, birth weight, gender, mode of feeding and type of feed was used mothers were instructed about the procedure and taken informed assent. KMC was provided in three sessions each of one hour for three consecutive days. Physiological parameters (Axillary temperature, respiration rate (RR/ min), heart rate (HR/ min), and oxygen saturation(SpO2))were recorded in three observations on radiant warmer before each session of KMC and also three observations of physiological parameters were monitored and recorded during each session of KMC for three consecutive days.

### Procedure

For implementing KMC, mothers were asked to use any front open light dress. Babies were dressed with cap, socks, and nappy and no other garments. After placing into a custom-made KMC bag, the baby was placed upright inside mother's clothing against bare skin of the chest and abdomen. Head was turned to one side and placed in a slightly extended position and eye to eye contact between mother and baby was encouraged. The hips were kept flexed and abducted in a ′frog′ position; the arms were also flexed. Counseling and demonstration were repeated for initially hesitant mothers till they were able to offer KMC confidently and correctly.

To measure the temperature, digital thermometer was used. the temperature was recorded in ◦C. Heart rate and SpO2 were recorded by using Pulse oximeter. Respiration was assessed by recording chest expansion and relaxation.

**Ethical considerations :** The ***ethical clearance*** was obtained from university research ethics committee of Maharishi Markandeshwar Deemed to be University Mullana, Ambala (MMDU/IEC/967). Informed consent was obtained from the mothers of Low birth weight babies.

## Results

The analysis was done by applying parametric tests after checking normalcy of the data by Shapiro Wilk Test. Descriptive and inferential statistics were utilized for data analysis. p value $\leq 0.05$ was considered as significant for the present study. the paired 't' test was used to compare the means of vital signs on radiant warmer and during KMC. One way ANOVA was used to test the associations with selected variables of LBW babies. Complete data was available of 30 low birth weight babies were recruited at the level of 0.05 level of significance.

The results of the study showed that more than half of the Low birth weight babies (63.3%) were preterm, with chronological age between 5-10 days . Less than half (43.3%) weighed in between 1800-2000grams birth. Most of them were females (60%) and more than half (56.7%) were on

nasogastric/orogastric feeding and less than three fourth (73.3%) were getting expressed breast milk. [Table 1].

The comparison of the Physiological parameters between means on radiant warmer and during KMC on three consecutive days in three sessions per day showed statistically significant difference using the paired 't' test which showed that the Physiological parameters (Temperature, Heart Rate, Respiratory Rate & SpO2 ) of LBW babies was more stable during KMC than on Radiant warmer (RW).($p \leq 0.05$)[Table2,3,4,5] on 1st ,2nd and 3rd day respectively which indicates that the stabilization of physiological parameters during KMC in low birth weight babies was true difference and not by chance, suggesting that KMC was effective in stabilizing the temperature of low birth weight babies.

**Table 1: Frequency and Percentage Distribution of characteristics of LBW babies.**

| Sr.no | Sample characteristics | Frequency% |
|---|---|---|
| **1** | **Gestational age** | |
| 1.1 | Term/Small for date | 11(36.7%) |
| 1.2 | Preterm | 19(63.3%) |
| **2.** | **Chronological age** | |
| 2.1 | <5 days | 2(4.4%) |
| 2.2 | 5-10 days | 19(63.3%) |
| 2.3 | > 10 days | 9(30%) |
| **3.** | **Birth weight** | |
| 3.1 | 1800-2000gm | 13(43.3%) |
| 3.2 | 1200-1799gm | 11(36.7%) |
| 3.3 | <1200gm | 6(20%) |
| **4** | **Gender** | |
| 4.1 | Boy | 12(40%) |
| 4.2 | Girl | 18(60%) |
| **5** | **Mode of feeding** | |
| 5.1 | Breastfeeding | 4(13.3%) |
| 5.2 | Nasogastric/orogastric feeding | 17(56.7%) |
| 5.3 | Paladai/cup feeding | 9(30%) |
| **6** | **Type of feed** | |
| 6.1 | Expressed breast milk | 22(73.3%) |
| 6.2 | Formula milk | 8(26.7%) |

**Table 2: Determining and Comparing the Temperature average on Radiant Warmer (RW)and during KMC on day 1, day 2 and day 3 of KMC.**

| TEMPERATURE (°C) | | | Mean | MD | SE MD | 't' value | p value |
|---|---|---|---|---|---|---|---|
| DAY 1 | Session I | RW | 36.67 | .33 | .088 | 3.80 | .001** |
| | | KMC | 37.00 | | | | |
| | Session II | RW | 36.53 | .43 | .10 | 4.17 | .000** |
| | | KMC | 36.97 | | | | |
| | Session III | RW | 36.77 | .26 | .08 | 3.24 | .003* |
| | | KMC | 37.00 | | | | |
| DAY 2 | Session I | RW | 36.67 | .33 | .08 | 3.8 | .001* |
| | | KMC | 37.00 | | | | |
| | Session II | RW | 36.7 | .61 | .09 | 1.72 | .002* |
| | | KMC | 36.09 | | | | |
| | Session III | RW | 36.53 | .46 | .09 | 5.03 | .000* |
| | | KMC | 37.03 | | | | |
| DAY 3 | Session I | RW | 36.5 | 0.5 | .05 | 1.79 | .001* |
| | | KMC | 37.0 | | | | |
| | Session II | RW | 36.73 | .63 | .10 | 1.54 | .003* |
| | | KMC | 37.1 | | | | |
| | Session III | RW | 36.77 | .30 | .08 | 3.52 | .001* |
| | | KMC | 37.07 | | | | |

t(29)≥2.045 NS -Not significant(p>0.05) *significant (p ≤ 0.05)

**Table 3: Determining and Comparing the Respiratory Rate average on Radiant Warmer and during KMC on day 1, day 2 and day 3 of KMC.**

| RESPIRATORY RATE | | | Mean | Mᴅ | SE Mᴅ | 't' value | p value |
|---|---|---|---|---|---|---|---|
| DAY 1 | Session I | RW | 45.83 | 2.86 | .07 | 3.84 | .001* |
| | | KMC | 42.97 | | | | |
| | Session II | RW | 42.20 | 2.36 | .81 | 2.92 | .007* |
| | | KMC | 39.83 | | | | |
| | Session III | RW | 41.43 | 2.33 | .91 | 2.56 | .016* |
| | | KMC | 39.10 | | | | |
| DAY 2 | Session I | RW | 45.80 | 3.60 | .69 | 5.19 | .000* |
| | | KMC | 42.20 | | | | |
| | Session II | RW | 41.50 | 1.80 | .87 | 2.06 | .048* |
| | | KMC | 39.70 | | | | |
| | Session III | RW | 42.20 | 2.53 | .89 | 2.99 | .006* |
| | | KMC | 39.57 | | | | |
| DAY 3 | Session I | RW | 45.87 | 2.53 | .80 | 3.16 | .004* |
| | | KMC | 43.33 | | | | |
| | Session II | RW | 42.63 | 2.76 | .90 | 3.07 | .005* |
| | | KMC | 39.87 | | | | |
| | Session III | RW | 41.17 | 1.96 | .96 | 2.04 | .050* |
| | | KMC | 39.20 | | | | |

t(29)≥2.045 NS -Not significant(p>0.05) *significant ($p \leq 0.05$)

**Table 4: Determining and Comparing the Heart Rate average on Radiant Warmer and during KMC on day 1, day 2 and day 3 of KMC.**

| RESPIRATORY RATE | | | Mean | Mᴅ | SE Mᴅ | 't' value | p value |
|---|---|---|---|---|---|---|---|
| DAY 1 | Session I | RW | 45.83 | 2.86 | .07 | 3.84 | .001* |
| | | KMC | 42.97 | | | | |
| | Session II | RW | 42.20 | 2.36 | .81 | 2.92 | .007* |
| | | KMC | 39.83 | | | | |
| | Session III | RW | 41.43 | 2.33 | .91 | 2.56 | .016* |
| | | KMC | 39.10 | | | | |
| DAY 2 | Session I | RW | 45.80 | 3.60 | .69 | 5.19 | .000* |
| | | KMC | 42.20 | | | | |
| | Session II | RW | 41.50 | 1.80 | .87 | 2.06 | .048* |
| | | KMC | 39.70 | | | | |
| | Session III | RW | 42.20 | 2.53 | .89 | 2.99 | .006* |
| | | KMC | 39.57 | | | | |
| DAY 3 | Session I | RW | 45.87 | 2.53 | .80 | 3.16 | .004* |
| | | KMC | 43.33 | | | | |
| | Session II | RW | 42.63 | 2.76 | .90 | 3.07 | .005* |
| | | KMC | 39.87 | | | | |
| | Session III | RW | 41.17 | 1.96 | .96 | 2.04 | .050* |
| | | KMC | 39.20 | | | | |

t(29)≥2.045 NS -Not significant(p>0.05) *significant ($p \leq 0.05$)

**Table 5: Determining and Comparing the SpO2 average on Radiant Warmer and during KMC on day 1, day 2 and day 3 of KMC.**

| HEART RATE(b/min) | | | Mean | Mb | SE Mb | 't' value | p value |
|---|---|---|---|---|---|---|---|
| DAY 1 | Session I | RW | 151.23 | 14.00 | 12.48 | 1.08 | .000* |
| | | KMC | 137.23 | | | | |
| | Session II | RW | 136.37 | 3.80 | 2.42 | 5.65 | .000** |
| | | KMC | 132.57 | | | | |
| | Session III | RW | 135.07 | 4.33 | 2.01 | 3.82 | .001* |
| | | KMC | 130.73 | | | | |
| DAY 2 | Session I | RW | 135.45 | 1.96 | .80 | 3.47 | .002* |
| | | KMC | 133.50 | | | | |
| | Session II | RW | 134.20 | 3.29 | 1.45 | 3.70 | .001* |
| | | KMC | 130.97 | | | | |
| | Session III | RW | 132.20 | 2.50 | 0.82 | 3.05 | .005* |
| | | KMC | 129.70 | | | | |
| DAY 3 | Session I | RW | 133.77 | 1.13 | 2.64 | 1.53 | .13 NS |
| | | KMC | 134.90 | | | | |
| | Session II | RW | 134.10 | 2.43 | 1.33 | .50 | .000** |
| | | KMC | 131.67 | | | | |
| | Session III | RW | 133.37 | 3.93 | 1.46 | 3.25 | .003* |
| | | KMC | 129.43 | | | | |

t(29)≥2.045 NS -Not significant(p>0.05) *significant (p ≤ 0.05)

## ❖ UNITS USED

◦C. DEGREE CELCIUS

## ❖ ABBREVATIONS USED

1. KMC: KANGAROO MOTHER CARE
2. LBW: LOW BIRTH WEIGHT
3. RW: RADIANT WARMER
4. NICU: NEONATAL INTENSIVE CARE UNIT
5. RR: RESPIRATORY RATE
6. HR: HEART RATE

## Discussion

The study results showed a significant increase in the average temperature in the LBW babies in the 1st to 3rd days after KMC, the findings are consistent with the results of many studies in

this regard. Only a study, before and after, showed that the newborns temperature reduced during KMC compared to the incubator care, although the temperature rates were in the normal range. Sontheimes et al . showed that even in newborns transferring with KMC compared to incubator care, the HR, respiratory rate, arterial oxygen saturation rate, and the temperature remain constant.[6] Hence, we can say that the KMC leads

to the temperature stability or its increase in the normal range. Indeed, putting the newborn in skin contact with the mother will prevent the heat loss. Increasing temperatures, particularly for low birth weight and premature newborns with tendency to hypothermia is very useful and improves the treatment outcomes, while the metabolic rate and oxygen consumption increase with the heat loss and lead to physiological and metabolic instability, homeostatic problems, apnea intensifying, and impaired weight gain.[7]

The research results showed a significant increase in oxygen saturation rate during the 1st to 3rd days after KMC compared to radiant warmer which is consistent with the results of many studies. Increase in arterial oxygen saturation rate can be due to calm and comfortable contact of the newborn with the mother and possibly the reduced oxygen consumption.[8]

In a number of clinical trial studies on similar preterm subjects, no changes have been reported in the rate of arterial oxygen saturation during KMC. Furthermore, in a study, no change was observed in the rate of arterial oxygen saturation in preterm neonates on heel prick and during puncturing the heel stick during the KMC than to the incubator cure.

Some researchers mentioned that during neonatal transportation toward the KMC, SpO2 may decrease, statistically, but not clinically, significant and will become normal within three minutes of KMC. Nonetheless, head in upright position is important to maintain the oxygen saturation[9].

The findings of the present study were also found to be consistent with the study conducted by Dr. Deepa.S.Phirke, Dr Sudhakar Bantewad to evaluate the effect of KMC on low birth weight babies, where the change in temperature ranged from -2 to +2oF and 78 babies had increased in temperature. The change in heart rate (HR) ranged from 3 to 12 beats/min.73 babies had decreased heart rate. The range of change in respiratory rate (RR) was 3 to 8 per minute. Total 75 babies had a decreased RR. The change in SPO2 was 3 to 8 and total 78 babies showed an increase in the SPO2. The mean of HR was 146.95 and 139.55, For RR 45.96 and 40.175, for temperature 97.69 and 98.50 and was 93.55 -97.48 for SPO2 before and after receiving KMC respectively .P value was <0.0001 in all parameters.[10]

## Conclusion

The results of the study concluded that that the KMC contributes in stabilizing the physiological parameters (the temperature, cardiovascular and respiratory stability) of LBW babies.

**Recommendations:**

· A study to evaluate the effectiveness of KMC on high risk newborn in terms of neurobehavioral outcomes.

· A follow up study can be conducted to assess the long term effects of Kangaroo mother care.

· A qualitative study can be conducted to assess the barriers faced by nurses and mothers in implementation of KMC.

· A exploratory study can be conducted to find out the prevalence and duration of KMC practice in the selected hospitals of Haryana.

· A comparative study can be conducted to assess the effectiveness of KMC versus coconut oil massage on multiple variables for viz. Stability of physiological parameters, weight gain, sepsis, feeding behavior, apnea, duration of stay in hospital etc.

A mixed approach study can be conducted on impact of frequency and duration of KMC on maternal and neonatal outcomes of LBW babies.

**Limitations:**

The study is confined to a small number of sample. This limit the generalization of the findings to study samples only.

Monitoring of physiological parameters during KMC .Researcher must had let the mothers and baby undisturbed during KMC sessions.

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# Perception of Medication error among Interns and Staff Nurses in a Selected Hospital at Mangaluru- A Mixed Method Approach

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## Abstract

**Objectives:** The present study assessed the perception of medication error among the Interns and Staff Nurses and also elicited the experiences of those who have witnessed or committed medication error.

**Method:** A mixed method approach was adopted, and by Purposive sampling technique, 50 Interns and 50 Staff Nurses were selected as participants. The initial Quantitative Phase Data was obtained by using Demographic proforma, and Modified Gladstone scale of medication error. Qualitative Phase data was collected by Semi-Structured open-ended Questionnaire.

**Result:** The findings of Descriptive and Inferential statistical analysis revealed that Majority of the Staff nurses had High Perception (52%) and Interns had Moderate perception (68%) about the medication error. Staff nurses (51.14) perception of medication error was higher than that of Interns (46.70). In the second phase Qualitative data was collected by Semi-Structured open-ended Questionnaire, and the verbatim was analyzed by Colaizzi's data analysis. With the verbatim, six themes emerged, which are Patient safety threat, Physical and physiological effect, Handling the error, reporting attitude, negative emotions, and problem focus strategy of medication error. The triangulation of Qualitative and Quantitative findings revealed the congruency between the four domains like causes, types, reporting behavior, and Views or feelings on medication error.

**Conclusion:** The study identified the gap between the nurse's perception of medication error with their actual knowledge. It was clear that the nurses need specific information about what constitutes medication error.

***Key Words:*** *Medication Errors, Perception, Health Personnel, Patient safety*

## Introduction

In the healthcare system, advancements and Errors are an all-time high happening. The system of treatment is becoming more hi-tech and more sophisticated, which is vulnerable to errors at the same time.[1] If wrong medicine is administered, it can cause severe adverse reactions instead of cure. A medication error is a significant threat to the patient's safety. It is the most frequent error occurring in the health care set up due to the negligence or malpractice of the health care professionals, who involve in the direct patient care such as Nurses, Doctors, and the Pharmacists which lead to the harmful effects on the patients .[1]

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India records around 5.2 million injuries due to the medical errors of which medication error is one of them.[2] According to the Food and Drug Administration, in the United States, about 1.3 million people have been injured annually due to the medication error.[3]

An Indian study conducted on the medication error in a general hospital of Bangalore; Karnataka, revealed that the incidence of medication error was 38.12%.[4] Another study conducted in a tertiary care teaching hospital of Gulbarga, Karnataka, revealed that the incidence of medication error was 33.4%.[5] Hence it was found that medication error is the most common and severe problem that occurs in the hospital due to the various causes.

Nurses play an influential role in preventing, identifying, and reporting medication error. Despite the medication error, some nurses fail to report the error because of their perceived barrier. Nurse's perception should be changed to prevent medication error by enhancing their knowledge regarding the safe practices of medication administration. Nurses are the line of defense for patient's safety in administering medication, detecting and managing errors during the patient care. There is a lack of statistics about the medication error as the committed persons do not report it. The present study aimed to assess the perception of medication error among the Interns and Staff Nurses and also to elicit the experience of health personnel who had witnessed or committed medication error so that the corrective actions can be taken to prevent future errors thus increasing the patient's safety.

## Materials and Method

A Mixed method approach with sequential exploratory design (Phase I- Quantitative followed by Phase – II Qualitative) was adopted. In this study, health personnel refers to staff nurses and nursing interns. The required permissions were obtained from the hospital authorities.GNM and B.Sc (N) Interns who are undergoing internship and Staff nurses who are involved in direct patient care were included for the study.50 Staff nurses and 50 Nursing interns working in all the wards were selected by purposive sampling technique in Phase I. Informed written consent was taken from the participants. Ward in-charges, supervisors, M.Sc qualified nurses and Nurses working in the Hospital for less than 1 Year and those under supervision were excluded. In phase II focussed group discussion was held to obtain qualitative findings from the few Nurses who had witnessed or committed medication error.

**Data collection tools:**

The quantitative data was collected by demographic proforma and modified Gladstone scale of medication error in Phase I and Semi-Structured open-ended questionnaire in phase II.

**Demographic Proforma:**

It consisted of 14 items, which includes age, gender, Education, working area, years of experience, work experience in other hospital, number of patients handled, Practice of basic rights, Medical Professional in the family, Previous Knowledge, facilities to gain knowledge, training during initial days of internship, medication administration without supervision, witnessed medication error and committed Medication error.

**Modified Gladstone Scale of Medication error:**

This scale initially was developed by Jill Gladstome (1995) [6] and the researcher obtained permission to use and modify it for the present study. Items were categorized into four domains, such as Causes, Types, Reporting Behaviour, and Views/ Feelings with a maximum score of 75. The overall score of all four domains was calculated and interpreted as Low Perception 1-25, Moderate Perception 26-50, and High Perception 51-75.

The Semi-Structured open-ended Questionnaire had six questions entailed of experience of a medication error, consequences, managing, reporting, emotional changes, and coping strategies adopted after a Medication error.

Nine subject experts of nursing tested the content validity and relevance of the questionnaire. By using "Cronbach's alpha," the reliability of the tool was measured and was found adequate for the study (0.75).

**Quantitative data analysis:** Descriptive statistics (Frequency, Percentage, Mean, Mean Difference, and Standard Deviation) and inferential statistics were used for the analysis of quantitative data. Independent t-test was used to compare the perception of medication error among the Interns and Staff Nurses and Chi-square test

to find out the association between the level of perception with selected demographic variables). Significance level was considered at $p < 0.05$.

**Qualitative data analysis:** The written verbatim of the Staff nurses who have either witnessed or committed medication error was analyzed using "Colaizzi's data analysis framework, and themes and sub-themes were emerged. The themes were validated by two experts in the field of qualitative research.

**Triangulation of data:** Triangulation of data is the merging of quantitative and Qualitative data. The congruent findings from the Phase I Quantitative (Collected with Modified Gladstone scale) and the Phase II-Qualitative (written verbatim) were analyzed and merged to derive a common conclusion.

## Findings

Majority of the Nurses and interns were in the age group of 20-25 years and completed (54%) diploma in Nursing education.Most (64%) of the staff nurses had 1-3 years of experience,and 52% of the staff nurses handle 7- 11 patients during a shift. Table 1 presents descriptive characteristics of Staff Nurses and Interns.

**TABLE NO: 1 DISTRIBUTION OF SUBJECTS ACCORDING TO THE DEMOGRAPHIC CHARACTERISTICS** n = 100

| Characteristics | Interns | Staff Nurses | Percentage |
|---|---|---|---|
| Age | | | |
| 20-25 | 50 | 19 | 69 |
| 26-30 | 0 | 25 | 25 |
| 31-35 | 0 | 6 | 6 |
| Education | | | |
| GNM | 25 | 29 | 54 |
| B.Sc (N) | 25 | 15 | 40 |
| P B B.Sc (N) | 0 | 6 | 6 |
| Currently working | | | |
| Medical | 11 | 12 | 23 |
| Surgical | 10 | 16 | 26 |
| ICU | 10 | 6 | 16 |
| Paediatric | 5 | 5 | 10 |
| OBG | 10 | 7 | 17 |
| Casualty | 4 | 4 | 8 |
| The practice of 10 basic rights of drug administration | | | |
| Yes | 33 | 46 | 79 |
| No | 17 | 4 | 21 |
| Witnessed medication error | | | |
| Yes | 10 | 19 | 29 |
| No | 40 | 31 | 71 |
| Committed medication error | | | |
| Yes | 0 | 1 | 1 |
| No | 50 | 49 | 99 |

Figure 1 represents the Interns Perception of medication error where majority 46% had moderate level of perception about the causes of medication error, 58% had moderate level of perception about the types of medication error, 64% had a low level of perception about the reporting behavior of medication error, 60% had a Moderate level of perception about the Views/ feelings of medication error.

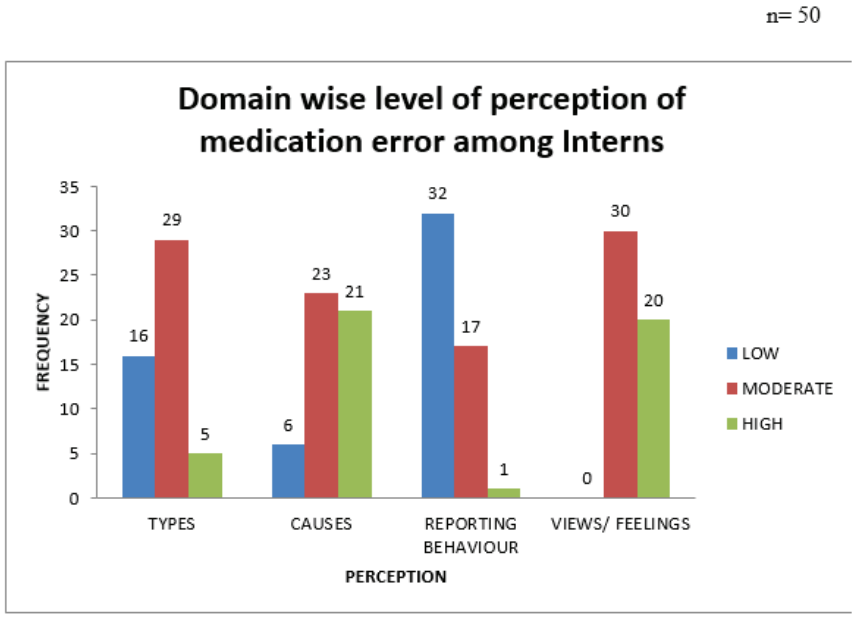


**Fig No 1: Bar diagram representing domain wise level of perception of medication error among Interns**

Figure 2 represents the Staff nurses Perception of medication error which depicts that majority 50% had moderate level of perception about the causes of medication error, 54% had moderate level of perception about the types of medication error, 52% had low perception about the reporting behavior of medication error and 84% had high level of perception of the Views/ feelings of medication error.

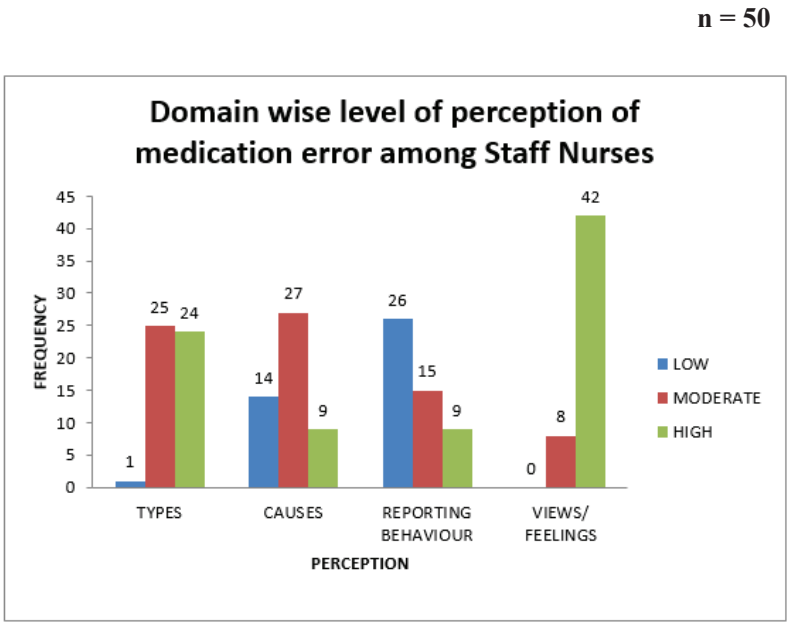


**Fig No 2: Bar diagram representing domain wise level of perception of medication error among Staff nurses**

From the error bar diagram ( Figure 3) it is clear that among the Staff nurses and Interns, the level of mean perception about medication error was 51.14±6.65 and 46.7±9.6.

**n= 100**

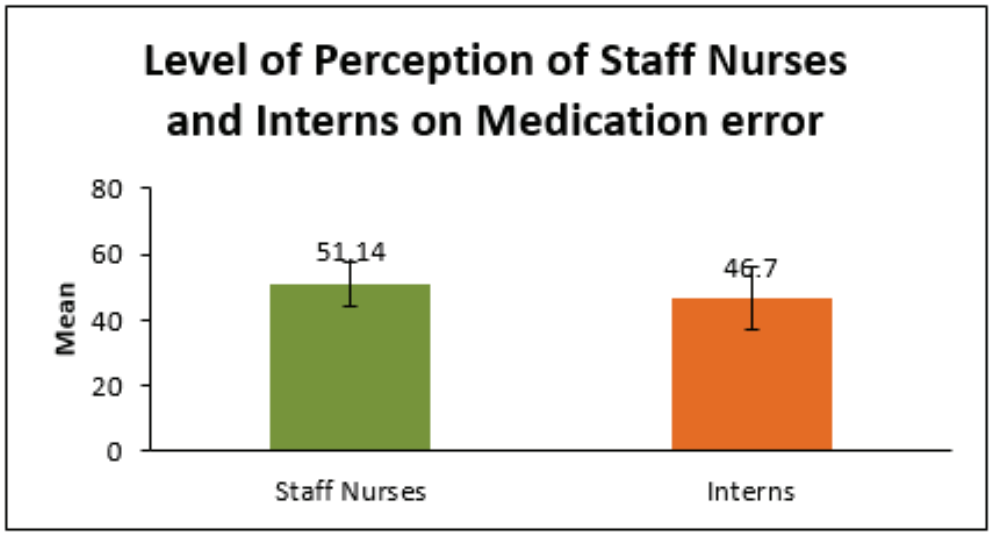


**Fig no 3: Error bar diagram representing the mean and standard deviation of staff nurses and Interns level of perception of medication error**

The independent sample 't' test calculated value is 2.68, with the p-value of 0.009, which is less than 0.05. Hence the research Hypothesis is accepted, and it is concluded that there is a difference in the overall perception of medication error between the staff nurses and interns at a 5% level of significance. (Table no. 2). There is no significant association found between the Interns and staff nurses level of perception with the selected demographic variables at a 5% level of significance.

**TABLE NO 2: COMPARISON OF THE LEVEL OF PERCEPTION AMONG INTERNS AND STAFF NURSES**

**n = 100**

| Level | Group | Mean difference | 't' | P value |
|---|---|---|---|---|
| Over all Perception | Interns | 4.440 | 2.68 | 0.009* |
| | Staff nurse | | | |
| Causes | Interns | 0.70 | 0.67 | 0.504 |
| | Staff nurse | | | |
| Types | Interns | 0.460 | 1.64 | 0.104 |
| | Staff nurse | | | |
| Reporting | Interns | 0.50 | 1.821 | 0.072 |
| | Staff nurse | | | |
| Views/ Feeling | Interns | 2.780 | 3.981 | <0.001* |
| | Staff nurse | | | |

* indicates significant

The findings of the study revealed that there was no significant association between the staff nurses and Interns

level of perception with the selected demographic information.

An attention-grabbing finding found is that 10 Interns and 20 Staff Nurses had witnessed or committed medication error. Those were asked to write in-depth about the medication error experiences based on the Semi-Structured open-ended questionnaire. The verbatim of the Interns and Staff nurses was analyzed and found that 10 Interns Verbatim was inadequate. Therefore 20 Staff Nurses Verbatims were selected for the In-depth Qualitative analysis.

Based on the staff nurses verbatim, six main themes were derived. They are patient safety threat, impact and severity, strategies adopted, reporting attitude, psychological effect and problem focus strategy.

- **Patient safety threat** theme was derived from the three subthemes such as communication error; failure to adhere to the rights of medication administration and nurse's dereliction to the duty.

- **Impact and severity** was derived from the physical and physiological effects of medication error such as no harm, minor adverse effects, major adverse effects and life threatening.

- **Strategies adopted** was derived from the ways of handling error such as reporting the error, monitoring the patient, symptomatic error, antidote administration and transferring the patient to ICU.

- **Reporting attitude** was derived from the subtheme of positive and negative attitudes.

Positive attitude were following the correct Hierarchy of reporting (Doctor, NS, Quality assurance department), reporting through the incident form and reporting the error to the patient and patient relatives. Negative attitude such as not reporting the error to anyone, nurses think that the error was not serious to report, hiding the error with support, reporting the error only to the Doctor, not disclosing the error to the patient or patient relatives and disclosing the error to the patient due to the death of the patient.

- **Psychological effect** was derived from primary and secondary negative emotions of the staff nurses after the medication error. Primary negative emotions were scared, anxious, stress, upset, worried, crying, embarrassment, guilty. Secondary negative emotions were fear of getting scolding, fear of retaliation, fear of paying penalty and fear of losing job.

- **Problem focus strategy** was derived from the various defence mechanism adopted by the nurses. They are adaptive coping strategies such as understanding the responsibility, seeking help from Doctor, discussing with peers and carry out remedial measures quickly and mal adaptive coping strategies were blaming others, Self isolation and avoiding peers, trying to manipulate and ignoring the mistake done.

For the Triangulation of the Data, findings of the Quantitative phase (50 Staff nurses) and the Staff Nurses Verbatim (19 Witnessed and one committed medication error) of the qualitative phase have been merged, and a matrix developed.

In the modified Gladstone scale, 12 items of causes of medication error were compared with the qualitative findings of the Staff nurses. Out of which, five causes were similar with 7 participants verbatim of the qualitative findings namely patients with similar names, failure to check the IP number, incorrect setting of the infusion device, illegible handwriting of the doctor in the prescription chart, and received verbal or telephonic orders.

Regarding types of medication error, which contains six items, two were coinciding with that of the four staff nurses verbatim. They were Wrong dose error and the deteriorated error.

Among the Six items of the reporting behavior, three items of the scale were corresponding with eight nurses verbatim of the qualitative findings. Those are staff nurses report medication error immediately, failure to follow the correct hierarchy of reporting (Doctors, Nursing superintendent, and quality assurance department) and failure to report error through the incident form.

Another interesting finding to note is that 4 Perceived barriers of medication error were coinciding with 14 participants verbatim of the qualitative findings like failure to report due to the reaction from the authority and others; nurses think that the error was not serious to report, fear of disciplinary action, loss of job and they

think that it is safe not to report to patient relatives in some situations.

## Conclusion

The study result findings state that the work experience plays an important role in committing any kind of error in a hospital setup. As the age increases the clinical experiences also improves and makes the nurses more mature thereby, they may be more cautious to avoid all chances of committing the mistakes and errors.

The results attribute to a salient point that, medication error is the most common error in the hospital which varies with the severity, and the most strong point is that the causes of medication errors are preventable. During the induction training, all the nurses and interns should be provided with an equal opportunity to familiarize with hospital policies in medication administration and standing orders related to medication administration.

The medication error is not only a local or regional issue; it has a global impact where the errors seem to be silly but have a huge implication in the patient's life. If it is not identified early and counteractions were not initiated at the earliest, it may cost the life of the patient. However, these errors can be completely avoidable if the care provider or nurse shows alertness and mindfulness. Shortage of workforce and workload of individual nurses patient care settings may be the hindering factor leading to lethargic environment, which need to be addressed at the administrative level.

The researcher felt that there was a gap between the perception of medication error and the actual knowledge of the staff nurses and Interns. Fear of the nurse manager and loss of job was the strongest barrier found in reporting the medication error. These findings emphasize the importance of developing a rational blameless climate for honest reporting of the intended or unintended medication errors and using those reports for improving patient safety.

**Conflict of Intrest:** None

**Source of Funding:** Self

**Ethical Clearance:** The research proposal was placed in the Institutional ethics committee and obtained permission.(NUINS/CON/NU/IEC/ 2015-16 dated 16/01/2016).

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# Knowledge of Antenatal Mothers Regarding Human Milk Banking

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## Abstract

**Introduction: Background**: Breast milk is the perfect food and uniquely superior to, artificial baby milk. Giving a child breast milk from another woman is not a newer concept; wet nursing was a fairly common practice a few decades ago. Human milk banks are services which collect, screen, process and distribute donated breast milk. Current research evidences suggest that pasteurized donor human milk can provide many of the components and eliminate the risk of transmission of infectious agents.

**Method:** Quantitative research approach was adopted to assess the knowledge on Human Milk Banking; a structured knowledge questionnaire was given to100 antenatal mothers. The study was conducted at Justice K.S Hegde charitable Hospital. Descriptive survey design was adopted to accomplish the objectives.

**Results:** Findings revealed that 52% of mothers had good knowledge and remaining mothers had an average knowledge. The 'p' value of age with regards to knowledge on human milk banking is 0.099, whereas the 'p' value of parity is 0.718. Meanwhile the 'p' value of family is 0.213 and that of religion is 0.428. For education, occupation, income and any previous exposure with human milk banking the 'p' values were 0.284, 0.082, 0.104 and 0.750 respectively. The above results shows that for all the demographic characteristics, the 'p' value is >0.05. Hence it was found that there was no significant association between knowledge of antenatal mothers with selected demographic variables.

**Conclusion:** Providing knowledge to antenatal mothers on human milk banking serve as an investment for the future needs. The nurse practitioner has a primary responsibility of enhancing the knowledge and developing positive attitude, towards utilization of human milk banking.

***Keywords:*** *Knowledge, Antenatal Mothers, Human Milk Banking, Information Booklet.*

## Introduction

Breast milk is the perfect food for human infants. It is markedly different from, and uniquely superior to, artificial baby milk[1]. Wet nursing was fairly common practice few decades ago. Human milk banks play an essential role by providing human milk to infants who would otherwise not be able to receive human milk. Human milk protects premature infants from necrotizing enter colitis and from sepsis, two devastating medical conditions. Milk banks collect, screen, store, process, and distribute human milk. Donating women usually nurse their own infants and have a milk supply that exceeds their own infants' needs[2]. Breast milk is the main source of food for the baby, which is necessary for its growth and development[3]. Every mother looks forwards for a healthy baby. Breastfeeding also allows mother and baby to bond emotionally.

WHO Recommended exclusive breastfeeding for first 6months and continue till two years of age along with weaning4. In some instances the mother may pass away soon after delivering, mother maybe having infectious diseases or the mother is not able to produce sufficient milk. Unfortunately the baby may not get the mother's breast milk and thus the basic needs couldn't

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be meet. In such cases the human milk bank plays a vital role. The human milk bank is a service which collects, screens, crosses and dispenses human milk[5].

**Background of the study**

The world's first human milk bank was founded in 1909 in Vienna, Austria6. After Vienna, the first human milk bank opened in the United States in the Boston Floating Hospital. In the 1960s, efforts in human milk bank faded due to advances in neonatal medical care and infant nutrition. Human milk banks are services which collect, screen, process and distribute donated breast milk. Recipients are generally ill and premature infants whose mothers are unable to breastfeed them. As survival rates for preterm infants improve, more attention is being focused on improving the quality of survival through optimal nutritional management. WHO and UNICEF, made a joint statement in 1980: "where it is not possible for the biological mother to breast feed, the first alternative, if available, should be the use of human milk from other sources[7].

Breast milk that has been expressed, pasteurized and stored in sterilized conditions is safe and healthy for babies. The milk in the human milk bank is collected from donor mothers on the third day after giving birth, if they fulfill certain safety criteria that have been set by the hospital. The milk bank has one refrigerator, one sterilizer and two pasteurizers[8]. The steel containers are washed and sterilized in the sterilizer. The containers are then sent for collection of milk. The technician washes her hands, and labels the containers. The milk is pasteurized in the pasteurizer for half an hour at the prescribed temperature. A sample is taken and sent to microbiology department for testing for infections. After the report comes the milk is stored in the freezer at -20 degrees C. Milk thus collected can be stored for 3 to 6 months in prescribed conditions[9].

Working mothers are more prevalent in today's world comparing with the ancient era. This brings a greater revolution in the life style of the people. So the women cannot concentrate on adequate nutrition to the child at the fullest. On the other hand women who are not able to breast fed their child because of the circumstances like diseases, infections or due to death of the mother soon after the delivery. At this point human milk banking is the better option[10].

A study was conducted in South Australia by Lording R J in 2006.The study explored mothers knowledge towards human milk banks. Semi structured interview was conducted with 12 mothers who were breast feeding or have preterm babies or sick babies. Mothers of pre term infants would use a human milk bank only if they are ensured that milk was safe and appropriate for their babies[11].

A study conducted by Ahmet Karadag, Ramzan Ozdemir,Nuharrem Ak,Ali Ozer,Deryo Gumus Dogan and Ozlem Elkiran,Turkey, the study aims to determine the knowledge . They used descriptive cross sectional study on 1042 mothers who delivered at 2 different hospitals in Turkey. The result was almost half of the participating mothers (49.9%) agreed to the establishment of alternative HMB. Only 7.75% of mothers expressed views in favour of HMB .Only 9.2% mothers were willing to donate their breast milk for HMB.33.9% of mothers approved receiving milk from this type of HMB[12].

A study was conducted by Derya Kaya Senol, Ergul Aslan in Turkey. The study was to determine opinion of woman about human milk donation and HMB. They used cross sectional descriptive design on 231 married women who gave birth at least once. Data was collected using questionnaire and face to face interview, result was half of the women found human milk donation acceptable and 58% of the women stated they wanted to donate their milk ,45% women refused since it was against religious rule and 23.6% since it was having risk for infectious disease[13].

A study conducted in India (2006) has been providing mother's milk to new born babies. The human milk banking at Sion Hospital caters new born and premature babies whose mother's do not lactate. There are at least 8000 babies born every year, in that 20-35% of these cases, direct breast feeding becomes impossible where human milk bank becomes a support system[14].

A study conducted in Perth; the expression of breast wil allow of the mother to be away intermittently from her infant while continuing to breast feed. Total 587 mothers were taken, out of which 93% of mothers though returning from work were exclusively giving breast milk with the help of expressed breast milk whereas 7% discontinued with the reason of less breast milk[15].

A study conducted at Tumkur City to assess the effectiveness of information booklet on knowledge and practices of expressed breast milk among 30 postnatal mothers. The result was that 71% of mothers were found to get effective information regarding expressed breast milk[16].

**Need for the study**

Working mothers are more prevalent in today's world comparing with the ancient era. This brings a greater revolution in the life style. Women who are not able to breast fed their child because of the circumstances like diseases, infections or due to death of the mother soon after the delivery. At this point human milk banking is the better option.

When maternal breast milk is not available in sufficient quantity, donor breast milk is recommended as an alternate source of nutrition, particularly in preterm and other high-risk infants.

It is universally accepted that breast milk is the optimum exclusive source of nutrition for the first six months of life. Despite advances in infant formulas, human breast milk provides a bioactive matrix of benefits that cannot be replicated by any other source of nutrition. When the mother's own milk is unavailable for the sick, hospitalized newborn, pasteurized human donor breast milk should be made available as an alternative feeding choice.

Promoting health is the role of an advanced nurse practitioner in improving and maintaining the health and well-being of newborn babies. Educating and empowering the antenatal mothers to integrate healthy practices is an important task in the hand of health care providers. Therefore, the investigator was interested in preparing an information booklet on human milk banking.

**Objectives**

1. To assess the knowledge of antenatal mothers regarding human milk banking.

2. To find an association between knowledge of antenatal mothers on milk banking with selected demographic variables.

3. To prepare an information booklet on human milk banking

**Protection of human subject**

1. Ethical clearance was obtained from Institutional ethics committee after presenting the research proposal.

2. To conduct research study, the investigator obtained written permission from Justice K. S Hegde Hospital. Informed consent obtained and confidentiality was assured.

**Research methodology**

Quantitative research approach was adopted in the study. Convenient sampling technique was used to select 100 antenatal mothers from Justice K. S. Hegde charitable hospital. Descriptive survey design was adopted in order to accomplish the objectives.

The data collection instruments were demographic proforma and a structured knowledge questionnaire on human milk banking consists of 28 questions. The value of reliability of tool was obtained through Cronbach's Alpha using SPSS statistics and it is found to be reliable with the score 0.76. The data were collected from 11/1/2019 to 19/2/19. And the data were entered systematically in the SPSS for data analysis.

**Development of information booklet**

On interpretation of results it was found that only few antenatal mothers had some knowledge on human milk banking. To spread the awareness about human milk banking an information booklet was developed that provided basic information on human milk banking and its need.

## Result

Data were analyzed using descriptive and inferential statistics with the help of frequency and percentage. Chi square test have been applied to find the association. Data analysis under the following sections

**Section I:** Description of demographic proforma

**Section II:** Knowledge on human milk banking

**Section III:** Association between knowledge of antenatal mothers with selected demographic variables.

SECTION I: DESCRIPTION OF DEMOGRAPHIC CHARACTERISTIC

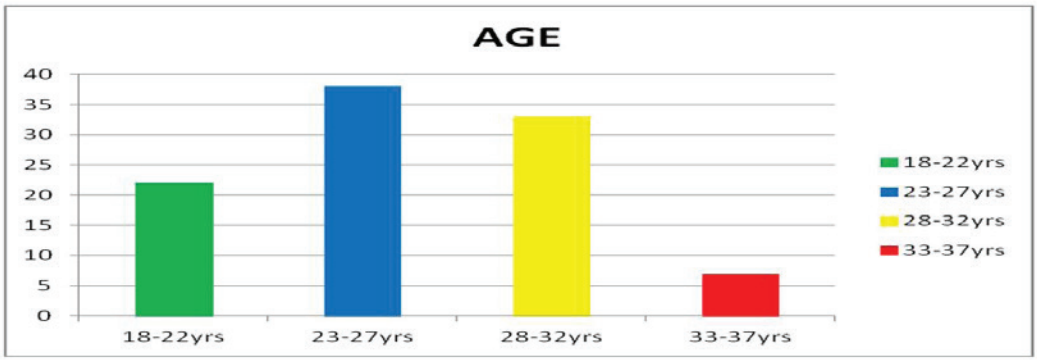


**Figure 2: Distribution of age**

**Fig 1: Distribution of Age**

The graphical representation depicts that out of 100 participants 38 of them were in the age group of 23-27 years and 33 of them were in the age group of 28-32 years, 22 were in the age group of 18-22 years and only 7 of them were in the age group of 33-37 years.

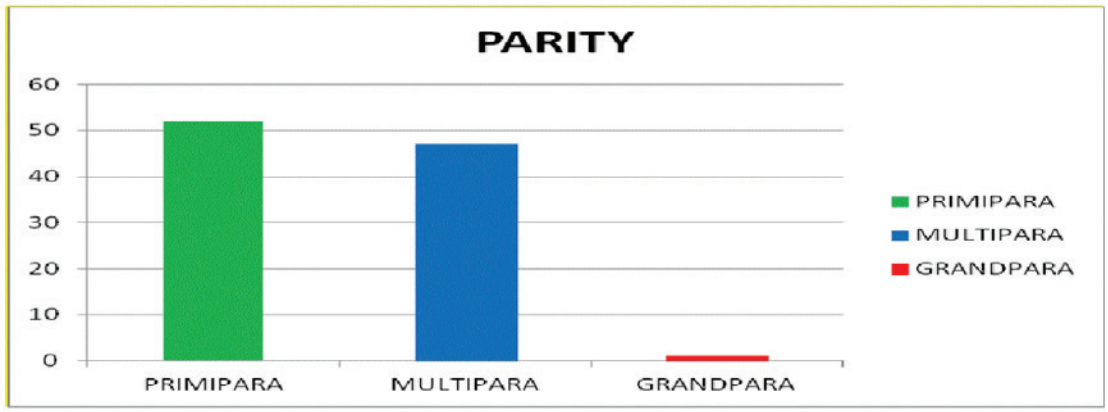


**Figure 3: Distribution of Parity**

**Fig 2: Distribution of Parity**

The bar diagram shows that 52 of them were primipara, 47 of them were multipara and only 1 belongs to grand multipara

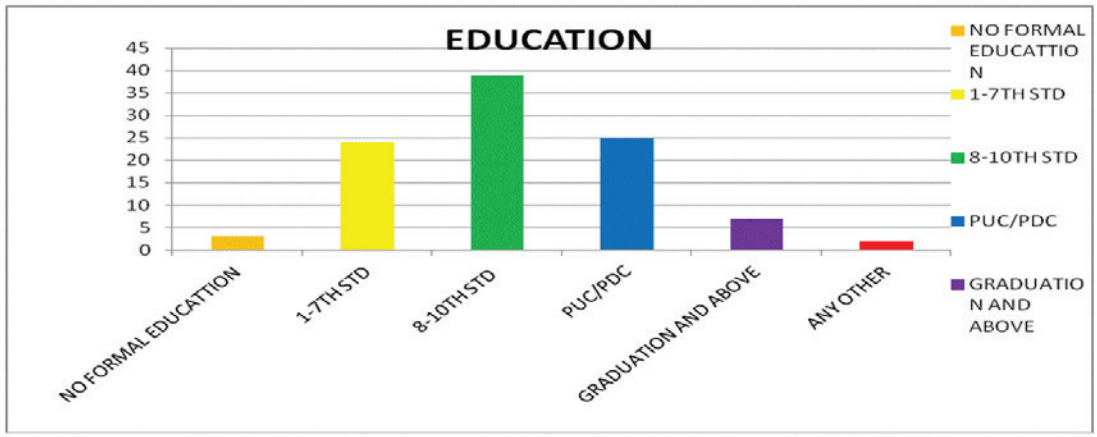


**Figure 4: Educational Status of antenatal mothers**

**Fig 3: Educational status of antenatal mothers**

The bar diagram shows, out of total participants 3 of them were having no formal education, 24 of them had education between 1-7th standard, 39 of them educated in between 8-10th standard, 25 of them studied till PUC and 7 of them were graduates and only 2 of them were not belonging to any of these categories.

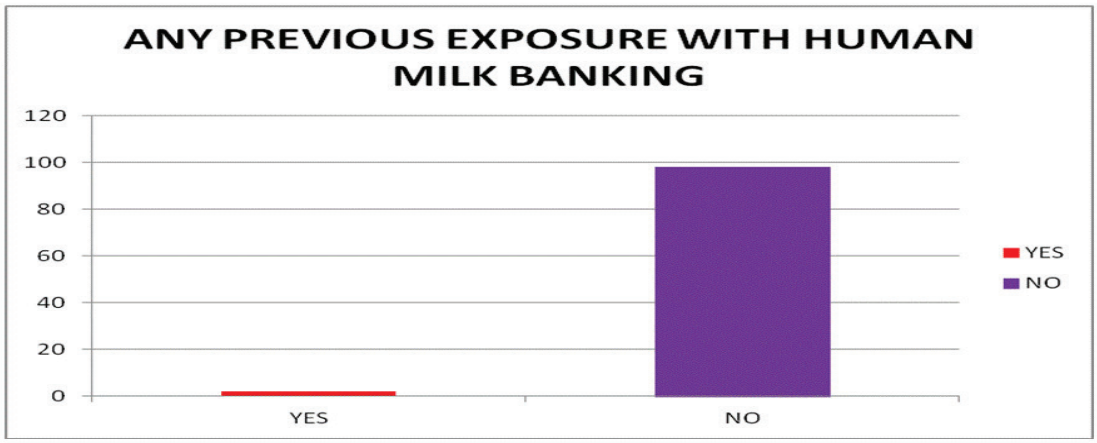


**Figure 5: previous exposure to human Milk banking**

**Fig 4: Previous exposure to human Milk banking**

Bar diagram shows that, out of 100 participants 98% of them were not having any previous exposure with human milk banking and only 2% of them were having a vague knowledge regarding human milk banking.

**Section II:** Knowledge on human milk banking

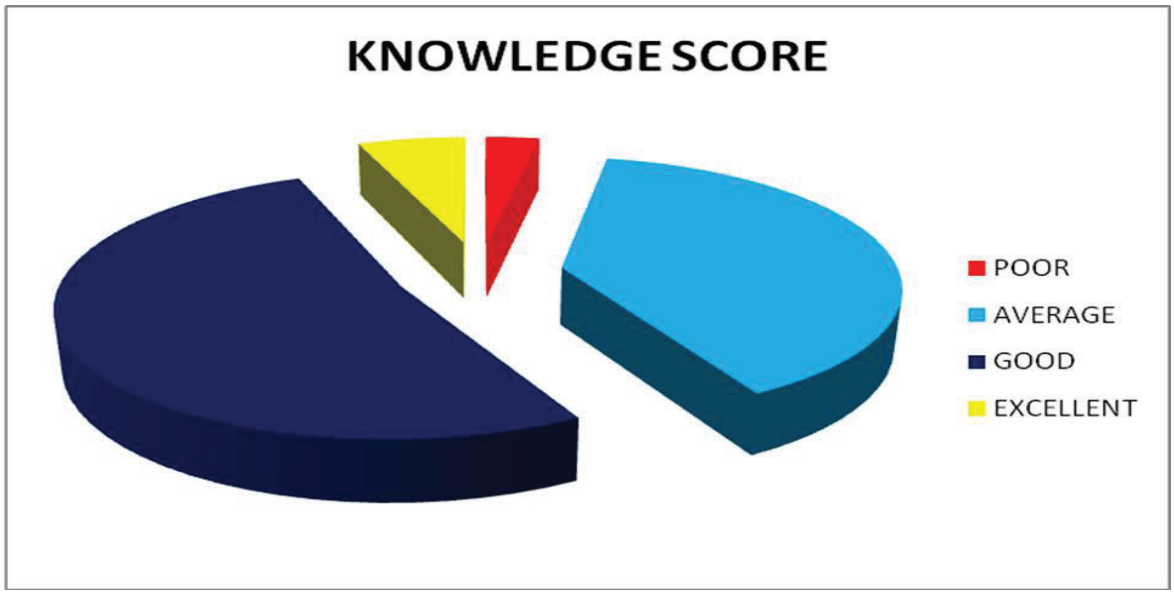


**Figure 6: Level of knowledge on Human Milk Banking**

**Fig 5: Level of Knowledge on Human Milk Banking**

Pie diagram depicts majority of the participants (52%) were having good knowledge regarding human milk banking following 39% of the antenatal mothers were having average knowledge, a few (6%) were having excellent knowledge and only 3% were having poor knowledge on human

**Section III:** Association between knowledge of antenatal mothers with selected demographic variables.

The results of the study shows that the 'P' value of chi square test for association between knowledge on human milk banking with demographic variables such as age is 0.099, whereas the 'p' value of parity is 0.718. Meanwhile the 'p' value of family is 0.213 and that of religion is 0.428. For education, occupation, income and any previous exposure with human milk banking the 'p' values were 0.284, 0.082, 0.104 and 0.750 respectively. The table mentioned above shows that for all the demographic characteristics, the p value is >0.05. Hence it was found that there was no significant association between knowledge of antenatal mothers with selected demographic variables.

## Discussion

Description on demographic variables

Majority of the subjects (38%) belong to 23-27 years of age group.

Most of the mothers (52%) were belonging to primipara.

It is evident that majority of mothers (65%) belong to nuclear family.

More number of the antenatal mothers (64%) belongs to Hindu religion.

The greater (39%) were having education between 8-10th standard.

More than half of them (56%) having income of <10000.

Two of them had received the information about human milk banking from internet. In a study on 60 working mothers those who are working in selected urban areas most of the mothers were in the age group of 18-35years.Majority of the study population were Hindus (85%), housewives (77%), living in nuclear family set-up (66%).

Description on knowledge score of antenatal mothers.

The findings of the study revealed that 52% of antenatal mothers had good knowledge and 39% of them had average knowledge on milk banking. Whereas only 6% of the mothers had excellent knowledge and 3 of them had poor knowledge.

The above findings were supported by the study conducted by Sangeetha et.al in selected hospitals to assess the knowledge and attitude regarding donating milk to the human milk bank. This study consisted of 60 postnatal mothers of selected hospital. Results shows that majority of the samples were having adequate knowledge.78 .33% of the samples had excellent level of knowledge score and 21.67% had good knowledge score.

## Conclusion

Change is the end result of all through Learning 17.

Artificial formula feeds cannot supply broad benefits of human milk. The most suitable way to acquire is only the Human Milk Banking. A large number of literatures strongly suggest that the antenatal mothers have poor knowledge on Human Milk Banking. Health education is one of the cost effective means that can be adopted to educate the antenatal mothers regarding human milk banking will help them in times of need, which can save lives.

Recommendations for future research:

A comparative study can be done in both antenatal and postnatal mothers to assess the knowledge regarding human milk banking.

**Acknowledgment**

The authors deeply acknowledge the antenatal mothers for their participation in the study.

**Conflict of Interest:** Nil

**Source of Funding:** Self

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# A Study on Occupational Health Psychology of Employees in IT Sector in Ahmedabad City

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## Abstract

In this fast paced global world, human being is surrounded by numerous tensions and various competitors. To survive in this complex world one has to put his whole and sole effort to earn his livelihood. For this he has to do millions of work which causes stress. So employees need to manage stress and remove their occupational illness.

The objective of this research is to determine how occupational health psychology is being handled in IT industry. Along with that I will analyze the importance of stress management from the organizations point of view, identify reasons, effects and stress release strategies. I have used primary data of the IT industry to study how health and safety measures can be taken to remove the mental and physical illness of employees in IT sector. Secondary data is also used for analysis purpose.

***Keywords:*** *Stress, Occupational Health Psychology, Information technology,Stress Management*

## Introduction

The Information technology industry in India has gained a brand identity as a knowledge economy due to its IT and ITES (IT-Enabled Services) sector. TheIT–ITES industry has two major components: IT Services and business process outsourcing (BPO).[10]The growth in the service sector in India has been led by the IT–ITES sector, contributing substantially to increase in GDP, employment, and exports.The New Telecommunications Policy, 1999 (NTP 1999) helped further liberalize India's telecommunications sector. The Information Technology Act 2000 created legal procedures for electronic transactions and e-commerce.[16] The success of Information Technology in India not only had economic repercussions but also had far-reaching political consequences. India's reputation both as a source and a destination for skilled workforce helped it improve its relations with a number of world economies. The relationship between economy and technologyvalued in the western world facilitated the growth of an entrepreneurial class of immigrant Indians, which further helped aid in promoting technology-driven growth.India's growing stature in the Information Age enabled it to form close ties with both the United States of Americaand the European Union. However, the recent global financial crises has deeply impacted the Indian IT companies as well as global companies. As a result hiring has dropped sharply, and employees are looking at different sectors like the financial service, telecommunications, and manufacturing industries, which have been growing phenomenally over the last few years.[7]

India's IT Services industry was born in Mumbai in 1967 with the establishment of Tata Group in partnership with Burroughs. The first software export zone SEEPZ was set up here way back in 1973, the old avatar of the modern day IT park. More than 80 percent of the country's software exports happened out of SEEPZ, Mumbai in 80s.[9]

In this fast paced global world, human being is surrounded by numerous tensions and various competitors. To survive in this complex world one has to put his whole and sole effort to earn his livelihood.[1] For this he has to do millions of work which causes stress. So employees need to manage stress and remove their occupational illness.

The objective of my research is to determine how occupational health psychology is being handled in IT industry. Along with that I will analyze the importance of stress management from the organizations point of view, identify reasons, effects and stress release strategies.[8] I

can also recommend some strategies for future course of action. I have used questionnaire as a research tool to study how health and safety measures can be taken to remove the mental and physical illness of employees in IT sector. Secondary data is collected through internet and magazines. I have done analysis with the help of different charts and used chi-square as a statistical tool.

## Literature Review

A literature review revealed the following: key work factors associated with psychological ill health and sickness absence in staff were long hours worked, work overload and pressure, and the effects of these on personal lives; lack of control over work; lack of participation in decision making; poor social support; and unclear management and work role.[3] There was some evidence that sickness absence was associated with poor management style. Successful interventions that improved psychological health and levels of sickness absence used training and organisational approaches to increase participation in decision making and problem solving, increase support and feedback, and improve communication.

It is concluded that many of the work related variables associated with high levels of psychological ill health are potentially amenable to change. This is shown in intervention studies that have successfully improved psychological health and reduced sickness absence.[6]

The primary emphasis will be on the development and maintenance of healthy people within healthy organizations focusing on prevention of illness, disease, health problems, and injuries in the work environment. Specific topics covered include occupational safety and health hazards, organization of work factors and their relation to employee safety and health, safety climate and training, the etiology of job stress and burnout, workplace health promotion programs and the role of employee assistance programs, the interface of work and non-work factors in maintaining occupational health.[5]

**The Society for Occupational Health Psychology (SOHP)** is a learned society with as focal point the "generation, dissemination, and application of scientific knowledge in order to improve worker health and well-being." Moreover, understanding the significance of a healthy work environment can directly provide and contribute to work mastery and work ethic.[14]

**Employee assistance programs (EAPs)** are plans that help identify and resolve issues facing troubled employees through short-term counseling, referrals to specialized professionals or organizations.Occupational health is essentially preventive medicine.[12] The joint **International Labor Organization(ILO) & World Health Organization(WHO)** Committee-"occupational healthshould aim at the promotion and maintenance of the highest degree of physical, mental and social well being of the workers/employees in all occupations.

## Background of the Study

A number of individuals contributed to the foundation of OHP. The Industrial Revolution in the nineteenth century prompted thinkers to concern themselves with the nature of work. Marx'stheory of alienation of the industrial worker has been influential. Taylor's (1911) Principles of Scientific Management and Mayo's research in the late 1920s and early 1930s on workers at the Hawthorne Western Electric plant helped to inject work and its impact on workers into the subject matter psychology addresses and contributed to the development of OHP.Since 1950, the International Labour Organization (ILO) and the World Health Organization (WHO) have shared a common definition of occupational health.[13] It was adopted by the Joint ILO/WHO Committee on Occupational Health at its first session in 1950 and revised at its twelfth session in 1995. OHP is especially concerned with the dramatic transformation of work and employment that has been underway in industrial economies since the 1980s (e.g., flexible employment and production processes), and how changing organizational structures and processes are influencing the health and well-being of workers and their families.[4]

Many psychologists have argued that the psychology field needs to take a more active role in research and practice to prevent occupational stress, illness, and injury.[11]This is what the new field of Occupational Health Psychology (OHP) is all about.**OHP concerns the application of psychology to improving the quality of work life, and to protecting and promoting the safety, health and well-being of workers.**

### Problem Statement of the Study

Rapidly changing conditions of work and employment have brought the topic of work organization and health to the forefront of concern in occupational safety and health.[2] This paper begins with

a historical overview of psychology's contribution to the occupational safety and health field. It then argues that the changing work environment creates new and special needs for research and application by psychologists in the area of work organization and health.

This problem statement investigates the relationship between the physical and mental health of the employees and different parameters such as job performance, compensation, organization climate and culture etc.[15]

## Objectives of the Study

OHP research examines the impact of work on both physical and mental well-being. Knowledge derived from this research helps researchers and practitioners devise means for improving the lives of people who work.Occupational Health Psychology research and practice aim at developing interventions at individual and organizational level in order to create healthier organizations and healthier employees and to maximize employees' effectiveness and work performance. This can be the excellent opportunity to develop practical skills for working as organizational consultants in multinational environments.The main objective of this research study is know how to:

· To promote and maintain the highest degree of physical, mental and social well-being of workers in all occupations;

· The prevention amongst workers of departures from health caused by their working conditions;

· The protection of workers in their employment from risks resulting from factors adverse to health;

· The placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities.

**Hypothesis**

**H0: Occupational health psychology of employees in IT sector is GOOD**

**H1: Occupational health psychology of employees in IT sector is not GOOD**

## Research Methodology

**Sources of Data**

Interaction with Respondents was in the form of face-to-face interviews with the help of questionnaire. The questionnaire consisted of a set of questions, asked to the respondent for his/her response, the questionnaire was structured and non-disguised. It was done in a prearranged order and the object of the research was revealed to the respondent. The questionnaire consisted of combination of open ended and close-ended question.

**Primary Data**

The primary data was generated through extensive use of a structured questionnaire, which had both the open end and close-ended questions.Primary data is facts and information collected specifically for the purpose of the investigation at hand.

**Primary Data**

- Questionnaire
- Interviews with employees

**Secondary Data**

Secondary sources are research reports that use primary data to solve research problems.Secondary data has been gathered by others for their own purposes, but the data could be useful in the analysis of a wide range of real property. In general, secondary data exists in published sources.

**Secondary Sources**

- Internet
- Magazine
- Newspapers and Journals

According to the Survey conducted on over 150 IT professional the various findings are as under.

Various factors which cause the occupational health psychological issues are found to as shown in the graph amongst all this , as per chart no.1 **Heavy workload** given to the employee is the major factor that causes stress on high level and apart from that and work schedules and work delegation are the factors which causes moderate level of stress to the majority of people.

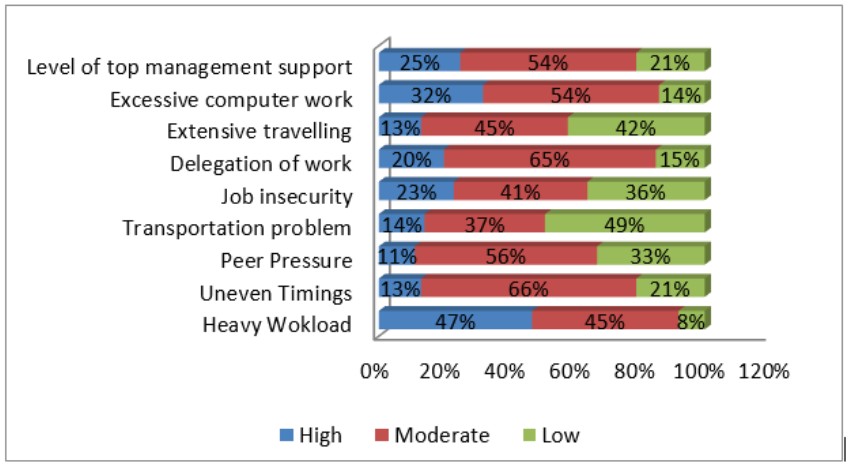


**Chart. 1. Causes of Occupational Health Pschology**

- During the survey that, in the ITindustry, the highest number of hazards i.e 66% are of technological types Viz excessive use of computers, the telephonic sounds etc.besides that 39% are affected by the psychological hazards.As per the chart no. 2 ,The lowest we found the percaentage of physical hazards.

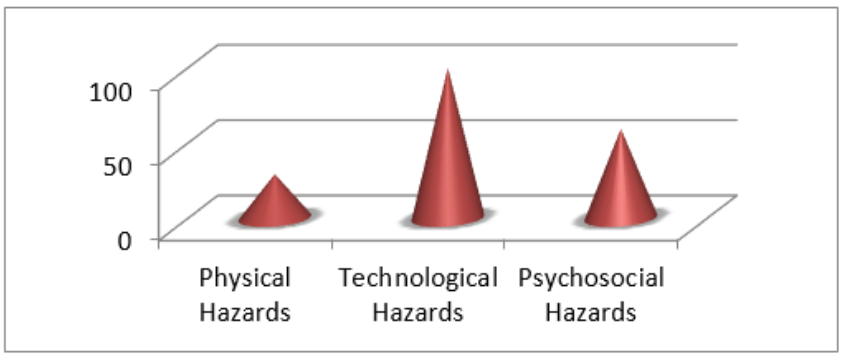


**Chart. 2. IT Industry Hazards**

- As per chart no. 3 we found that almost 48% respondents face job burnout due to excessive work and high pressure where as rest of the people never faced job burnouts. The other reasons for job burnouts may be unclear requirements, lack of personal control, poor communication, and insufficient compensation.

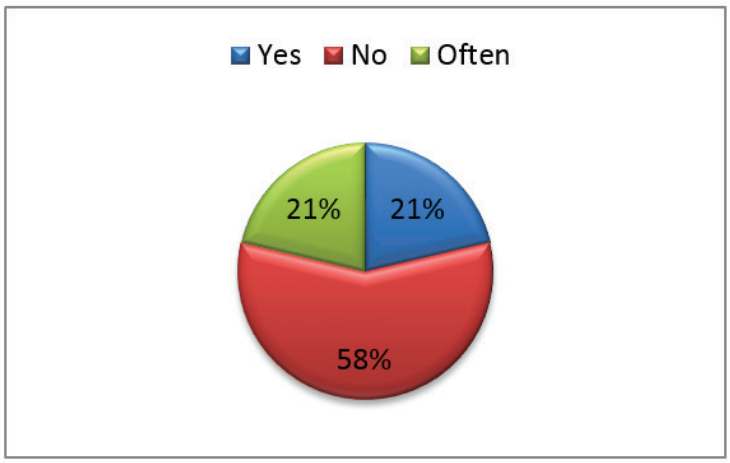


**Chart. 3.Job burn out**

**Hypothesis Testing**

**Pearson's chi-squared test between the Monthly Income and the Job Burnouts due to excessive stress and work pressure.**

**H0:** Income Level and Job burnouts are independent of each other.

**H1:** Income Level and Job burnouts are dependent of each other.

**Table. 1. Monthly Income and Job burnout**

| Job Burnouts | Monthly Income (in Rs) | | | | |
|---|---|---|---|---|---|
| | Less than 10,000 | 10,000-20,000 | 20,000-30,000 | Above 30,000 | Total |
| Yes | 4 | 15 | 7 | 6 | 32 |
| No | 9 | 26 | 33 | 18 | 86 |
| Often | 3 | 11 | 9 | 9 | 32 |
| Total | 16 | 52 | 49 | 33 | 150 |

**Table. 2. Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| **Pearson Chi-Square** | **4.962[a]** | **6** | **0.549** |
| Likelihood Ratio | 4.924 | 6 | 0.554 |
| Linear-by-Linear Association | 1.432 | 1 | 0.231 |
| N of Valid Cases | 150 | | |

**Interpretation**

0.05 < 0.549 So H0 is Accepted.

Hence : Alternative Hypothesis H1 is Rejected

Hence the Income Level does not affect the level of Job burnouts and thus they are independent of each other.

Pearson's chi-squared test between the Overall satisfaction level and the adoption of changes in the working environment.

**H0:** Overall satisfaction level and adoption of changes are independent of each other.

**H1:** Overall satisfaction level and adoption of changes are dependent of each other.

**Table. 3. Overall satisfaction Level**

| Adoption of changes | Overall satisfaction level | | | | |
|---|---|---|---|---|---|
| | Highly Satisfied | Satisfied | Neutral | Dissatisfied | Total |
| 1 | 14 | 80 | 14 | 1 | 109 |
| 2 | 0 | 0 | 7 | 0 | 7 |
| 3 | 4 | 12 | 17 | 1 | 34 |
| Total | 18 | 92 | 38 | 2 | 150 |

**Table. 4. Chi-Square Tests**

| | Value | Df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| **Pearson Chi-Square** | **42.720[a]** | **6** | **.000** |
| Likelihood Ratio | 41.361 | 6 | .000 |
| Linear-by-Linear Association | 14.673 | 1 | .000 |
| N of Valid Cases | 150 | | |

**Interpretation**

0.05 < 0.000 So H0 is Rejected.

**Hence :** Alternative Hypothesis H1 is Accepted. Thusoverall satisfaction level and adoption of changes are dependent of each other.

- Also I found that the age and gender does not affect the various factors which causes the occupational health psychological issues.
- I also found that a very less proportion of people are dis-satisfied with the income, reward and working environment of the companies.
- Out of 150 employees which I have surveyed, 71% of them are using work life policies provided by the organization, 29% of them do not use any kind of work life programs
- 91% of them are able to manage their personal and professional life

## Conclusion of the Study

Ahmedabad city is a fast developing city with all the amenities and facilities available. People of Ahmedabad lead a good life. After conducting the research in the city of Ahmedabad on the IT professional, I found that the there are some issues related to physical and psychological health but in manageable condition. Overall OHP of these employees can be considered as good enough and it can be improved taking initiatives using stress management techniques, physical fitness maintenance, technological monitoring etc.

## Limitations of the Study

- The opinion expressed is on response based.
- The sample size of model might not represent

perception of whole population as the sample size is small.

- ·The attitude of research might be biased.
- There is limitation of geographical research. As we know that the study is being carried out of the people of Ahmedabad only so a wider aspect and the wider scenario would be missing
- Last but not the least is that incomplete questionnaire, it is also a limitation means everyone is not taking interest in filling up the questionnaire.

**Conflict of Interest**- No

**Source of Funding -** Self

**Ethical Clearance** - NA

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# Acupressure– A Review with a Current and Future Prospective in Dentistry

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## Abstract

Alternative, collaborative, complimentary, integrative, natural, unconventional and holistic are the terms that are used to describe that do not conform to mainstream allopathic/western/orthodox health approaches.

WHO supports traditional and alternative medicines when these have demonstrated benefits for the patient with minimal risks.

In general, the harder a medical problem is to treat, the more treatment strategies exist. Patients and physicians are constantly looking for alternatives to drug therapy.

Empirical and scientific evidence exists to support the benefits of acupuncture, manual therapies and several medicinal plants for chronic or mild conditions. For instance, the effectiveness of acupuncture, a popular treatment for relieving pain, has been demonstrated both through numerous clinical trials and laboratory experiments. As a result, 90% of pain clinics in the United Kingdom and 70% in Germany include acupuncture as a form of treatment.

Acupressure is an easier form of Acupuncture wherein this technique of applying gentle pressure to various 'pressure points' on the body is used to cure various Diseases including relief of Pain.

The aim of this paper is to give a introduction to acupuncture/acupressure to the general dental practitioner and to understand its history, background, current trends, the relevance and the possibilities of its practice in dentistry.

***Keywords*** *– Acupressure, Acupuncture, Traditional Medicine, Dentistry, Alternative*

## Introduction

Health care can broadly be divided into modern (conventional, orthodox, Western or allopathic) and traditional (indigenous, complementary, alternative or integrative).

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With the effective leadership of WHO, a number of countries have developed traditional medicine policies. Research efforts in Western countries have been largely concerned with the quality, safety and efficacy of only certain forms of TCAM, such as herbal medicine and acupuncture.[1]

WHO supports traditional and alternative medicines when these have demonstrated benefits for the patient and minimal risks. But as more people use these medicines, governments should have the tools to ensure all stakeholders have the best information about their

benefits and their risks. [2]

Empirical and scientific evidence exists to support the benefits of acupuncture, manual therapies and several medicinal plants for chronic or mild conditions. For instance, the effectiveness of acupuncture, a popular treatment for relieving pain, has been demonstrated both through numerous clinical trials and laboratory experiments. As a result, 90% of pain clinics in the United Kingdom and 70% in Germany include acupuncture as a form of treatment.

The Acupressure therapy was known in India even 5000 years ago (according to Sushruta Samhita). Unfortunately, it was not preserved properly and went to Sri Lanka in the form of Acupuncture. From Sri Lanka, this therapy was taken to China and Japan by Buddhist Monks or nomadic Aryans and at present China is dominating this field. This therapy was known to the Red Indians way back in the 16th century. [3]

Acupuncture involves inserting needles into certain locations, called acupoints, on the body. Research has shown that acupuncture may trigger the body to release pain-relieving chemicals in the body called endorphins. According to this traditional medicine, every person has vital energy, called "Qi" flowing through his or her body. This invisible energy, which travels along twelve major pathways called meridians, can become imbalanced, creating areas of deficient (less) and excess (more) Qi. It is thought that imbalanced Qi can cause illness.

Acupuncture/Acupressure works to restore the balance of Qi by stimulating certain points on the body that affect the flow of Qi. As a result, Qi is sent to areas of deficiency and removed from areas of excess, which allows the body to function at its best.

The body has such consists of five basic elements viz., Earth, water, Fire, Air, and space controlled by electricity known as Bioelectricity. As long as this current of electricity flows properly in the body, the body remains fit and healthy. If, for any reason this current does not reach any part of the body, there is malfunctioning of that part accompanied by pain in many cases wherein the illness has been initiated. The Acupressure, thus is the science of nature which teaches us to cure diseases through the inbuilt mechanisms of the body-the technique of how to send the current to all the desired parts of the body. [3]

Organized Dentistry has yet to focus attention on alternative medicine anywhere near as much as, say, the American Medical Association, which recently devoted a full issue of its highly regarded Journal to studies on holistic medicine as part of clinical practice. But a growing number of dentists are currently testing and using various alternative therapies in the mouth. [4]

Literature also suggests that Acupressure at its best can be considered also as a "Way of Life" like basic exercises and not just being therapeutic.

Most of the disadvantages of Acupuncture such as by needle usage, precision, time consumption are eliminated by Acupressure wherein the needle usage is replaced by finger pressure without having any side effects. Acupressure is an ancient healing art, parallel to acupuncture, that is easy to learn and suitable for self-management of pain. It does not require expensive equipment and large space to provide treatment to the patient.

**Review**

**Chapman et al [5] (1977)** found that the tooth pain threshold to electrical stimulation was significantly raised by acupuncture. Their research also explained the possible pathway of the relief of the dental pain.

**Shimura N et al [6] (1980)** stated in his study that by acupuncture stimulation, the total number of oral streptococci and the caries pathogenic bacteria, Streptococcus Mutans, in the rats decreased and the anti RC-20 titre of the rat serum increased as the result of acupuncture stimulation.

**Pomeranz[7] (1989)** stated that acupuncture promoted neural regeneration and reduced pain perception in those patients undergoing surgery. He explained the therapeutic effects which might occur because of modulation of the limbic–paralimbic–neocortical network.

**Silva [8] (1989)** in his study wherein patients with trigeminal neuralgia were given a course of daily low-frequency EA treatments for 10 days. The treatments were repeated three times, with 1 week intervening between treatments. Thirty-six patients experienced complete relief, 4 patients experienced partial relief, and

the treatment failed in 2 patients.

**WHO Draft report [9] (1996)** mentions the details in "Acupuncture: Review and analysis of controlled clinical trials" wherein its applications in Dentistry being mentioned, wherein its states the following;

Acupuncture has been widely used in dentistry. There are reports of randomized controlled trials on the analgesic effect of acupuncture for postoperative pain from various dental procedures, including tooth extraction, pulp devitalisation and acute apical periodontitis. It was concluded that acupuncture should be considered a reasonable alternative or supplement to current dental practice as an analgesic. Its use in the treatment of temporomandibular dysfunction was also supported in these studies.

**Ernst E, Pittler MH [10] (1998) and Bensoussan A. [11] (1999)** in their systematic review concluded that acupuncture can alleviate dental pain.

**P Rosted and Palle Rosted [12] (2000)** pointed out that Acupressure or acupuncture is not a miracle cure like any other therapies and has its own limitations ; In the general management of pain Acupuncture proves to be a very safe technique in the hands of a properly trained practitioner and hence should be regarded as supplement to conventional treatment.

**Zijlstra et al.[13] (2003)** in his review article by suggested the hypothesis for the anti-inflammatory action of acupuncture.

**World Health Organization (WHO)** in 1979, endorsed the use of acupuncture to treat 43 symptoms, which was later discussed by Wong.[14] In 1996, this was extended to 64 conditions. In the Geneva WHO 2003 report[2] (2004), pain in dentistry (including dental pain and temporomandibular dysfunction), facial pain and postoperative pain were listed among the conditions for which acupuncture has been proven to be successful through controlled trials, to be an effective treatment

**Kavoussi and Ross[15] (2007)** hypothesized as how acupuncture may produce its analgesic, antianxiety, and other therapeutic effects.

**Tavares et al.[16] (2007)** suggested that EA controlled postoperative pain following mandibular third-molar surgical removal; this could be because of efferent vagus-nerve activation and inflammatory macrophage deactivation.

**Karst et al.[17] (2007)** concluded that auricular acupuncture and intranasal midazolam were similarly effective for the treatment of dental anxiety.

**FDI Policy statement [18] (2008)** stated in their policy statement regarding "The Use of Acupuncture in Dentistry" that acupuncture has been used in treatment of a range of diseases/disorders and facilitation of dental treatments, particularly for analgesia associated with dental procedures and for the management of temporo-mandibular joint disorders, chronic oral-facial and myofacial pain syndromes, prominent gag reflex, and dental anxiety.

**Hüseyin Sert, et al [19] (2009)** reported a patient with Trigeminal Neuralgia who was treated successfully by acupuncture.

**Sari E [20] (2010)** stated in their study of the role of acupuncture for treating orthodontic patients with a gagging reflex. The researchers concluded that designated acupuncture points were efficient for controlling the gagging reflex.

**Albrecht Molsberger [21]** and **Gianni Allais et al [22] (2012)** concluded that, the application of acupressure for the control of Nausea and vomiting during a migraine attack seems to be justified.

**Purnachandrarao N. Naik et al [23] ( 2014)** stated in his review article that the role of acupuncture in dental pain may not involve removing the cause of the pain, but rather, serving as an adjunct in achieving pain relief.

**Ali Beikmoradi[24] (2012)** stated that his study provided a bright prospect for using complementary and alternative medicine, especially acupressure, to relieve patients' anxiety.

**Fengxia Liang, et al [25] (2015)** in their article "Acupuncture and Immunity" stated that acupuncture enhances resistance and is closely related with the immune system. More and more research has revealed that acupuncture enhances anti-cancer and anti-stress immune function and exert anti-inflammation effects.

**Rohmetra, Abhimanyu & Tandon, Ragni &**

**Singh, Kamlesh & Jaiswal, Ankita[26] (2017)** stated that in their detailed review of acupressure in orthodontics , many of the issues could be curbed in the dental clinics such as gagging, anxiety, TMJ pain in orthodontic and general dental setup.

**Priyanka Avisa et al [27] (2018)** concluded that Acupressure can be a viable alternative to reduce dental anxiety in children undergoing scaling and restorative procedures.

**Y. Sivinagini, Ashish R. Jain [28] (2018)** evaluated the role of role of acupuncture and acupressure in preventing gag reflex during prosthodontics treatment. They found that this method of controlling the gag reflex is simple, fast, and easier technique if the clinicians were trained in it and was found to be productive.

**Angela Adams, Joseph Eschman and Weiqing Ge [29] (2017) and Susan Murphy, ScD, OTR [30] (2019)** in their systematic reviews based on randomized controlled trials concluded that acupressure has been shown to be effective for relieving a variety of symptoms such as Low Back pain and can significantly improve function and decrease disability.

**Yihan He et al[4] (2019)** systematic review and Meta-analysis found that acupuncture and acupressure was significantly associated with reduced cancer pain and decreased use of analgesics, although the evidence level was moderate.

**NCCIH clinical digest[31] (2020)** · For patients with chronic low-back pain, recent evidence-based clinical practice guidelines from the American College of Physicians gave a strong recommendation that clinicians and patients should initially select non-pharmacologic treatment with exercise, multidisciplinary rehabilitation, acupuncture, or mindfulness-based stress reduction.

**Legality of Practice:** Govt. of India with the lead from chairmanship of Director General ICMR stated in its order no R.14015/25/96-U & H (Pt) dated 25th November 2003, addressing to relevant authorities including Dental Council of India regarding grant of permission for various streams of alternative medicines recommended that certain practices of Acupuncture and hypnotherapy which qualified as modes of therapy could be allowed to be practiced by registered practitioners or appropriately trained personnel.[32]

## Summary and Conclusion

To summarize, various conditions in dentistry have been regularly studied with and carried out with considerable relief to their symptoms related to Pain, Gagging reflux, Dental caries, Habits, Immunological disorders, Psychological disorders and also Occupational Hazards such as Fatigue, Cervical spondylosis / Neck pain, Insomnia, Chronic Low back ache and Migraines.

Acupressure focusses on the theory that prevention before the onset of the diseases or intervening in an early stage of diseases is much better than treating after the onset. Acupressure may prove to be beneficial to both patients and dentists, when used as an adjunct to conventional therapies. Thus this alternative traditional therapy with the support of WHO , being found to be beneficial in the various departments of dentistry, a further extensive research in these fields definitely would help to establish these therapies into the Medical and dental curriculum.

**It's a high time that utmost priority be given to these therapies, revisit, explore and to establish these Indian therapies, before they completely disappear along with its therapeutic benefits, it offers to the scientific world.**

**Conflict of Interest** – Nil

**Acknowledgments:** Highly Thankful for the guidance by Late Dr Devendra Vora and Dr Homi Billimoria , Mumbai. Also immensely thankful to Dr Dan Kisto, Mauritius, Dr Dieu Thuy Dao and Dr. Le Hai, National Hospital of Traditional Medicine, Vietnam for giving an opportunity to learn from their respective universities.

**Ethical Clearance** – Not required.

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# Does Cerclage wiring with Intramedullary Nailing in Subtrochanteric Fractures Improve the Final Outcome?

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## Abstract

Treatment of subtrochanteric fractures is challenging due to anatomical and biomechanical factors. Many methods have been suggested to achieve and maintain fracture reduction during operative fixation for subtrochanteric fractures. Open reduction and intramedullary fixation, clamp assisted reduction without cerclage wires and fracture reduction cables are suggested methods. We conducted a retrospective study to look for the results of subtrochanteric fractures managed by intramedullary fixation with or without cerclage wires. We reviewed all cases of subtrochanteric fractures operated with intramedullary fixation with long proximal femoral nail with or without cerclage wire fixation. All available data from patient's records available in medical records department were retrieved and evaluated. Statistical analysis were performed using SPSS software (v16). There were 86 cases of subtrochanteric fractures operated with intramedullary fixation at our Hospitals over a period of 5 years. Quality of fracture reduction of fractures are assessed good reduction was seen more often in cerclage group 64%. Cerclage wiring was done in 14 cases. Nonunion was seen in 8 cases overall, 3 in cerclage group and 5 in non Cerclage group. Implant failure was seen in 3 cases in no cerclage group and 2 cases of cerclage group. We conclude that anatomical reduction is the key factor for successful outcomes. Closed reduction with good to acceptable reduction had better results. Cerclage wiring should be considered in selected cases where reduction is poor after open reduction.

***Keywords**: Subtrochanteric fractures, cerclage wiring, complications of subtrochanteric fractures*

## Introduction

Fractures occurring between lesser trochanter and isthmus of femur are treated as subtrochanteric fractures. Subtrochanteric femur fractures are also defined as fracture of the proximal femur with fracture line within 5cm below the lesser trochanter. Treatment of these fractures is challenging due to anatomical and biomechanical factors. Flexion, abduction and external rotation deformity due to strong muscular forces of Psoas, abductors and gluteal muscles[1].

Adequate reduction and fixation is difficult even for experienced surgeons. These fractures are associated with high rate of complications due to deforming forces, decreased vascularity, instability and osteoporosis[2].

Fixation options in these type of fractures include intramedullary nails, dynamic hip screws, dynamic condylar screws, proximal femoral locking plates [3-6]. Achieving anatomical reduction by closed methods is difficult in these fractures. The fracture comminution and anatomy of proximal femur makes it difficult for indirect fracture reduction techniques. Intramedullary fixation has been associated with better clinical outcomes and biomechanically higher fixation strength in previous studies[3-6].

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Many methods have been suggested to achieve and maintain fracture reduction during operative fixation for subtrochanteric fractures. Open reduction and intramedullary fixation, clamp assisted reduction without cerclage wires and fracture reduction cables are suggested methods [7-11].

We reviewed subtrochanteric fractures managed by intramedullary fixation with or without cerclage wires and analysed the results with regards to quality of reduction, union and complications.

## Materials and Method

We conducted a retrospective review of all cases of subtrochanteric fractures operated in our tertiary care hospital with intramedullary fixation with long proximal femoral nail (PFN,Matrix,India) or PFN Antirotation (Synthes,India) with or without cerclage wire fixation after obtaining approval for the study from institutional ethics committee. The study period was from August 2013 to August 2018. All cases with minimum 18months follow up were included. The AO foundation/Orthopaedic trauma Association (AO/OTA) classification system was used to classify fractures.

All fractures which were situated within 2 inches (5cm) from the lesser trochanter and fixed with intramedullary nail were included. Patients above 18 years below 75 years, isolated subtrochanteric fractures with configuration amenable to cerclage wiring like long oblique, spiral, were included

Patients below 18years, pathological fractures, open fractures, fractures sustained in patients treated with bisphosphonates, previous surgeries around hip and segmental fractures were excluded.

All available data from patient's records available in medical records department were retrieved and all available radiographs and clinical data were evaluated. Patients with data available for minimum 18 months were included. Major complications were identified and documented. These included non-union, infection, implant failure and return to surgery. The quality of reduction was assessed as good (both maximum cortical displacement <4mm and angulation $\leq 10^0$), acceptable (either maximal displacement <4mm or angulation $\leq 10^0$) or poor (maximum cortical displacement ≥4mm and angulation $>10^0$).

Statistical analysis were performed using SPSS software (v16). Data were analysed using mean and standard deviation for continuous and categorical data respectively. Chi square test was used for categorical variables and analysis of variance (ANOVA) was used to compare continuous variables. Statistical significance was significant when p value was <0.05.

## Results

We could identify 86 cases of subtrochanteric fractures for the period August 2013 to Aug 2018 operated with intramedullary fixation at our hospitals. Of them 55 met the inclusion criteria of our study. Mean age of the patients include in the study was 56.4 years and low velocity injuries were seen in 55% of the patients. Open reduction of the fractures was performed in 30 patients. Cerclage wiring was done in 14 cases. Cerclage wiring was used with cases treated with open reduction.

When quality of fracture reduction of subtrochanteric fractures are assessed good reduction was seen in 33% of the cases and more often in cerclage group 64% but was not statistically significant (Fig 1). Varus reduction was more frequently seen contributing to 29% of the cases and mostly when no cerclage was done. Of the 55 cases 18 cases were re operated again 10 of them were implant removal without complications and 8 cases were revised due to complications. There was no reported complications of passage of cerclage wire (Table 1)

Nonunion was seen in 8 cases overall, 3 in cerclage group and 5 in non Cerclage group. Implant failure was seen in 3 cases in no cerclage group and 2 cases of Cerclage group (Fig 2). Deep infection was seen in 2 cases each in both group and superficial infection in one case in no cerclage group which healed with antibiotics. Open reduction was done in all cases where infection was recorded (Table 1).

**Table 1: Outcomes of subtrochanteric fracture fixation**

| | Total<br>N=55 | No Circlage<br>N=41 | Circlage<br>N=14 | P value |
|---|---|---|---|---|
| Quality of Reduction (%) | Good=18(32.7)<br>Acceptable=26(47.3)<br>Poor=11(20) | Good- 9(22)<br>Acceptable=23(56)<br>Poor-9(22) | Good=9(64.2)<br>Acceptable=3(21.4)<br>Poor=2(14.2) | 0.848 |
| Varus Reduction | 16(29%) | 15(36.6%) | 01(7%) | 0.066 |
| Infection | 4(7.2%) | 2(4.8%) | 2(14%) | 0.530 |
| Nonunion | 8(14.5%) | 5(12%) | 3(21%) | 0.653 |

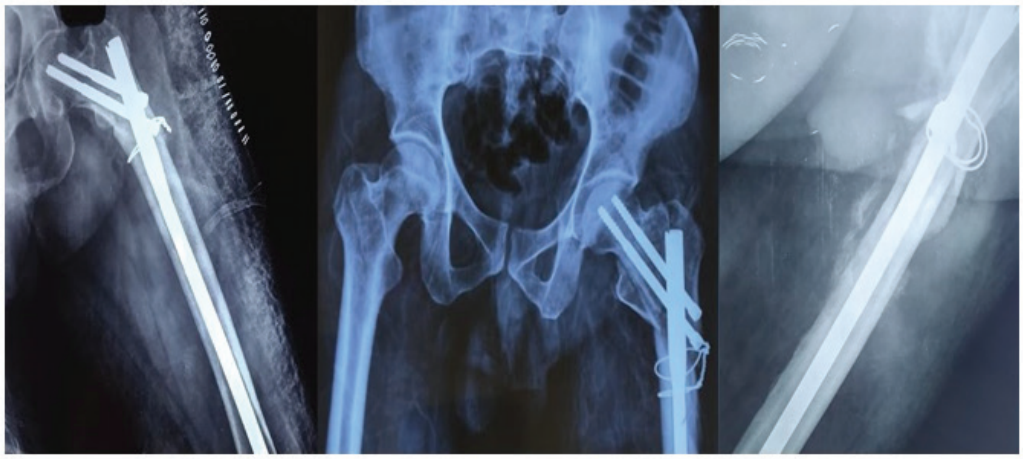

**Figure 1: Good reduction and union in circlage grou**

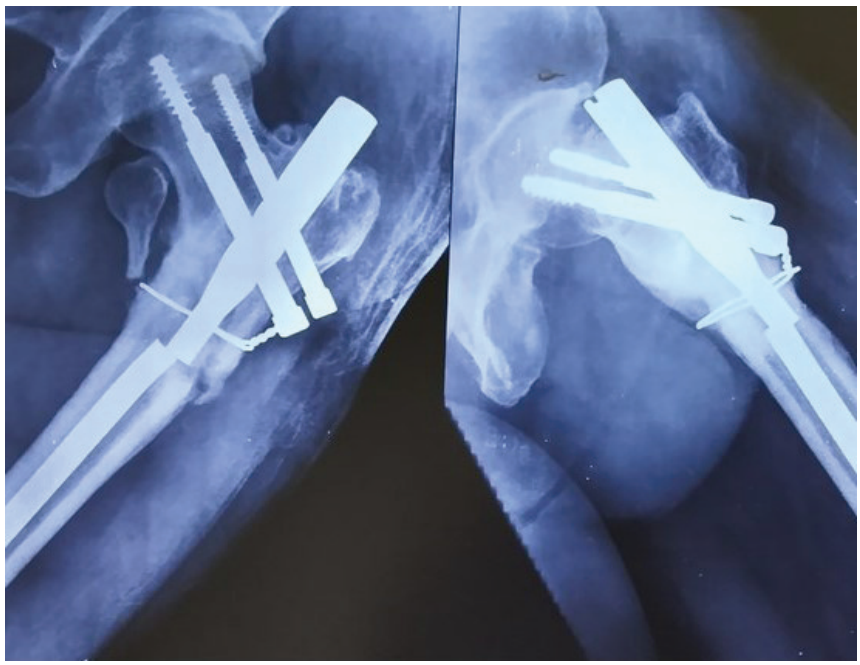

**Fig 2 a Complications in Circlage group – non-union with implant failur**

**Fig 2b Complications in Circlage group - implant failur**

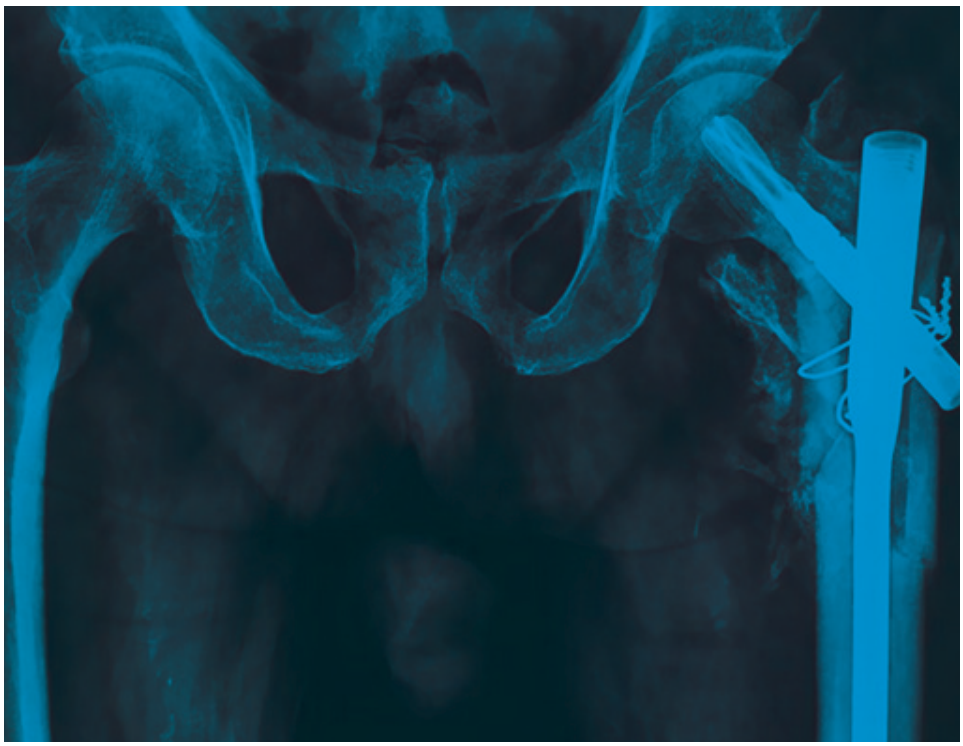

**Fig 2c Complications in Circlage group - Infectio**

## Discussion

Subtrochanteric fractures more often required open reduction for better anatomical reduction. Rates of non-union and revision surgery are determined by anatomical reduction intraoperatively. Anatomical reduction was key factor which results in early union and better functional outcomes. Cerclage wire fixation results in better reduction but is associated with few complications. In our study cerclage wiring was associated with complications like non-union and infection. Fractures managed with a

cerclage wire to augment intramedullary nail had less fracture displacement, less fracture angulation and improved quality of fracture reduction.

Subtrochanteric fractures require open reduction which has been reported in literature between 7-40%. Closed reduction preserves fracture hematoma and periosteal blood supply. But due to deforming forces achieving correct entry point is difficult. Minimal open reduction and maintaining with a reduction clamp[7] and intramedullary fixation has resulted in good functional outcomes and union. Judicial usage of cerclage wire has been recommended with minimal soft tissue disruption. Open reduction was done in 53% of our cases and in all cases of cerclage wiring and we could achieve good to acceptable reduction in 80% of cases [12].

Varus reduction results in poor functional outcomes, delayed and non-union[12-14] Varus reduction was present in all cases of non-union in our study. Cerclage wiring results in correcting varus reduction. With the cerclage wire passer, technique is simple and is not associated with any complications. The biomechanical advantage of cerclage wire has been studied and there was reduced varus deformation and cut out of proximal screws on cyclical loading. This is possible due to preservation of medial buttress and reducing fracture stress on lateral side [15]. Cerclage wiring being more invasive, was assumed to result in decreased blood supply to bone and fracture and eventually non-union but recent studies have suggested vascularity is preserved [16]. Every attempt should be made to preserve soft tissues and cerclage wiring with minimal soft tissue damage.

The limitation of the study was it was retrospective. All the data available were accumulated from patient's files and systematically reviewed. There was limitation in identifying all complications those who presented in other hospitals. Cerclage wiring technique could not be assessed for each surgery which may involve more soft tissue damage. Sample size was not adequate in detailed statistically analysis. Short term clinical and functional outcomes could not be assessed.

## Conclusion

We conclude that anatomical reduction is the key factor for successful outcomes. Closed reduction with good to acceptable reduction had better results. Cerclage wiring should be considered in selected cases where reduction is poor after open reduction.

**Acknowledgement:** Manipal Academy of Higher Education, Manipal, Kasturba Medical College, Mangalore and its constituent hospitals for offering this opportunity to conduct this research.

**Conflict of Interest** – Nil

**Source of Funding -** Nil

**Ethical Clearance**– Taken from Institutional Ethics Committee

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# Effect of Acupressure on Anxiety among Patients Undergoing Hemodialysis in Selected Hospitals of Ambala, Haryana: A Randomized Controlled Trial

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## Abstract

Patients with chronic kidney disease with co morbidities (like diabetes mellitus, hypertension) undergoing hemodialysis are more prone to stress and anxiety. Aims and Objectives: The aim of the study was to evaluate the effect of acupressure on anxiety among patients undergoing hemodialysis. Methodology: The research includes quantitative approach and design was Basic pre-test post-test (with optional repeated follow ups). The tool used i.e. selected variables regarding study participants characteristics and DASS-42 (Anxiety-14 items). Results: After the administration of acupressure, two third of the study participants in experimental group were at normal level (no anxiety) whereas in control group study participants were at severe and extreme level of anxiety. There was significant difference between experimental and control group in post-test I and post-test II i.e. ('t'= 13.35, p=0.00) and ('t'= 13.79, p=0.00) respectively. Further results showed significant difference within groups in experimental and control group (in inverse direction) as calculated (F value 1.62, p=0.00) and (F value 3.69, p=0.03) respectively. Step wise regression analysis was used which showed the predictability of selected variables on anxiety. Conclusion: Findings of this study concluded that Acupressure intervention given for 30 minutes at once was effective in reducing anxiety among patients undergoing hemodialysis.

***Keywords**: Acupressure, anxiety, patients undergoing hemodialysis*

## Introduction

Chronic kidney disease (CKD) is a condition in which the kidneys are damaged or cannot filter blood. Adults with diabetes, high blood pressure, or both have a higher risk of developing CKD than those without these diseases. Other risk factors for CKD include heart disease, obesity, and a family history of CKD[1] and more than 1 million people die annually from ESRD [2]. The number of patients who do receive dialysis seems likely to double from 1.0 to 2.0 million between 2010 and 2030.[3]

Among the patients of end stage renal disease, about 90% of the patients require hemodialysis (HD) three times a week while 9% of the patients adopt home peritoneal dialysis.[4] It has been reported that the average anxiety rate among ESRD patients is 38%. [5] It was found that compared with HD patients with depressive disorders, HD patients diagnosed with anxiety disorders have improved quality of life.[6]

Acupressure Therapy is effective in the relief of stress-related ailments and ideal for self-treatment and preventive health care for boosting the immune system.[7] Psychological illnesses need non-pharmacological treatment along with the pharmacological treatment for

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the better recovery of the patient both physically and psychologically.[8]

To explore more about the acupressure and its effect on anxiety based on the previous research evidences researcher decided to do research on acupressure among patients undergoing hemodialysis.

## Methodology

The study was conducted during the period from March 2017 to July 2018 in the state of Haryana, India. A sample of 70 patients undergoing hemodialysis in this study with the prior permission from the medical superintendent of M.M.I.M.S.R & Hospital, Mullana, Ambala and civil surgeon of Civil hospital, Ambala, Haryana**.** The written consent from the patients was collected prior to the study. Quantitative research approach with true experimental (basic pre - test with repeated optional follow ups) design was used in this study. Patients those who were undergoing hemodialysis in selected hospitals, having complete four limbs, able to understand and speak Hindi, alert, oriented, and comprehend to respond were included for experimental group with the same criteria was included for control group. Patients have no anxiety (scored 0-7 in DASS) were not willing to participate were excluded from the study. Seventy hemodialysis patients (35 in experimental group and 35 in control group) were selected using random sampling technique who were randomized into experimental and control group with lottery method.

**Description of Tool**

***1. Selected variables:***

It consists of 14 items related to selected variables i.e. Age in years, Gender, Religion, Marital status, Education, Occupation, Family income (per month), Socio-economic class, Duration of taking Hemodialysis treatment, Type of family, Place of living, Associated health problems, History of kidney disease in family, History of taking benzodiazepines / anti-anxiety drugs.

***2.* DASS- 42 *Scale to assess the anxiety***

It consists of 42 items (14 items for anxiety) with 4-point rating scale with total ranging from 0-42 for anxiety with self-report (Interview) technique. The calculated Cronbach Alpha Internal consistency was 0.74 (Acceptable range is 0.7-0.9).

**Procedure**

Pre-test of both groups were done by administering the tool i.e. Selected variables and DASS-42 before the hemodialysis. At 30 minutes of hemodialysis acupressure was administered for the duration of 30 min in which first 5 minutes for deep breathing exercise and 25 minutes for acupressure, (5 minutes for each area) only in experimental group. Acupressure was applied in five areas starts from i.e. toe of both foot followed by midway between the medial ends of the eyebrow, at the ulnar end of the transverse crease of wrist, at the midway between the tip of the medial malleolus on both legs and two points on the both sole of the foot i.e. one point for each foot for its therapeutic effect i.e. reduction of anxiety At 1 hour of hemodialysis (immediately after the intervention) post-test I was taken from both the groups with DASS-42 scale and on the completion of hemodialysis post-test II was taken from both groups.

## Data Analysis

**Descriptive statistics:** Frequency, percentage distribution was used to describe selected variables and Chi-square was used to assess the homogeneity between the groups.

**Inferential statistics:** Independent 't' test, Repeated Measure ANOVA, ANOVA, Post hoc test and Multiple regression analysis was used in the study.

## Results

Homogeneity between the experimental and control group was checked by $x^2$ test was applied to compare the experimental and control group with respect to every selected variable. Both the groups were homogenous in terms of selected variables except family income per month (p=0.04).

Percentage distribution of experimental and control groups in terms of level of anxiety are shown in figure 1. 40% in experimental group and 62.85 %in control group were at severe level of anxiety as shown in Figure 1.

**Insert Figure 1 almost here**

In terms of anxiety, there was no significant difference between experimental and control group found before administration of acupressure as the calculated 't' value was 0.68, p=0.48 with mean difference of 0.65. Mean score after administration of acupressure in experimental

group was 6.80 and in control group was 18.71 with mean difference of 11.91. The calculated 't' value was found to be 13.35, p= 0.00 in post-test I. In post-test II mean score after administration of acupressure in experimental group was 6.20 and in control group was 18.80 with mean difference of 12.60. The calculated 't' value was found to be 13.79, p=0.00.

**Insert Table 1almost here**

In experimental group there was a significant difference in the mean score of anxiety in pre-test (17.66), post- test I (6.80) and post-test II (6.80) and computed F value was 1.62 with p=0.00, whereas in control group the mean score of pre -test (17.00), post-test I (18.71) and post-test II (18.80) was in reverse direction and computed F value was 3.69, p=0.03.

**Insert Table 2 almost here**

In experimental group there was statistically significant difference between pre- test – post- test I (p=0.00), pre- test – post- test II (p=0.00) and post- test I – post- test II (p=0.02), that showed at the time of pre-test, participants had higher anxiety than the post- test I and post- test II. The participants had higher anxiety in post- test I than post- test II in experimental group whereas in control group there was also statistically significant difference between pre- test-post- test I (p=0.00) and pre- test-post-test II (p=0.00) but in reverse direction, participants had lesser anxiety in pre-test than post- test I and post-test II.

In experimental group, anxiety was independent of selected variables in post-test I except family monthly income (18000 – 36016 had higher mean score), duration of taking hemodialysis treatment (>5 years had higher mean score) and others disease (no other disease had higher mean scores). Further Post Hoc test was applied to reveal the mean difference of significant association in experimental group with selected variable (family monthly income) i.e. mean difference (4.38) in the family monthly income category i.e. p=0.01. It concludes that family income category of 13495-17999 had higher anxiety than in category of 1803-5386 in post- test I.

In control group, anxiety was independent of selected variables except heart disease (presence of heart disease had higher mean score) among patients undergoing hemodialysis in post-test 1.

In experimental group, anxiety was independent of selected variables in post-test II except occupation (semi profession having higher mean score), duration of taking hemodialysis treatment (4-5 years had higher mean scores) and hypertension (having hypertension had higher mean score).

Further multiple regression- Step wise analysis was performed to predict the effect of multiple independent variables on anxiety.

On pre-test anxiety, presence of nuclear family having the prediction with variability of 24% ($R^2$ =0.24) as calculated F value 10.43. Nuclear family in addition to history of taking benzodiazepines having the prediction with variability of 33% ($R^2$ =0.33). On post-test I anxiety, presence of diabetes having the prediction with the variability of 17% ($R^2$ = 0.17) as calculated F value 7.0 Diabetes in addition to presence of history of kidney disease in family having the prediction with the variability of 36% ($R^2$ = 0.36). Diabetes, history of kidney disease in family and presence of urban place of living having the prediction with the variability of 50% ($R^2$ = 0.50) as shown in table 3.

On post-test II anxiety, presence of diabetes having the prediction with the variability of 25% ($R^2$ = 0.25) Diabetes in addition to presence of history of kidney disease in family having the prediction with the variability of 38% ($R^2$ = 0.38).

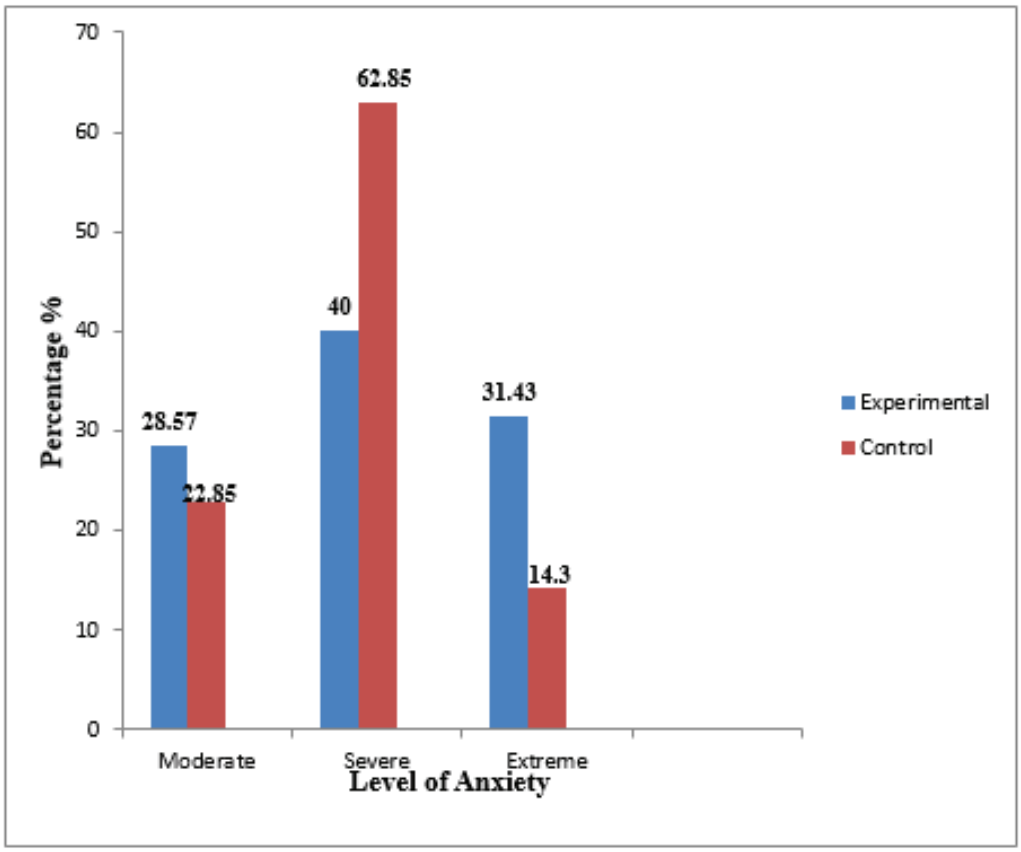


**FIGURE 1- LEVEL OF ANXIETY AMONG PATIENTS UNDERGOING HEMODIALYSIS IN EXPERIMENTAL AND CONTROL GROUP BEFORE ADMINISTRATION OF ACUPRESSURE**

**Table 1: Mean, Mean difference, Standard error of mean difference and 't' value of Anxiety among Patients undergoing Hemodialysis Before and after Administration of Acupressure in Experimental and Control group** N = 70

| Observation | Group | Mean ± S.D. | MD | | SEMD | 't' value | df | p value |
|---|---|---|---|---|---|---|---|---|
| Pre test | Experimenal (n = 35)<br>Control (n = 35) | 17.66 ± 4.53<br>17.00 ± 3.48 | 0.65 | | 0.96 | 0.68 | 68 | 0.48NS |
| Post test1 | Experimental (n = 35)<br>Control (n = 35) | 6.80 ±2.49<br>18.7± 4.65 | 11.9 | | 0.85 | 13.35 | 68 | 0.00* |
| Post test2 | Experimental (n = 35)<br>Control (n = 35) | 6.20±2.54<br>18.80± 4.77 | 12.6 | | 0.83 | 13.79 | 68 | 0.00* |

[NS] -Not significant (p>0.05) df (68) = 1.67 *- significant (p ≤ 0.05)

**Table 2: Repeated measure ANOVA showing the significant difference within groups in terms of Anxiety in Experimental and Control group N=70**

| Variable | Group | Test | Mean | F value | p value |
|---|---|---|---|---|---|
| Anxiety | Experimental (n=35) | Pre test | 17.66 | | |
| | | Post test I | 6.80 | 1.62 | 0.00* |
| | | Post test II | 6.20 | | |
| | Control (n=35) | Pre test | 17.00 | 3.69 | 0.03* |
| | | Post test I | 18.71 | | |
| | | Post test II | 18.80 | | |

*- Significant ($p \leq 0.05$)

**Table 3: Stepwise Regression showing Predictability of Individual Independent Variables on Anxiety in Experimental group (Regression Coefficient) in Different Observations N=35**

| observation | Model | Unstandardized coefficients | | Standardized coefficients | 't' value | p value |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| Pre Test | *(Constant)* | 16.87 | 0.72 | | 23.43 | 0.00* |
| | Nuclear family | 6.87 | 2.13 | 0.49 | 3.23 | 0.00* |
| | *(Constant)* | 18.40 | 0.99 | | 18.53 | 0.00* |
| | Nuclear family | 8.84 | 2.22 | 0.63 | 3.97 | 0.00* |
| | History of taking benzodiazepines | -2.79 | 1.31 | -0.33 | 2.13 | 0.04* |
| Post Test | (Constant) | 6.28 | 0.43 | | 14.46 | 0.00* |
| | Diabetes | 2.57 | 0.97 | 0.41 | 2.64 | 0.01* |
| | *(Constant)* | 5.38 | 0.48 | | 11.14 | 0.00* |
| | Diabetes | 3.02 | 0.87 | 0.49 | 3.44 | 0.00* |
| | History of kidney disease in family | 1.57 | 0.50 | 0.44 | 3.11 | 0.00* |
| | (Constant) | 4.14 | 0.60 | | 6.88 | 0.00* |
| | Diabetes | 2.10 | 0.84 | 0.34 | 2.49 | 0.01* |
| | History of kidney disease in family | 1.95 | 0.47 | 0.55 | 4.13 | 0.00* |
| | Urban place of living | 1.43 | 0.48 | 0.42 | 2.94 | 0.00* |
| Post Test II | *(Constant)* | 5.57 | 0.42 | | 13.12 | 0.00* |
| | Diabetes | 3.14 | 0.94 | 0.50 | 3.33 | 0.00* |
| | *(Constant)* | 4.80 | 0.48 | 0.56 | 9.89 | 0.00* |
| | Diabetes | 3.51 | 0.88 | 0.36 | 3.98 | 0.00* |
| | History of kidney disease | 1.31 | 0.51 | | 2.57 | 0.01* |

*- Significant ($p \leq 0.05$)

## Discussion

In the present study near about half of the study participants in control and less than half in experimental group were in the age group of 31-40 years i.e. 17 (48.6.3%) and i.e. 14 (40%) respectively. Less than 2/3rd of the study participants in control group and experimental group were male i.e.22 (62.9%). These findings were supported by a cross sectional study conducted by Ana Carolina Ottaviani et al (2016)[9] where they found more than half of the participants (60%) were in 18-59 years of age group and more than half of the participants (66%) were males.

In the present study in pre-test less than half of study participants in experimental group were at severe level of anxiety i.e. 14 (40%) and in control group 2/3rd of the study participants were also at the same level of anxiety as in experimental group i.e. 22(62.85%). These findings are contradictory to randomized controlled trial study conducted by Younes Mehrabi et al (2017) [10] on effect of Fordyce's Happiness Program on Stress, Anxiety, and Depression among the patients undergoing hemodialysis, where they found prevalence of anxiety among patients undergoing hemodialysis was 4.6% and 4.7% ($p > 0.05$) in trial and control group

In present study there was significant difference in terms of anxiety between experimental and control group after administration of acupressure the mean anxiety score in post-test 1 was 6.80±2.49 and 18.71±4.65 ($t=13.35$, $p=0.00$) in both the groups. In post-test II the mean anxiety score was 6.20±2.54 and 18.80 ±4.77 ($t=13.79$, $p=0.00$). These findings are similar to the previous randomized clinical trial study conducted by Ali Beikmoradi, et al. (2015)[11] on anxiety where they found mean anxiety score in the acupressure group after applying acupressure, in session 5 was 45.30 ± 7.14 and in session 10 it was 43.48 ± 6.82 ($p=0.00$) in experimental group which was significant in comparison to control group.

In present study there was a significant difference with in the experimental group from pre-test to post-test II in terms of anxiety as calculated by Repeated Measures ANOVA ($F$ value=1.62, $p=0.00$) which was significant at 0.05 level of significance. These findings are similar with the findings of the study conducted by Nant Thin Thin Hmwea et al. (2015) [12] where they found significant reduction in anxiety as the mean score reduced to 27.04 ± 20.4 from 34.37±22.61 after the administration of acupressure ($p=0.03$) in experimental group.

## Conclusion

Acupressure intervention was effective in reducing anxiety among patients undergoing hemodialysis.

**Conflict of Interest:** NIL

**Source of Funding:** NIL

**Ethical approval:** Research ethics committee of Maharishi Markandeshwar Deemed to be University Mullana, Ambala (MMDU/IEC/972).

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# Self Esteem and Peer Group Relationship of Adolescent Children in Single Parent Families

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## Abstract

As the family and its structure are in a descend form, children, especially adolescents may feel a sense of insecurity due to lack of proper care and support from their own imbalanced family system and other socialising agents. Therefore, the present study re-searches on the Self Esteem and Peer Group Relationship of adolescents from the Single parent families. This descriptive study emphasizes on Quantitative research, were the primary data was collected through the Survey Method using a questionnaire. The data was collected from two schools in Kollam District, Kerala, one from an aided school and another Government school and the sample size is 51 students from 8th to 12th standard. The tool consists of socio-demographic data, Peer Group Relation Scale by Hudson and Self Esteem Scale by Rosenberg. The study result shows as there is significant relation between Self Esteem and Peer Group Relationship of Adolescents from Single parent families.

***Key words**: Adolescents, Peer Group Relationship, Single parent family and Self Esteem.*

## Introduction

Sociological works on the family have long been dominated by two themes: Universality and Decline. The theme of Universality attests that the family exists in every single human culture. For various convincing reasons, individuals can't live as single animals nor would human be able to raise their young without anyone else as mother feline do. As a result, individuals live consistently in bunches containing grown-ups of both genders as well as children named as family and membership in the family are dictated by lineage and sexual associations(1).

The second subject in present day sociological work on the family is that, regardless of the universality of the family in current social orders, the family is in decline. Families are currently withered and unsteady, and the advanced family is progressively incapable to accommodate the prosperity of its individuals (1). Since, the family structure, preferably, gives a feeling that all is well with the world and security that is important for children. Be that as it may, the modern family is progressively unfit to accommodate the prosperity of its individuals. One of such change in the family structure is single-parent family. Single child rearing is a significant social issue that can make significant affect on a child's life. Consequently when there is a breakdown in the family structure, it might tremendously affect a child and their capacity to work usually.

In this modern world, children had to face and cross more complex and impersonal life today. Havighurst explained that the different types of problems faced by adolescents stem from pubescent development, their emotional life, the social groups with which the individual interacts, and other biological and cultural changes **(2).** Therefore any mishandlings in life's primary system itself will cause an interruption in an adolescent's life. Such malfunctions in the primary social system may even cause adverse effect on a child's mental

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development and wellbeing. This develops low self esteem in children and more attachment towards other social groups.

Now a day adolescents spend most of their time with their age group than they do with their parents and other adults. As children enter into adolescence, the amount of time they spend with peers' increases. Peer groups become the most important socializing influence on adolescent behaviour and values. Peer relationships serve as a bridge as adolescents move away from their parents and toward independent adult functioning [(3)].

Along these lines, the motivation behind the current study is to figure out the adolescents in single-parent families who have been separated from their parents either by the passing of a parent, separation or divorce. This investigation further attempts to understand the relationship between the self – esteem and the peer group relationship.

## Method and Material

This descriptive study emphasizes Quantitative research and Survey research design has been adopted to understand Self Esteem and Peer Group Relationship of adolescents from a single-parent family. The primary data for the study was gathered using a questionnaire using Survey Method.

The data was collected from two schools in Kollam District, Kerala, one an aided school and another Government school. Samples for the study were easily identified from the Snehapoorvam Scholarship list (Kerala Government Scheme for children of a deceased parent) and with the help of class teachers (identify children of parents who are either divorced or separated) and the sample size is 51 students from $8^{th}$ to $12^{th}$ standard.

The tool consists of socio-demographic data, Self Esteem Scale by Rosenberg, Peer Group Relationship Scale by Hudson. Statistical analysis of the present study was done by simple percentage and chi-square using SPSS 20 Version.

## Result

The gathered information from the review was based on their Socio-segment profile, level of Self-regard and on the size of Peer bunch relationship. The discoveries from the examination show that 80% of respondents in the investigation are from the age of 13 to14 years. Henceforth most of them are concentrating in eighth and 9thgrade. 71%of the respondents are young ladies and the greater parts among them are 67% among them are between 13-14 years. About half (51%) of the respondents are from semi-urban, 31% from urban and the rest 18% from a rustic setting. In Semi-urban settings, 88% are females while the rest are guys.

To recognize the idea of schools that the juvenile from a solitary parent family picked, the analyst gave accentuation on the kind of schools. From the discoveries, it was recognized that the greater part (59%) of the respondents are from Government School. Among those concentrating in a Government school, it is discovered that there is an equivalent extent of male and female. Alongside these fundamental subtleties, a request about their vehicle of guidance was likewise included, where the outcome appeared as 2/third of the respondents is from English medium schools.

Further, the researcher concentrated on the familial and parental details of the respondents like their relationship with the caretaker, work status, the explanation behind being a solitary parent, family type and the number of siblings. Measurable proof of the above details plainly communicates a rated show of caretaker's status as follows: respondents having mothers as guardian scores a level of 58.8%, though those having father are 41.2%. Because of the parent's work status, 82% showed their single-parent as employed, though 18% are jobless. The move-in present-day days family framework likewise reflected in the research, which is featured in discoveries where 67% have a place with Nuclear family and 23% live in a more extended family. Be that as it may, all the more shockingly 10 % of the respondents asserted themselves as living in a joint family.

On breaking down the explanation behind the parent's single status, the prime explanation was passing of the life partner (74.5%), while divorce and separation came as the second and third explanation separately. Respondents were likewise enquired about the number of siblings they have, therefore, 21.6% of respondents uncovered themselves a single child, where 66.7% of

respondents make them kin and 11.8% have 2 and more kin.

The respondents were asked to rate their parents' attitude towards them in certain situations like whether his/her parent is proud of them, do parent takes an interest in their activities, do his or her parent listen when the child talks, whether the parent is accessible when the child needs, whether the child can talk to his/her parent about the things that really matter and if the child can comfortably share his or her thoughts and feelings

The respondents were approached to rate their respondents' mentality towards them in specific circumstances like whether his/her parent is proud of them, do parent takes an interest in their activities, do his or her parent listen when the child talks, whether the parent is accessible when the child needs, whether the child can talk to his/her parent about the things that really matter and if the child can comfortably share his or her thoughts and feelings. All the respondents collectively evaluated "Always" as their reaction to the parents' attitude, which just implies that their single parent deals with them.

**Table. 1: Showing level of Self Esteem and Peer group relation**

| Self Esteem | Percent | Peer group relation | Percent |
|---|---|---|---|
| Low | 29.4 | Low | 25.5 |
| Medium | 47.1 | Medium | 52.9 |
| High | 23.5 | High | 21.6 |
| Total | 100.0 | Total | 100.0 |

From the table.1, we can infer that nearly half (47%) of the respondents have only below an average level of Self-esteem & whereas, on the other hand, 52.9% of the respondents shows above an average level of Peer group relationship.

**Table. 2: Test of association shows that there is a significant association with the type of the school respondents studied and the involvement of parent's interest in child's activities with the Self-esteem**.

| Sl.no | Variable | | Value | df | Sig. |
|---|---|---|---|---|---|
| 1 | Type of school | Govt | 7.719[a] | 2 | .021 |
| | | Aided | | | |
| 2 | Parent's interest in child's activity | Never | 9.508[a] | 4 | .050 |
| | | Sometimes | | | |
| | | Always | | | |

86.6% of respondents studying in the Government school showed a low level of self-esteem. Therefore the association test of Self-esteem with the type of school shows .021level of significance.

Meanwhile, the level of parent's interest in the child's activities showed more than 50% of positive response which figures .050 level of significant association with Self Esteem and Parent's Interest in Child's activities.

**Table. 3: Test of association shows that there is a significant association with the medium of instruction in school, no of siblings and respondents' comfort for sharing their thoughts with parent with Peer group relationship.**

| Sl.no | Variable | | Value | df | Sig. |
|---|---|---|---|---|---|
| 1 | Medium of instruction in school | Malayalam | 10.628[a] | 2 | .005 |
| | | English | | | |
| 2 | No of siblings | 0 | 10.575[a] | 4 | .032 |
| | | 1 | | | |
| | | 2 & above | | | |
| 3 | Comfort in sharing their thoughts with the parent | Never | 11.755[a] | 4 | .019 |
| | | Sometimes | | | |
| | | Always | | | |

60% of the respondents study in English medium, 66.7% of respondents has 1 sibling and 78.4 % of respondents always feel comfort in sharing their thoughts with the parent. In whole, respondents in the study showed only an average level of Peer group relationship with .005, .032 and .019 level of significant association with Medium of instruction in school, No of siblings & Comfort in sharing their thoughts with the parent**.**

## Discussion

The period of pre-adulthood is viewed as the frailest condition in every youngster's life. In consonance with this, a pre-adult from a solitary parent family can be considered as twofold powerless. Through this investigation, the researcher makes an endeavour to contemplate the Self-Esteem and Peer group relationship of the immature respondents' by causing them to assess their own life after the nonappearance of a parent. From the study results, it is been distinguished that almost 50% of the respondents have a place with the age of 13 and 14 years, who are concentrating in their eighth and ninth grade. Among the respondents, female members are lion's share in number and they abide in a semi-urban setting. Almost 60% of the respondents in this study are from the government school, concentrating in English medium and the sexual orientation extent in this area stayed equivalent.

According to census 2011 there are about 27 million female headed household in India which constitute nearly 10.9% of all household[(4)], there are 13, 58,698 single ladies in the state, while, in the 2011 statistics report, there is an ascent by 39 percent of single ladies in India [(5)]. · Like these reports, this investigation additionally features a comparative sort of result by demonstrating an expansion in the level of female overseers because of the demise of companion, separation and partition. Alongside these socio-demographic details, respondents were approached to rate their parents' contribution and effect on their day by day life, which indicated a pleasingly moderate reaction.

The test of association of the respondents' social and demographic details with Peer group relationship demonstrated a wide range of significant association with both. 87% of respondents studying in the Government school showed a low level of self-esteem, where girls outnumbered the boys. Though the study has not given more emphasis on the socio-economic conditions of the respondents, it can be construed that low self-esteem among the children with single parents studying in Government school is a result of low socioeconomic status, poor family background and environmental factors when compared to the students of aided schools[(6)]. The level of single parent's interest and involvement over children's activities showed a positive response to their parenting which can be tinted as an excellent reply to sabotage the conventional societal thought towards single parenting which is considered to be a social taboo or a curse.

Also while considering their Peer Group Relation, 60% of the respondents concentrate in English medium, 66.7% of respondents have 1 kin and 78.4 % of respondents consistently feel comfort in offering their musings to the parent. In entire, respondents in the examination indicated just a normal degree of Peer group relationship with significant association with Medium of instruction in school, No of siblings & Comfort in sharing their thoughts with the parent.

## Conclusion

Children who are at their pre- adulthood stage are very much vulnerable and unstable in handling healthy relationships and psychological wellness. So when it comes to the matter of children from single parent family, the risk doubles. For a positive quest towards this dormant social and psychological condition, they need unique consideration and support from Family, School, Communities and Government for a better Psycho-Social and Economic background. These support systems, where he / she involve may help the child to create a safe environment for a better future.

**Ethical Clearence** : Taken from Human Ethics Committee, Dept. of Social work, Amrita Vishwa Vidyapeetham, Coimbatore, India.

**Source of Funding**: Self

**Conflict of Interest**: Nil

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# Skin Cancer Classification Using Dermoscopic Images based on Ranklet Transform, Co-occurrence Features and Random Forest Classifier

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## Abstract

The skin cell which grows abnormally is known as skin cancer and it is caused due to sun rays in the uncovered skin. It spreads within a week, so the early diagnosis of skin cancer is required. Skin Cancer Classification (SCC) based on ranklet transform, co-occurrence features and random forest classifier is presented in this paper. Dermoscopic image in the PH2 database is used in this study for performance evaluation. Initially, the dermoscopic images of three categories normal benign and malignant images are preprocessed to smooth the images. Then the images are given to ranklet transform for decomposition. It produces subband coefficients. The Ranklet Features based Co-occurrence Matrix (RFCM) is used to extract the features and stored in database. The classification is made by Random Forest Classifier (RFC). The result shows better classification accuracy of 93.5% sensitivity is 92% and specificity is 95% is obtained by RFCM and RFC.

***Keywords:*** *Dermoscopy images, Ranklet transform, Co-occurrence matrix, Random forest classifier*

## Introduction

Skin cancer caused due to ultraviolet rays from sun light. Mostly all color peoples are affected by skin cancer and people with light color have a higher risk because the sun burn easily in the light skin. Melanoma classification using contourlet transform And naïve bayes classifier is described in [1]. At first, the input dermoscopic images are extracted by non-subsampled contourlet transform. Finally, the naïve bayes classifier is used to classify the melanoma images.

Automatic skin lesion detection and classification using dermoscopy images is described in [2]. Initially, the dermoscopic images are preprocessed by median filter to remove the hairs. After that the segmentation is made by k-means clustering. Then the features are extracted by subregion, color and text features. Features are selected by wilkis lambda method. The skin image classification is made by Support Vector Machine (SVM) classifier.

Skin cancer detection and classification using SVM is discussed in [3]. The input skin images are preprocessed by histogram enhancement and noise filtering. Segmentation of skin images is made by thresholding. The features are extracted by statistical feature extraction, border, diameter, color, asymmetry and Gray-Level co-occurrence Matrix (GLM). Then the features are selected by principal component analysis. SVM technique is used to classify the skin images.

Classification of skin lesion by novel regularizer and Convolutional Neural Network (CNN) is discussed in [4]. The input skin images are extracted by different layers of CNN. Classification is made by novel regularizer. Skin cancer detection using snake model and SVM is discussed in [5]. Initially, the skin images are extracted by snake model algorithm. The skin cancer templates are classified by SVM. Automatic SCC using multiclass SVM and GLM is described in [6-8]. At first, the input skin images are converted into grayscale. The features are extracted by GLM and texture features. Multiclass SVM is used for classification.

Skin lesion analysis using image processing technique is discussed in [9]. The input skin images are extracted by geometric features like diameter, border and asymmetric parameters. Classification is made by k nearest neighbor classifier. SCC for a robust approach is discussed in [10]. Initially, the input skin images are segmented by k means clustering algorithm. The features are extracted by local binary patterns and color coherence vector. Classification is made by multiclass SVM.

Melanoma skin cancer detection using dermoscopy images is described in [11]. Preprocessing is made by Gaussian filter to remove hairs in the skin. The features like color, irregularity, area and texture features are extracted. SVM is used for classification. Skin cancer nuclear segmentation using histopathological images is described in [12]. Initially, preprocessing is made by contrast limited adaptive histogram enhancement technique. Fuzzy clustering means algorithm is used for segmentation. The features extraction is made by elliptical descriptor analysis.

Classification and segmentation of melanoma skin cancer images is discussed in [13]. Adaptive linear filter is used for pre-processing to remove hairs in the skin. K means clustering is used for segmentation. Features like border, asymmetry, diameter and color variation are extracted. SVM classifier is used for classification. Early detection of melanoma for skin lesion classification is discussed in [14]. At first, image acquisition is made to convert the image into grayscale. The GLM features are extracted. Multiclass SVM is used for classification. Segmentation is made by k-means clustering algorithm.

An efficient method for SCC using ranklet transform, RFCM and RFC is presented in this paper. The organization of paper is follows: Section 2 describes the methods and materials used for SCC. In section 3 experimental results and discussion of SCC is presented. Section 4 concludes the SCC by ranklet transform based features and RFC.

## Methods and Materials

The overall workflow of SCC using ranklet features, RFCM and RFC is shown in figure 1. SCC system has three stages (i). Pre-processing, (ii). Feature extraction and (iii). Classification these stages are briefly explained below.

### Pre-processing using Wiener filter

The estimation of target random process for time invariant linear is made by wiener filter due to noisy process. It has an additive noise and noise spectra. Mean square error is minimized by the wiener filter between the random and desired process. Wiener filter is also used in processing of signals. Wiener filter used in other fields like image restoration [16] and video coding [15]. In this study, the input dermoscopic images are preprocessed by wiener filter to smooth the image and remove unwanted hairs in the skin.

### Feature extraction based on ranklet transform and RFCM

Ranklet transform is a non-parametric feature based on the non-parametric features and computation of Mann Whitney Wilcoxon in statistics domain. Ranklet has the similar form of Haar wavelets both has the same pattern of suitable notion of completeness, orientation selectivity and nature multiscale. The rank feature has high robustness in detecting the outliers and transformations like, gamma correction, brightness and contrast change.

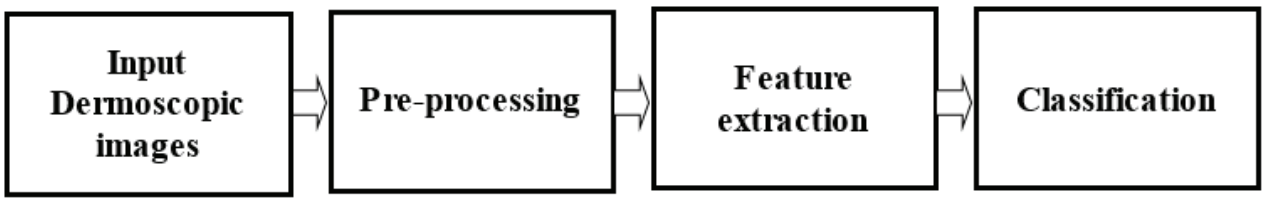



**Figure 1 Block diagram of SCC system**

The Wilicoxon ranket transform is defined by,

$$R_s = \sum_{m=1}^{K} \pi_m L_m \quad (1)$$

where $\pi_m$ is rank element of *m* and $L_m$. Then the Mann-Whitney statistics is defined by,

$$M = R_s - \frac{i(i+1)}{2} \quad (2)$$

where *i* is the no of treatment values. It is a statistical domain non-linear filter. The ranklets divides the image window *Win* into Two regions known as control and treatment which is shown in figure 2.

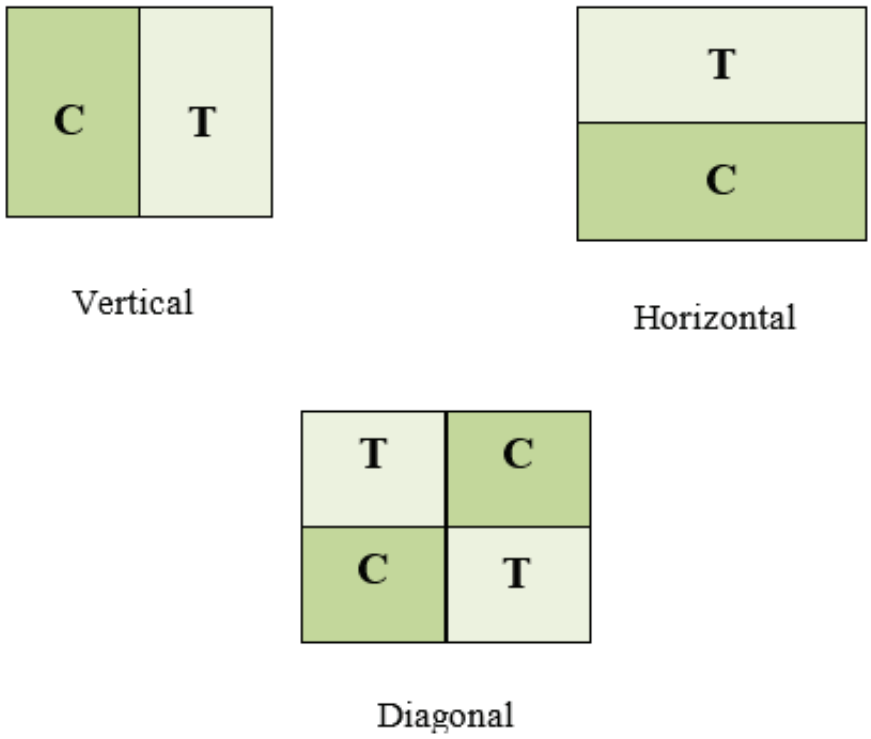



**Figure 2 Image Windows (*Win*) in ranklet transform**

The rank test statistics are employed to identify the variations in the given region samples in *Win*. The variations in each region are replaced by ranking scores. There is a pairwise comparison between the control and treatment regions. The variations are shown by the horizontal, vertical and diagonal shapes. The ranklet transforms counts the no of control and treatment pairs. The treatment values are brighter than the control values. The co-occurrence matrix is a statistical method the neighborhood values are accessed by the central pixels. Ranklet transform is also used in digital watermarking [17], mammogram classification [18] and texture classification [19]. In this study, ranklet transform is used to decompose the preprocessed images and produces the sub-band coefficients by different rank features. Then RFCM is used to extract the features and stored in the database for classification.

**RFC Classification**

RFC is an ensemble method for regression, classification and other tasks by constructing the multiple numbers of decision trees for the prediction of individual trees. Let us consider a decision tree combination of $\{M \ (k, \phi_i)\}_{i-1}^{R}$, where *k* is a input, $\phi_i$ is denoted as the random split of independent vectors which has equal distribution to other trees in a forest $\phi_1, \phi_2, \phi_3, \ldots \phi_{i-1}$. Here, *R* is the bootstrap of training data. Every tree is built by different bootstrap samples. The RFC algorithm

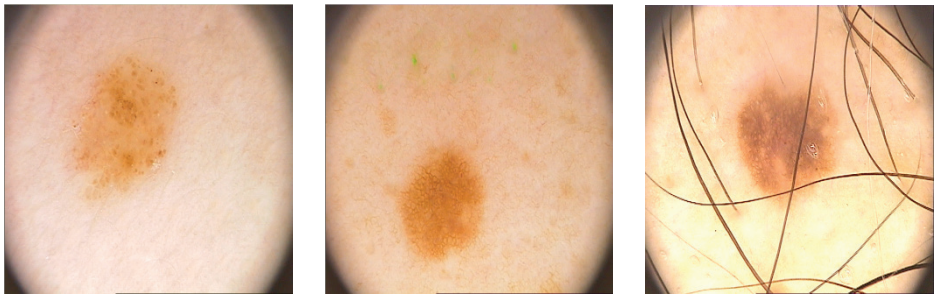
is defined by,

$$P(l)=1-\sum_{i-1} s^2\left(i/l\right) \quad (3)$$

Here $s^2\left(i/l\right)$ for $i = 1, 2,3,....n$ is the probability estimation for splitting the node. RFC is also used in the glaucoma image classification [20] and brain tumor segmentation [21]. In this study RFC is used for the classification of skin images.

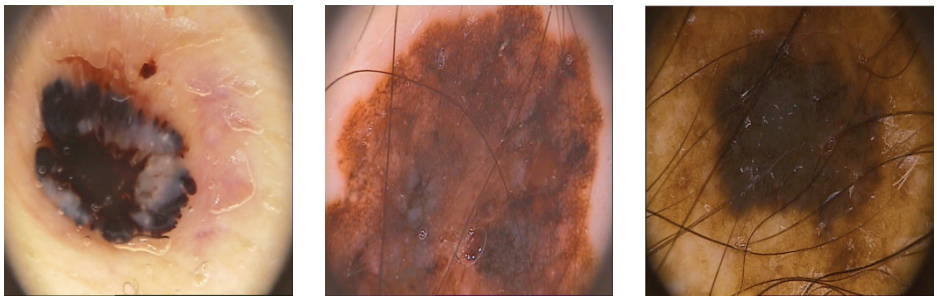
## Results and Discussion

The performance of SCC system is evaluated by PH2 database which is downloaded from PH2 database link [22]. Database contains 100 dermoscopic color image with lesions. The resolution of the image is 768x560 pixels. Figure 3 show the sample normal, benign and malignant images in the PH2 database.



(a) Normal

(b) Benign



(c) Malignant

**Figure 3 Sample images in PH2 database**

The input skin images are preprocessed by wiener filter to remove noise and hairs in the skin. Then the ranklet transform is given to preprocessed images for decomposition. It produces sub-band coefficients with different rank features. These different rank features are extracted by RFCM and stored in the feature database. Finally, classification is made by RFC. Figure 4 shows the Receiver Operating Curve (ROC) for SCC system using RFCM and RFC.

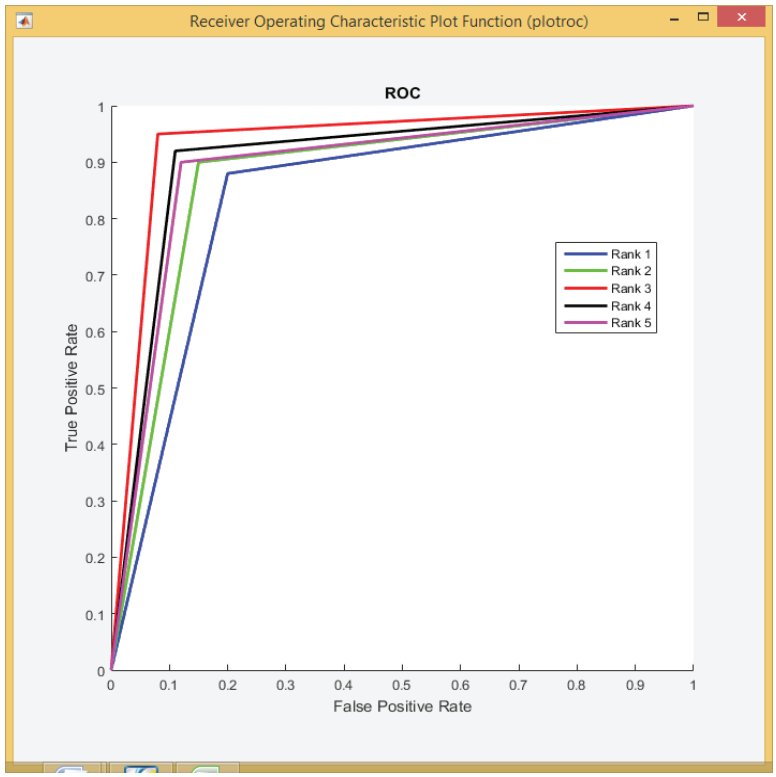



**Figure 4 ROC for SCC using RFCM and RFC**

From the above figure it is observed that, maximum area of 0.93 is obtained by ROC curve for 3rd rank feature. The minimum area 0.84 is obtained by the 1st rank feature by using RFCM and RFC. Figure 5 shows the performance metrics of the SCC system.

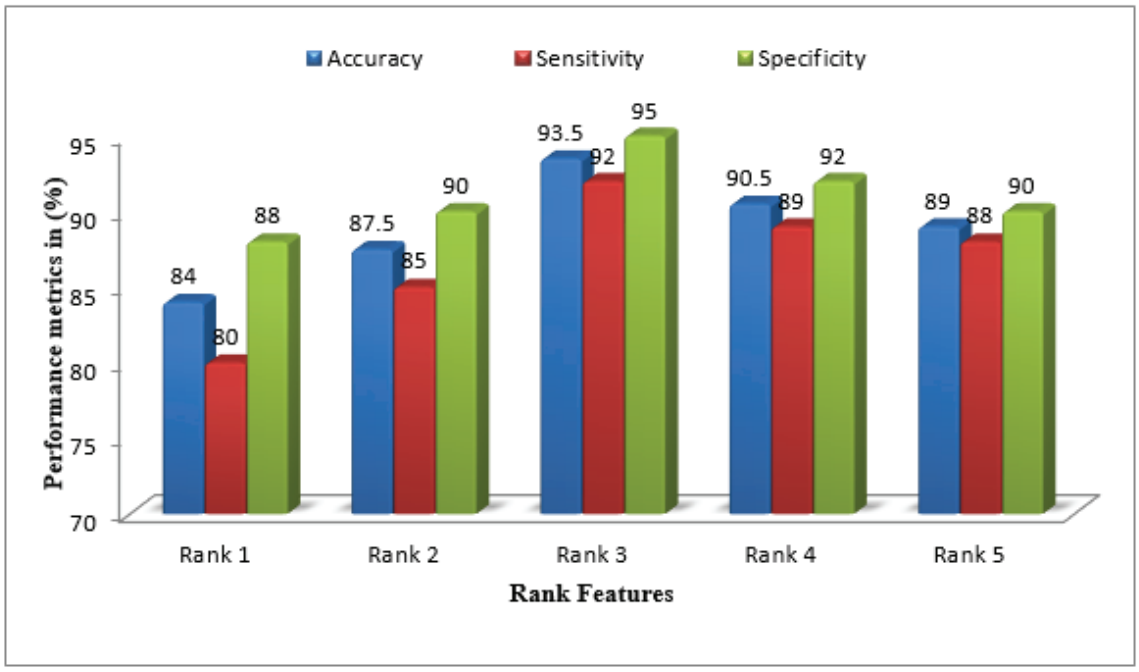



**Figure 5 Performance metrics of SCC system**

It is observed from the above figure the maximum classification accuracy of SCC system is 93.5 % at the 3rd rank feature by using RFCM and RFC. Also, the sensitivity is 92 % and specificity is 95 %. The minimum classification accuracy is 84 % obtained at 1st rank feature by using RFCM and RFC and its sensitivity and specificity are 80% and 88%. The classification accuracy is increased at first 3 rank features and decreased at last 2 rank features.

## Conclusion

The SCC system using ranklet transform, RFCM and RFC is presented. The dermoscopic images in the PH2 database are used for performance evaluation. The input dermoscopic images are preprocessed by wiener filter to remove noise and hairs in the skin. Ranklet transform is used to decompose the preprocessed images and produce subband coefficients with different rank features. Then RFCM method is used for extraction of subband coefficients with different rank features. These features are stored in the database and given as input for classification. The classification is made by RFC. Experimental results show the better classification accuracy of 93.5 % at the 3rd rank feature for SCC system.

**Ethical Clearance:** Taken from Annai Vailankanni Arts and Science College, Thanjavur, (Affiliated to Bharathidasan University)

**Source of Funding:** Self

**Conflict of Interest:** Nil

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# Melanoma Skin Cancer Classification Using Deep Learning Convolutional Neural Network

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## Abstract

In the recent years skin cancer skin cancer is emerging as one of the most complex diseases in which diagnosis is very challenging. Melanoma is generally characterized by the uncontrolled growth of body cells which might be caused due to prolonged exposure to UV rays produced by sun. Skin cancer can be categorized as basal cell carcinoma, squamous cell carcinoma and melanoma among which melanoma is considered as the most difficult to detect and if detected on time, melanoma is curable. Computer vision and Image processing toolboxes plays a pivotal portion in the field of medical imaging and diagnosis and is widely used. This paper focuses on a computer aided tool for skin cancer detection (i.e. melanoma). Dermoscopic images are used as inputs to the CAD system which is subjected to further image processing in which segmentation, feature extraction and classification is done to finally to differentiate between normal and melanoma images.

***Keywords:*** *Skin cancer, Computer Aided Diagnosis, Feature Extraction, Convolutional Neural Network*

## Introduction

Cancer is second is the ranked the second cause of worldwide deaths. Cancer is mainly caused by the uncontrolled growth and division of cells. A survey conducted by WHO shos that there are around 9.8 million deaths caused by cancer in the year 2018. Cancer is considered the cause of 1 out of 6 deaths throughout the world. In developing and poor countries (i.e. less and middle level income countries) nearly 70% of deaths are caused due to cancer. The human skin is the largest organ of the integumentary system and outer most covering layer of the body. Immunity which present in human skins plays a vital aspect or role in protecting our human body opposing to pathogens.

Skin cancer can be categorized as basal cell carcinoma, squamous cell carcinoma and melanoma among which melanoma is considered as the most difficult to detect and if detected on time, melanoma is curable. According to the WCRF (World Cancer Research Fund) survey in 2018, melanoma affects both men and women equally and also around 0.3 million of new cases were detected. The top countries which have highest levels of melanoma-skin cancer in 2018 (both male and female) are Australia, New Zealand, Norway, Denmark, Netherland, Sweden, Germany, Switzerland, etc.

Malignant melanoma is caused due to lesser amount of derma tint which is mainly caused by ultra violet (UV) rays from Sun (i.e.) pollution caused due to reduction in ozonosphere and exorbitant exposure to sun. The excessive use of cosmetics, radiation and pollution are major causes of skin cancer. Skin lesions can be categorized as either malignant or begnin based on various external characteristics as the nature of the lesion, whether the lesion is moving and also the size and shape of the lesion.

In paper [1], suggests the image segmentation process is performed based on snake active counter and support vector machine. It will help us to finding the parameters from SVM and Snake algorithm. To make the Snake algorithm effective appropriate selecting of the initial curve and snake parameters is done. The following shapes like rectangle, eclipse and curve are predicted by using the initial curve. In order to decrease the level of complexity, without any deterioration these shapes are chosen to keep the SVM implementation.

In testing the dataset, the images are used for template creation and also to determine the edges based on accuracy. These testing results of snake algorithms will show the finding of edge. To get the good results, segmentation and classification of these algorithms is required.

In paper [2] it describes about the detection the skin cancer from captured images of the affected tumor to determine the tumor is cancerous or normal. Diagnosis of melanoma at an early stage reduces the risk of death. Computer aided techniques will help the dermatologist to find out the skin cancer using image processing. In this work, graph cut algorithm type is used to detect the melanoma from the images and also the features like color, shape and geometry features are extracted from the images using image processing. Based on the extracted features, the images will be classified as malignant or benign stage by support vector machine using radial basis of kernel.

The paper [3] tells about the usage of segmentation of image based on lesion detection using deep learning of pixel wise labeling scheme. The architectural network is used for testing the public data and the ISIC database images are used for training. These results provide good accuracy rate and perform well even in the presence of hair, air and oil bubbles on images. The implementation of this process in GUI gives some additional weightage to the paper.

Paper [4] describes artificial intelligence and image processing techniques for melanoma detection. Image quality levels are improved by eliminating the noise in preprocessing stage. These skin images are segmented by applying the thresholding method. From that the features are extracted by2D wavelet transformation technique. These extracted features were applied as input for artificial neural network of back –propagation based and this method is used to classify their dataset into either cancer or non-cancer.

This paper [5] tells about the JSEG algorithm which was used to diagnose skin cancer by using the lesion boundary method.

In paper [6] the features like color and texture are extracted from gray level co-occurrence matrix (GLCM) and support vector machine (SVM) classifier which are used for classification and further diagnosis of malignant lesions. In this work, an accuracy level of around 90% by was achieved.

In paper [7] explains about the thresholding methods and maximum entropy methods, and these features such as correlations, energy, and unsymmetrical features are obtained from gray level co-occurrence matric [8-10]. And finally, feed forward and artificial neural network method is used for melanoma detection.

**Proposed Algorithms:**

The algorithm that is being proposed for the diagnosis of skin cancer is explained here.

- DB Image & Category Split/Count
- Load the Pre Trained Network
- Preprocess with CNN features
- Resize the Image & Visualize Weight
- Feature Layer &Train CNN Features by SVM
- Predict the Category with Trained Label
- Predicted Class & Accuracy finding

In our proposed scheme, melanoma classification is done through by using conventional neural network of deep learning technique. Here we are using the pre-trained network model for prediction and classification.

In this work, database contains melanoma and non-melanoma images which are separated from each other for analysis. These database images are split and number of images present in melanoma, non-melanoma is counted by their label or category wise and also the minimum number of images present in each class or type is identified. Then we load the pre-trained network model “Resnet-50” convolution neural network.

**Pre-Trained Deep Neural Networks**

We extract the powerful and descriptive features which are gathered from natural images using pre-trained image classification network. These pre-trained networks are trained by using the large scale visual recognition challenge using more than 0.001 billion images and then are classified into categories such as animal, car, bus, tea, cup etc.

**Resnet-50 (Network Model)**

It is also one of the type of pre-trained network model of Conventional neural network, it is trained by more than 0.001 billion images from the Image Net

database. This Resnet-50 pre-trained network which has 50 deep layers, classifies their corresponding database images into categories of 1000 objects. While loading the pre-trained network, it has some properties. In this pre-trained network, from input to output layer which has a huge number of fully connected layers or convolutional layers on path is known as network depth.

After loading the pre-trained network model, we go for image network classification (i.e. identify the prediction class) and preprocess the image on prediction class or label wise by CNN features. After that we resize the (i.e. 224 by 224) and visualize their weightage level. Then we initialize the feature layer of the pre-trained network model.

**Feature Extraction in Images on Pre-trained network model**

Without time investment and endeavor for complete network training, it's also a simplest and nimble approach for using the capability of deep learning technique. These features are extracted from images by using the pre-trained network and then it's trained by a classifier, like support vector machine (SVM).

**Test Image Features & Prediction**

Similarly, we can select the test or query image from any of the category in an image data store. We then resize the selected input image as per pre-trained network model (i.e. 224 by 224) and features are extracted from images by using the pre-trained network and then it's corresponding category is predicted by classifier and trained features, test features and trained labels. Finally, the classifier predicts the category and the accuracy rate are calculated from confusion matrix by taking the mean value of diagonal elements of confusion matrix.

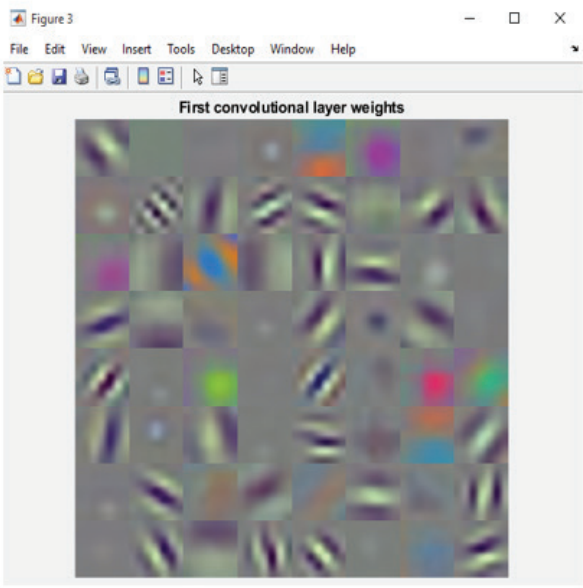


**Fig 1: Weighted Matrix**

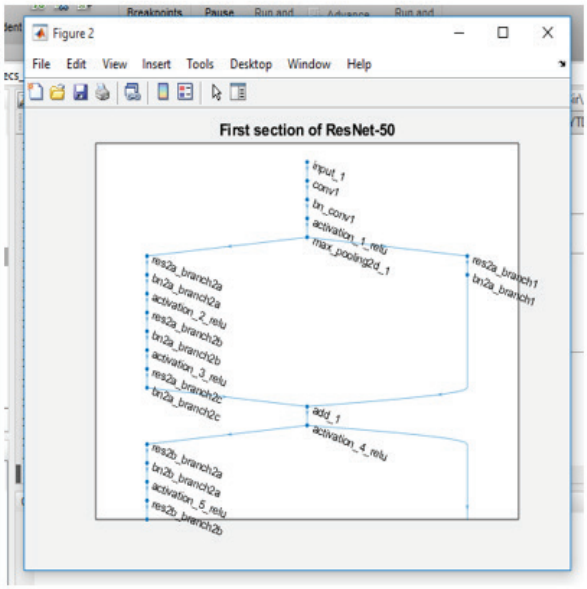


**Fig 2: Resnet-50 Layers**

Fig 1 & 2, describes about the Resnet50 (pre-trained network model) weightage allocation matrix & Layers connections

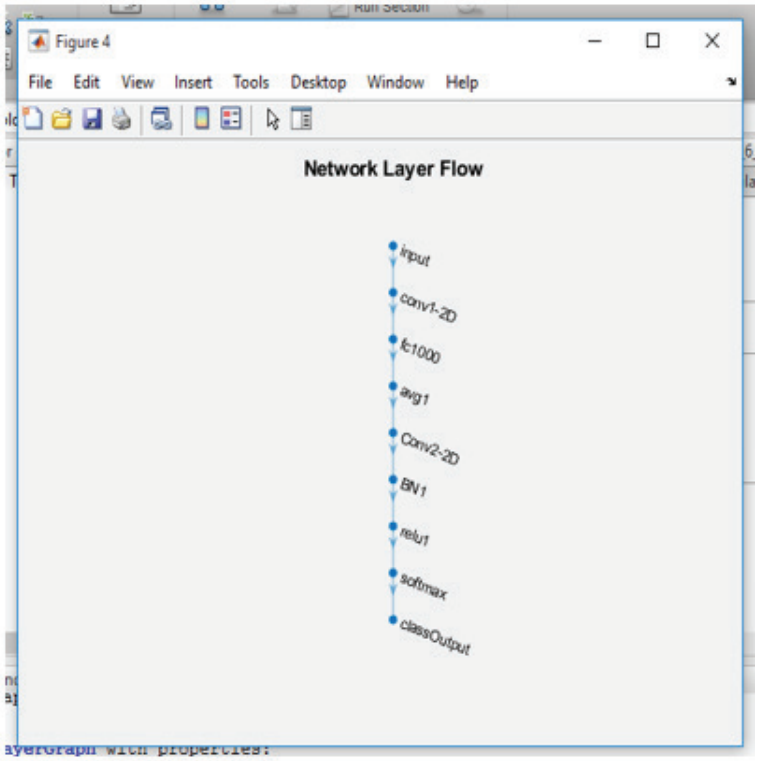


**Fig 3: Network – Layer flow**

Fig 3 describes about the Network Layer flow & class prediction by using classifier ofResnet50 (pre-trained network model)

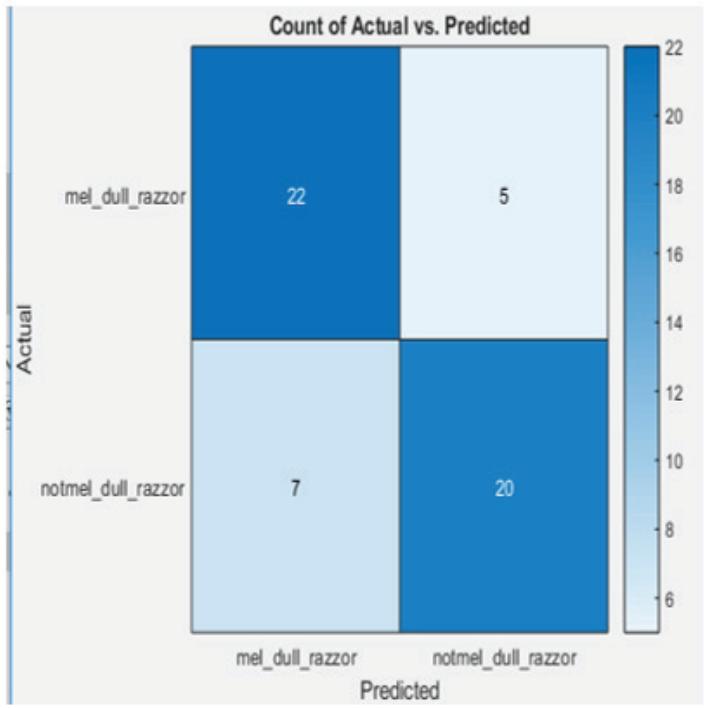


**Fig 4: Confusion Matrix**

**Fig 4, describe about our data prediction level for melanoma skin cancer classification by using Resnet50.**

## Conclusion

In this work, our aim is to finding the level of skin cancer in human body based on pre-trained network of (Resnet-50-categories of 1000 objects) model and CNN features. And these CNN features dataset and query image features are analyzed and its level is predicted by using deep learning, whether the query image which belongs to which category either melanoma or not. In our pre-trained network model (Resnet-50) getting 85.18 % accuracy. In future, creating the new network model can be done for skin cancer prediction.

**Ethical Clearance:** Taken from Indian Institute of Technology, Kanpur

**Source of Funding:** Self

**Conflict of Interest:** Nil

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# Cluster Analysis for MRI Brain Tumor Segmentation

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## Abstract

The abnormal tissues which are originated from the brain cells are known as brain tumor. It may be cancerous tumor or non-cancerous tumor; these can cause pressure inside the skull to increase the tumors. This damages the brain and become life-threatening. The main cause of brain tumor is still unknown. The early diagnosis is required otherwise it increases the mortality rate. The segmentation of tumor part is essential to identify the affected area in the brain. In this study, an effective method for Brain Tumor Segmentation (BTS) is presented. The BTS system uses Discrete Wavelet Transform (DWT), K-Means Clustering (KMC) algorithm and morphological operations for segmentation. Firstly, the input brain images are given to DWT for decomposition and it produces lower and higher frequency sub-band coefficients. Then the Inverse DWT (IDWT) is applied to reconstruct the image. The reconstructed image is given to KMC technique for segmentation. Then the unwanted regions are removed by morphological operations to detect the brain tumor in the given input image.

***Keywords:*** *Brain Tumor Segmentation, Discrete Wavelet Transform, Inverse DWT, K-Means Clustering*

## Introduction

BTS to calculate tumor percentage is described in [1]. Initially the input brain images are pre-processed by using median filter. Then the preprocessed image is given to segmentation algorithm like thresholding, watershed and cropping. Finally, the tumor area and brain area is calculated for the area percentage calculation. Dynamic Angle Projection Pattern (DAPP) features based BTS and classification using watershed algorithm is presented in [2]. Initially, the brain images are given to segmentation technique using watershed algorithm. Then the features are extracted by DAPP. Convolutional Neural Network (CNN) is used for classification.

Region growing approach based BTS to integrate symmetric property is presented in [3]. The brain images are given to geometric transformation and systematic analysis. Then the contrast stretching operation is performed and region growing operation is applied. Then the unwanted regions are removed by morphological operation to detect the tumor. BTS and detection for computer analysis is discussed in [4]. At first, brain image is given to preprocessing to remove noise. Then the preprocessed image is segmented by thresholding technique. Then the morphological operation is used to remove the unwanted regions. Windowing technique is applied to detect the brain tumor.

BTS method using U-net architecture is described in [5]. At first, the input brain image is given to loss function and optimized to perform the preprocessing and U-net model structure is used for segmentation. Then the feature recombination layer and convolutional layer are used for prediction. BTS for cuckoo search optimization algorithm is presented in [6]. Firstly, the input brain images are preprocessed by image acquisition, enhancement and preprocessing techniques. The map values are obtained by markov random field. The optimum thresholding algorithm is obtained by cuckoo search algorithm for segmentation.

BTS and classification for brain images using CNN is described in [7]. At first, the brain images are given to CNN for the prediction and segmentation of the affected area. Then the tumor area is separated. BTS based on features of separated local square is presented in [8]. Input brain images are given to image acquisition technique. The super pixels are segmented. Then features like statistical and texture features are extracted. Finally, the prediction is made by Support Vector Machine (SVM).

BTS using watershed and edge detection algorithm is discussed in [9]. The input image is converted into three different color formats. Then each region performs the contrast enhancement. Watershed transform is applied for each region. Then the three segmented region are combined to form the segmented image. Combined approach for BTS is described in [10]. The input brain images acquisition and pre-processed to remove noise. The gray level co-occurrence matrix and local binary pattern features and are extracted. Back propagation network is used for prediction.

Different wavelet analysis for brain image classification is described in [11]. The wavelet transform like Daubechies, symlet and biorthogonal wavelets are used for feature extraction. Then SVM classifier is used for classification. BTS using non-negative matrix factorization is presented in [12]. Firstly, the initial brain images are denoised by anisotropic diffusion filtering. Then the non-negative matrix factorization method and FCM is used for the feature segmentation.

BTS analysis using segmentation technique is presented in [13]. The brain image is acquiesced pre-processing technique using some filter. Then the segmentation is made by watershed method. Then the post processing also has done. Finally, the brain tumor area is detected. BTS for multimodal brain scans using expectation maximization algorithm is presented in [14]. The input brain images are pre-processed at first. Then the pre-processed brain image is segmented by using expectation maximization algorithm. Then KMC technique is used to identify the tumor region.

A novel method for BTS is presented in this study using DWT, KMC and morphological operations. The rest of the paper is as follows: In Section 2 the methods and materials used for BTS system is described. Section 3 describes the experimental results and discussions of BTS system. The BTS system using DWT, KMC and morphological operations is concluded in last section.

## Methods and Materials

Figure 1 shows the overall workflow of BTS system using DWT, KMC and morphological operations. Initially, the brain images are decomposed by DWT and IDWT is applied to reconstruct the brain image. Then KMC is used for segmentation. The unwanted background regions are removed by morphological operations to detect the tumor region.

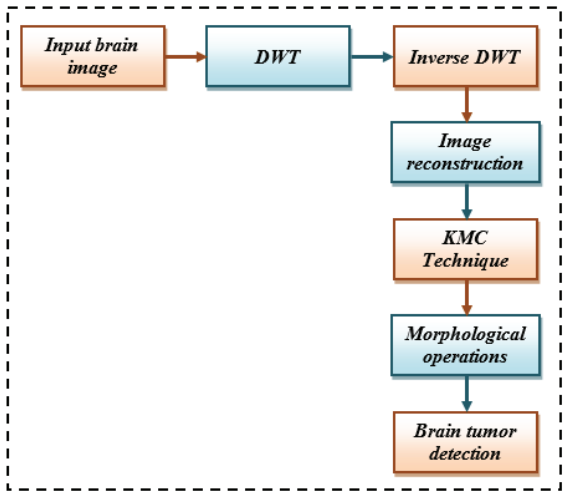


**Figure 1 BTS system – workflow**

### DWT Decomposition

The discretely sampled wavelets are known as DWT in both numerical and functional analysis. It has temporal resolution in a Fourier transform to capture both location and frequency information. DWT has large number of applications in computer science, mathematics, engineering and science. It produces familiar wavelet transform and produces the lower and higher frequency. DWT implements the rules under the translation scales and discrete set of wavelets. The discrete set of input images is decomposed into suitable size. The DWT is defined by,

$$\delta(k) = \sum_{m=\infty}^{\infty} (-1)^m P_{R-1-m} \psi(2k-m) \qquad (1)$$

where $R$ is defined as even integer, to decompose the set of wavelets. DWT is also used in other fields like object recognition [15] and speech emotion recognition [16]. In this study, the DWT is used to decompose the input images, then inverse DWT transform is applied to reconstruct the image.

### KMC Segmentation

KMC is a vector quantization method in processing an image for the cluster analysis in the data mining. The $n$ observations in $k$ clusters are belongs to nearest mean prototype. KMC has the cluster variances with irregular Euclidean distances. The geometric median minimizes the Euclidean distances in the optimized squared errors.

The Euclidean distances are minimized only by the geometric median. The convergence of efficient heuristic algorithm is local optimum. This algorithm is similar to expectation maximization algorithm for Gaussian mixture modeling. It uses clusters to model the data, and then KMC used to find the clusters in spatial extent. The expectation maximization mechanism allows clusters to have different shapes. The KMC is given by,

$$K(S)=\sum_{u=1}^{m}\sum_{v=1}^{m_u}\left(\left\|y_u - s_v\right\|\right)^2 \quad (2)$$

where, $\left\|y_u - s_v\right\|$ is Euclidean distance between $y_m$ and $s_v$, $m_u$ is the number of data points in $u^{th}$ cluster, $u$ is the number of clusters. KMC is also used in other fields like gene expression data [17] and tree identification [18] marine and rain removal images segmentation [19-20]. In this study, the reconstructed image is given to KMC for the BTS.

### Morphological Operations

The structural element in the morphological operation combines a 3 x 3 matrix. The neighborhood pixel values process the images into pixel by pixel. The morphological operation techniques are available for the gray level images or binary images. It performs operations like erode, reconstruct, dilate and other morphological operations. It process the images based on shapes. The value of the other pixel in the neighborhood is adjusted by morphological operations. The morphological operation is also used in other fields like licence plate localization [21] and shadow detection [22]. In this study, morphological operations are used to remove the unwanted region of brain.

## Results and Discussion

The performance of the BTS system is evaluated by REpository of Molecular BRAin Neoplasia DaTa (REMBRANDT) database [23]. The image size is 256x256 pixel resolutions. Figure 2 shows the some of the images in REMBRANDT database.

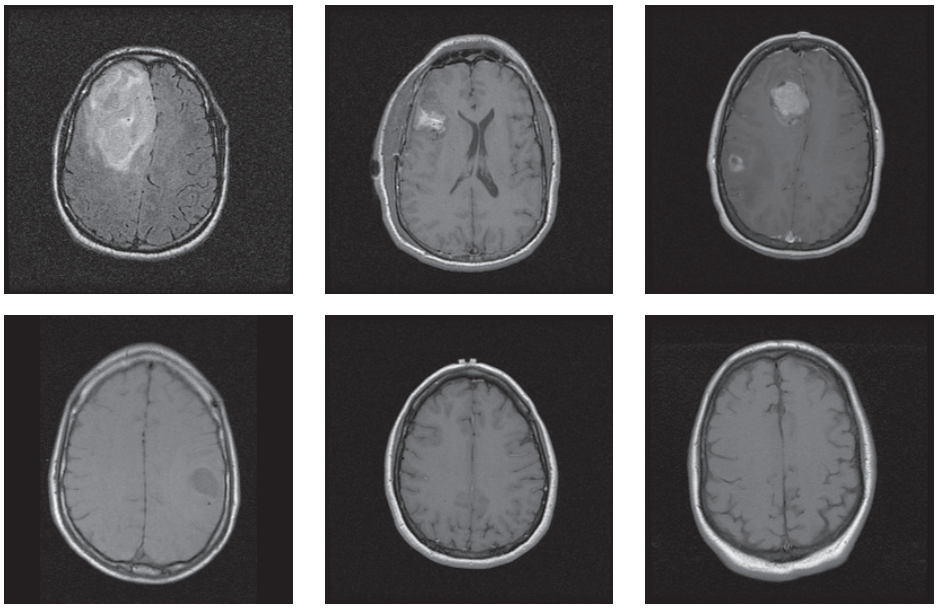

**Figure 2 Sample images in REMBRANDT database**

Initially, the brain image is given to DWT for decomposition, after that the inverse transform is applied for image reconstruction. Figure 3 and 4 shows the DWT decomposition and inverse DWT decomposition.

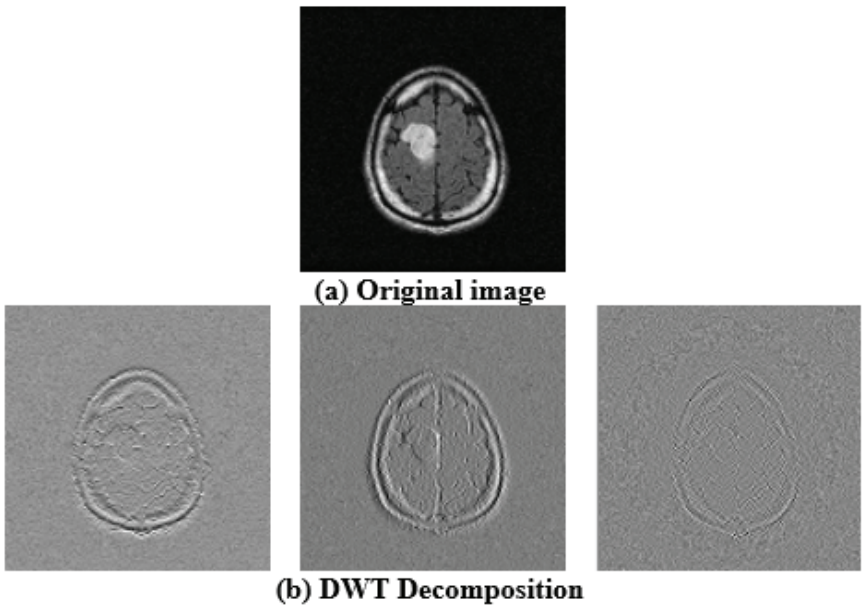


**Figure 3 DWT decomposition and its coefficients**

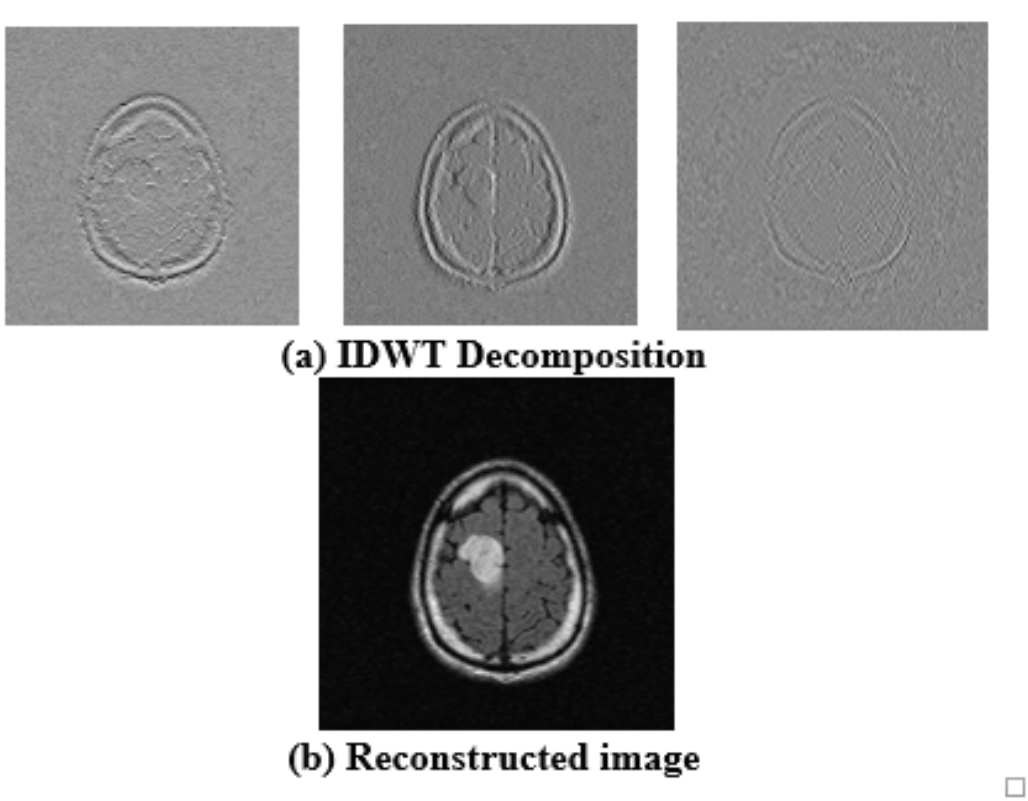


**Figure 4 Inverse DWT Decomposition and reconstructed image**

The reconstructed image is given as input for KMC technique for segmenting the tumor. Then the unwanted background areas are removed by using morphological operations. At first the reconstructed image is converted into grayscale image. KMC technique is applied for BTS. Then the morphological operations are used to remove the background region of tumor. Finally, the tumor is detected. Figure 5 shows the tumor detection using KMC and morphological operations.

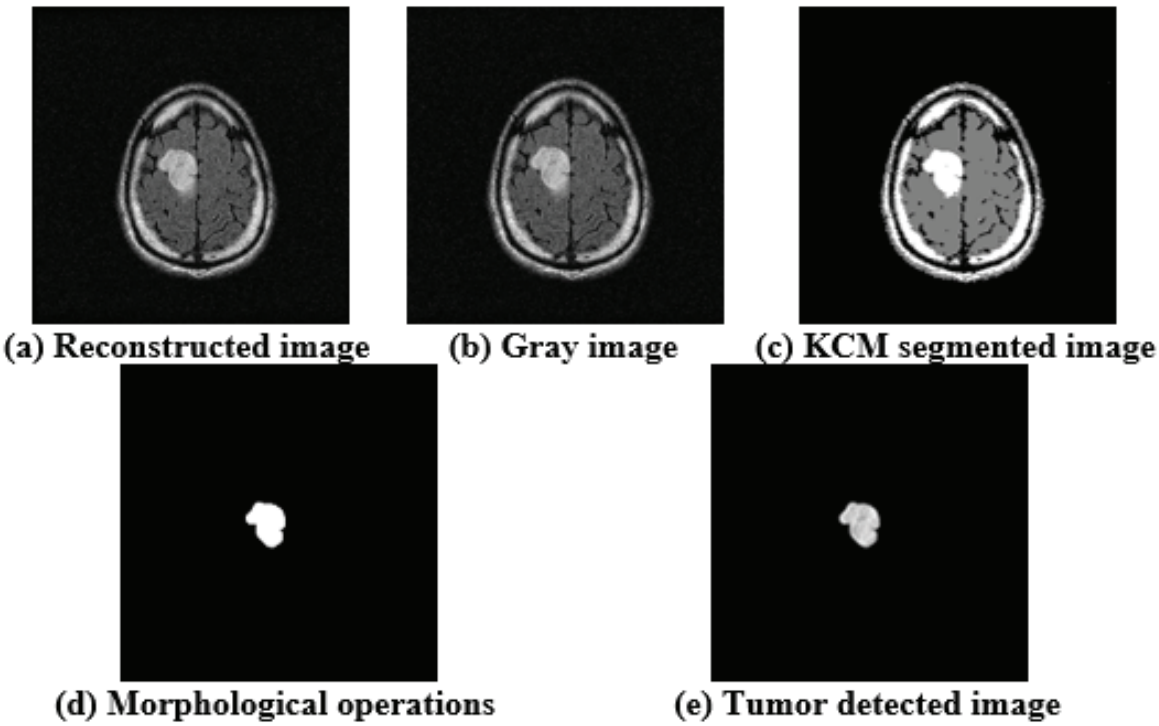


**Figure 5 Tumor detection using KMC and morphological operations**

## Conclusion

The cluster analysis for BTS system using DWT, KMC and morphological operations is discussed in this study. The performance evaluation of BTS system is made by using REMBRANDT database. The input image is given to DWT for decomposition and it produce sub-band coefficients and inverse DWT is also applied and it also produces the sub-band coefficients for brain image reconstruction. Then reconstructed brain image is converted into gray scale image then the KMC technique is used to detect the tumor region by using clusters for segmentation of tumor. Then the background region of brain image is removed by using morphological operations. Finally tumor region is detected.

**Ethical Clearance:** Taken from Hindustan Institute of Technology and Science, Chennai

**Source of Funding:** Self

**Conflict of Interest:** Nil

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# Effect of Posture on Electrical Axis of Heart During Different Phases of Breathing in Normal Subjects

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## Abstract

**Introduction:** Body postural changes are commonly used in the management of patients with acute cardiopulmonary dysfunction. Size, shape and position of heart are related to the body type, posture and respiration. Effect of change in body posture on electrical axis of heart has not been well documented. .The present study was conducted to study the effect of posture on electrical axis of heart during different phases of breathing in normal subjects.

**Aim:** To study the effect of posture on electrical axis of heart during different phases of breathing.

**Materials and Method:** With the help of INCO RMS Vesta 101 electrocardiograph, ECG was recorded in the following normal breathing, deep inspiration and deep expiration in supine, standing and sitting posture.

**Results:** The mean cardiac axis after deep expiration in supine posture was +47.29 degrees, in the sitting posture it was +32.67 degrees and in standing posture it was +30.69 degrees. The decrease in cardiac axis upon assuming sitting posture was significantly different from the value obtained during supine posture ($P<0.05$). The decrease in cardiac axis upon assuming standing posture was significantly different from the value obtained during supine posture ($P<0.01$).

**Conclusion:** It was found inter-individual variability in electrical axis of heart which can be explained on the basis of orientation of heart in the chest. In the present study, the decrease in cardiac axis due to postural variation from supine to sitting and standing was more pronounced after deep expiration. There was decrease in electrical axis of heart (shift to left) when subject changed the posture from supine to sitting and standing.

***Keywords:*** *Posture, Electrical axis, Breathing*

## Introduction

Electrical axis of heart or cardiac axis is altered in various physiological and clinical conditions, hence it is important to measure[1]. Body postural changes is commonly used in the management of patients with acute cardiopulmonary dysfunction[2]. Size, shape and position of heart are related to the body type, posture and respiration. Position of heart is determined by position and movements of diaphragm because the central tendon of diaphragm is firmly attached to pericardium. During deep inspiration, diaphragm becomes flat when it contracts. As it does, the heart descends, rotates to the right, moves backward and thus becomes more vertical, i.e. shift to right. During deep expiration, the diaphragm relaxes, elevates, and movements of the heart are converse to those occurring during deep inspiration. During normal breathing (eupnea), these changes are less pronounced. Effect of change in body posture on electrical axis of heart has not been well documented.

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Also this study has not been done in younger age group (20-30 years). So this study was undertaken to determine the effect of posture on electrical axis of heart during different phases of breathing. Even slight movements of the body disturb the analysis of cardiovascular dynamics[3]. The position of heart has an influence on the shape of ECG. Body changes from supine to standing posture and phases of respiration have been attributed to the changes in ECG[4]. In patients with cardiopulmonary dysfunction, change in body position is commonly used intervention. These changes in body position are often manifested as axis shifts in the ECG which results in ST segment changes. Hence can be misclassified as acute ischemic events during ambulatory monitoring[5, 6]. In a study conducted by Swenson et al (2011), they concluded that even a few centimeter changes in heart position were sufficient to produce ST-segment changes which mimic acute myocardial ischemia[7]. Hence, the axis shifts during postural changes have important clinical applications. The above concept has been proven in many studies. Likewise, Mohan et al (1987), Dougherty (1970) in their study stated that the body postural change produces the change in anatomical orientation of heart within the thorax resulting in alteration of cardiac axis[8, 9]. This statement is also proven by Ng et al (2001) who concluded that these postural variations produce changes in QRS amplitude, ST segment and T-wave inversions. But when compared to QRS shifts, P-wave shifts are larger and poorly correlated with QRS axis shifts[10]. Another study by Jones et al (2003) showed that postural variation from lying to sitting and standing postures produces decrease in RWA (R-wave amplitude) which is due to shift of axis to right. The other reason being change in cardiac volume[2]. Also Marín et al (1988) have stated that the R wave voltage varies with changes in heart position and the body mass is not an important modifier of RWA in light overweight, normal and thin individuals[11]. MacLeod et al (2000) have stated that the geometric position of heart could be a large source of variation in body surface potentials[12]. In another study, Swenson et al (2011) concluded that the variations in surface potentials are not only due to body postural changes but also due to changes in respiration[7]. Hoekema et al (1999) have commented that there is inter-individual variability of ECG in normal healthy subjects. Part of this variability is due to position of heart in the chest and also due to orientation relative to the electrodes. However the changes made in moving the electrodes did not reduce the inter individual variations[13]. Engblom et al (2005) have stated that, as age advances, change in electrical axis of heart is not by the change in anatomical axis. They concluded that there is no simple relationship between anatomical and electrical axes of heart[14]. Also in another study by Grant (1953), it was found that when the mean QRS axis changed to 180 degrees, the anatomical position of left ventricle changed only to less than 45 degrees[15]. Similar study done by Dougherty (1970) concluded that for every 1 degree change in position of heart, the QRS axis altered to 3 degrees[9]. Madias (2006) commented that the standard ECG recorded in supine and standing postures are interchangeable with stress ECG recorded in sitting, standing and supine postures[16].

## Aim

To study the effect of posture on electrical axis of heart during different phases of breathing.

## Materials and Method

This was a cross-sectional study done on 45 normal healthy volunteers conducted in the Department of Physiology, Mahatma Gandhi Medical College & Research Institute, Pondicherry. Prior to commencement of study, approval from Institute Human Ethics Committee was obtained. Young healthy volunteers in the age group of 20-30 years were recruited. The nature of the study and procedure were explained to them. Informed written consent was obtained from them. The selected subjects were instructed to come for recording the next day, about 2-3 hours after a light breakfast. With the help of INCO RMS Vesta 101 electrocardiograph, ECG was recorded in the following manner. The subject was asked to lie supine and completely relaxed in a couch for 10 minutes. Before fixing the lead, skin was thoroughly cleaned with spirit over the left and right wrists and ankles after which ECG jelly was applied. All four limb leads were connected. The subject was instructed not to perform any movement while recording was being made. ECG was recorded in lead I and lead aVF for about ten QRS complexes. Markings were made on the ECG strip at the beginning of normal inspiration and expiration. If there was any artefact, recording was repeated. This completed the recording of ECG in supine posture during eupnea (normal quiet breathing). Then the subject was asked to hold his/her breath after deep inspiration (breathe in deeply to full capacity). ECG was again recorded in lead I as well as lead aVF. Then the subject was asked to hold his/her breath after deep expiration (breathe out to full capacity). ECG was

recorded in lead I and aVF. This completed the recording of ECG in lead I and aVF in supine posture during eupnea, after deep inspiration and deep expiration. In the same manner, ECG in lead I and lead aVF was recorded in sitting as well as standing posture also. The recorded ECG was gathered and the mean QRS amplitudes were measured for deep inspiration and deep expiration. For eupnea, the mean QRS amplitude was measured for the QRS complexes which were marked after normal expiration. Cardiac axis was measured using Einthoven triangle. The mean QRS amplitude (net potential) was measured from lead I and lead aVF in ECG by subtracting S wave from R wave. This net potential was plotted on the axes of respective leads and perpendicular lines were drawn from each. The point of intersection of these two perpendicular lines was joined to the centre of the triangle to give the vector. This line represents the amplitude and orientation of QRS vector or electrical axis of the heart. The exact value of cardiac axis in degree was measured using protractor. Statistical analysis was done using SPSS software (version 16). The data was presented as mean ± SE and was analysed by using ANOVA. Intra group differences of means between supine and sitting, and supine and standing during eupnea, deep inspiration and deep expiration were compared using post hoc (ANOVA). The differences were considered statistically significant if probability of chance was less than 0.05 ($P<0.05$)

## Results

The present work was conducted in the department of Physiology, MGMC & RI with the principal aim to study the effect of posture on electrical axis of heart during different phases of breathing. The study included 45 healthy volunteers in the age group of 20 – 30 years. The mean electrical axis of heart during eupnea in supine posture was +55.84 (Table 1), in the sitting posture it was +47.51 degrees and in standing posture it was +49.33 degrees. The decrease in electrical axis of heart upon assuming sitting posture was not significantly different from the value obtained during supine posture ($P>0.05$). The decrease in cardiac axis upon assuming standing posture was not significantly different from the value obtained during supine posture ($P>0.05$). The mean electrical axis of heart after deep inspiration in supine posture was +70.18 degrees (Table 1), in the sitting posture it was +70.22 degrees and in standing posture it was +70.80 degrees. The increase in cardiac axis upon assuming sitting posture was not significantly different from the value obtained during supine posture ($P>0.05$). The increase in cardiac axis upon assuming standing posture was not significantly different from the value obtained during supine posture ($P>0.05$). The mean cardiac axis after deep expiration in supine posture was +47.29 degrees (Table 1), in the sitting posture it was +32.67 degrees and in standing posture it was +30.69 degrees. The decrease in cardiac axis upon assuming sitting posture was significantly different from the value obtained during supine posture ($P<0.05$). The decrease in cardiac axis upon assuming standing posture was significantly different from the value obtained during supine posture ($P<0.01$). Hence the present study inferred that the difference in electrical axis of heart during various postures was significant only after deep expiration ($P<0.01$) but not during eupnea and deep inspiration (Table 2).

**Table 1: Effect of posture on electrical axis of heart in various phases of breathing.**

| | **Eupnea (mean±SD)** | **Deep Inspiration (mean±SD)** | **Deep Expiration (mean±SD)** |
|---|---|---|---|
| Supine | 55.84±2.73 | 70.18±1.71 | 47.29±2.96 |
| Sitting | 47.51±4.16 | 70.22±2.87 | 32.67±3.79 |
| Standing | 49.33±3.68 | 70.80±2.33 | 30.69±3.74 |

Data represented as (mean±SD)

**Table 2: Level of significance of electrical axis of heart between supine, sitting and standing postures during eupnea, after deep inspiration and after deep expiration.**

| | **ANOVA (P value)** | | | **Post hoc (P value)** |
|---|---|---|---|---|
| | | Supine | Sitting | 0.267 |
| Eupnea | 0.227 | Supine | Standing | 0.406 |
| | | Sitting | Standing | 0.983 |
| | | | | |
| | | Supine | Sitting | 1.000 |
| Deep inspiration | 0.979 | Supine | Standing | 0.995 |
| | | Sitting | Standing | 0.998 |
| | | | | |
| | | Supine | Sitting | 0.011* |
| Deep expiration | 0.002** | Supine | Standing | 0.003** |
| | | Sitting | Standing | 0.917 |

*P<0.05, **P, <0.01

## Discussion

The present work was conducted to study the effect of posture on electrical axis of heart in different phases of breathing in young healthy subjects. The known concept of heart axis is that it varies from individual to individual, and also from time to time in the same individual. These variations are related to the body type, posture and respiration. In the present study, the electrical axis of heart in 45 normal subjects in different postures during different phases of breathing like eupnea, deep inspiration and deep expiration was compared. In the present study, it was found inter-individual variability in electrical axis of heart which can be explained on the basis of orientation of heart in the chest. The normal electrical axis of heart is generally said to be –30 to +110 degrees[17]. But in the present study on 45 normal subjects, the lowest value of electrical axis of heart was -21 degrees and the highest value was +135 degrees. Such "abnormal" axis may occur in some normal individuals. In such cases, thorough evaluation of all the parameters of ECG is to be made to exclude myocardial disease[18]. Though changes in electrical axis of heart were observed during different postures in the present study, they were not statistically significant. Other workers have observed that changes in body posture and movement lead to changes in cardiac axis[8–10]. In the present study, there was decrease in electrical axis of heart (shift to left) when subject changed the posture from supine to sitting and standing. Our observation is contrast to a study conducted by Jones et al (2003) in which the cardiac axis increased (shift to right) with postural variation from supine to sitting and standing postures[2]. In the present study, the decrease in cardiac axis due to postural variation from supine to sitting and standing was more pronounced after deep expiration. The probable cause for this could not be explained.

## Conclusion

It was found inter-individual variability in electrical axis of heart which can be explained on the basis of orientation of heart in the chest. In the present study, the decrease in cardiac axis due to postural variation from supine to sitting and standing was more pronounced after deep expiration. There was decrease in electrical axis of heart (shift to left) when subject changed the posture from supine to sitting and standing.

**Conflict of Interest:** Nil

**Source of Funding:** Self funded

**Ethical Clearance:** Obtained (Mentioned in methodology)

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# Effectiveness of Guided Imagery on Stress and Coping among Wives of Alcoholics- A Quasi Experimental one Group Pre-Test Post-Test Research Design

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## Abstract

Alcoholism is one of the major health and social problem all over the world. It is the third leading psychiatric problem in the world today. Addiction is a family problem and is a major source of stress for family members.

**Objectives**: 1. To assess and compare the stress and coping before and after administration of Guided Imagery among wives of alcoholics. 2. To determine the relationship between stress and coping among wives of alcoholics. 3. To determine the association of stress and coping with the selected variables among wives of alcoholics.

**Methodology**: Quasi experimental study with one group pre-test post-test design. A total 33 wives of alcoholics were selected by using purposive sampling technique. Tools: selected variables, Modified Perceived Stress Scale and Brief COPE Scale were used. Guided Imagery intervention was given daily for six days and each session was of 30 minutes which includes 5 minutes deep breathing exercise before and after the active session of guiding with focused background music. Daily guided imagery sessions were divided on different themes. Post test was taken on 8$^{th}$ day. Reliability of tool was estimated with Cronbach Alpha (internal consistency). The descriptive and inferential statistics were applied by using SPSS version 16.

**Results:** Kolmogorov Smirnov test was applied to check the normality of the data and data was normally distributed; hence parametric tests were applied. Findings of the study indicated that Guided Imagery was effective in reducing stress ["t"(32)=20.05 (p=0.00)] and improving the adaptive coping ["t"(32)= 6.91(p=0.00)] and reducing maladaptive coping ["t"= 6.87 (p=0.01)] among wives of alcoholics. There was significant moderate negative correlation between stress and adaptive coping and there was significant association of stress, adaptive coping and maladaptive coping with selected variables such as number of children, age, monthly income and type of family. Further multiple regression was performed to check the predictability of selected independent variables on stress. **Conclusion:** Guided Imagery was effective in reducing stress and improving adaptive coping among wives of alcoholics.

***Keywords:*** *Alcoholism**,** Wives of alcoholics, Guided Imagery, De-addiction.*

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## Introduction

Alcoholism was identified as a contributing factor in the deaths of 30 percent of those who died from alcohol poisoning from 2010 to 2012. (CDC). About 100, 000 people die each year from alcohol-related causes: drinking and driving crashes, other accidents, falls, fires,

alcohol-related homicides and suicides. (NCAAD).[1]

Addiction is a family problem and is a major source of stress for family members. Alcohol addiction causes family disruption as the addicted person ignores his responsibilities which further leads in disrupted family roles and impaired family communication.[2]

Stress is a common problem, so it is very important to learn how to identify stress and one must know about stress reduction techniques. Relaxation therapies help to reduce stress and in improving one's ability to cope with stress and stressful situations.[2]

## Methodology

A quasi experimental one group pre-test post-test research design was used for this study. Wives aged between 18 to 60 years, present at the time of data collection, willing to participate in the study and able to understand and speak Hindi, English and Punjabi were included in the study. The wives of alcoholics who were having no stress (scored 0 in perceived stress scale), suffering with mental illness and whose husbands had poly substance abuse without alcohol or abused with substance other than alcohol were excluded from the study. Thirty three participants were enrolled in the study with purposive sampling technique. Data was collected by using selected variables, Modified Perceived stress scale and Brief COPE scale.

**Description of Data Collection Tool**

***1. Description of Selected Variables:***

It consisted of 18 items related to selected variables such as age, religion, educational status of self (wife of alcoholic) and husband, occupation self and husband, monthly income (in rupees), Socio-economic class, place of living, duration of marriage, number of children, type of family, duration of husband alcohol use, duration of husband's stay in de-addiction centre, previous history of husband's stay in de-addiction centre, any other substance used, associated health problem/chronic illness (self) and (husband). The items were prepared with the help of literature, expert's opinions and investigators personal experience.

***2. Modified Perceived Standardized Stress Scale:***

A standardized scale was modified which consisted of 10 items with 5 point rating scale out of which 6 items were negative which was scored in direct order and 4 positive items was scored in reverse direction. The questions asked about the feelings and thoughts during the last month and were modified as the questions were asked about the feelings and thoughts during the last week. Tool was incorporated in the study after getting prior permission from the tool developer and the modification was done to be used in Indian setting.

**3. Brief COPE Scale:**

A standardized tool was used to assess the coping among wives of alcoholics. It consists of 28 items with 4 point rating scale (16 items of adaptive coping and 12 items of maladaptive coping). Interpretations were based on mean percentage for both adaptive and maladaptive coping. Higher the mean percentage resembles use of adaptive or maladaptive coping style.

**Procedure**

After obtaining the formal administrative approval from Chief Medical Officer of Civil Hospital Ambala city**,** final study data was collected from 9$^{th}$ September to 7$^{th}$ December 2017. Thirty three wives of alcoholics were selected by using purposive sampling technique from selected De-addiction centre of Ambala City, Haryana. Written consent was taken. On day 1 pre assessment was done by administering the tool selected variable, modified perceived stress scale to assess the stress and brief COPE scale to assess the coping with self-report (interview) technique. Guided imagery intervention was given daily for 6 days from day-2 to day-7. Application of GI was divided in three phases and each session was of 30 minutes which includes 5 minutes deep breathing exercise as a warm up, 5 minutes deep breathing exercise at the end and 20 minutes of guiding. Guided imagery was actively given by the researcher by her own voice in live session rather than recorded sessions. Guided sessions were divided on basis of different themes and were based on the previous research evidences. Themes: Day-1 Natural guiding for individual. Day-2 Natural guiding with loved ones. Day-3 Spiritual guiding. Day-4 Deep relaxation guiding. Day-5 Meditation guiding (to get rid of negative thoughts). Day-6 Individual choice. Accordingly on day-8 post assessment was done.

**Data Analysis**

**Descriptive statistics**

·Frequency and Percentage distribution to describe

selected variables.

· Range, Mean, Median, SD, and Mean Difference to describe in terms of stress and coping among wives of alcoholics.

**Inferential statistics**

· Paired't' test to check the pre-test and post-test score differences.

· Pearson's correlation to check the correlation between stress and coping.

· **ANOVA and independent 't' test to check the association**

· Step wise Multiple Regression to check the predictability of multiple independent variables on stress.

## Results

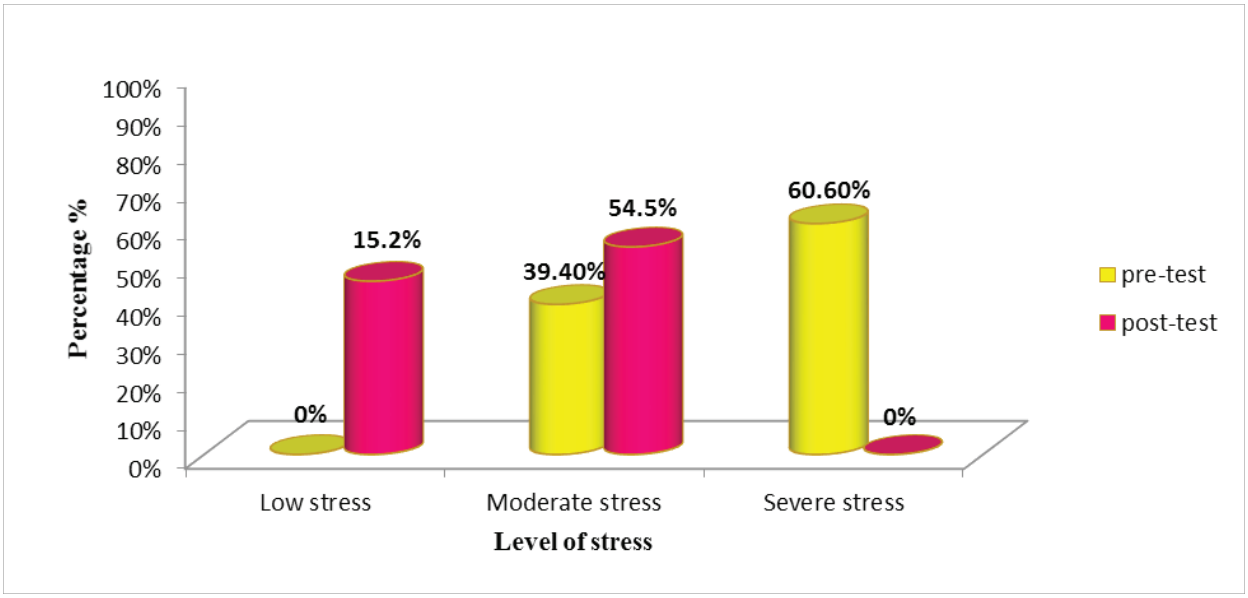


**FIGURE 1- frequency and percentage distribution of wives of alcoholics in terms of level of stress.**

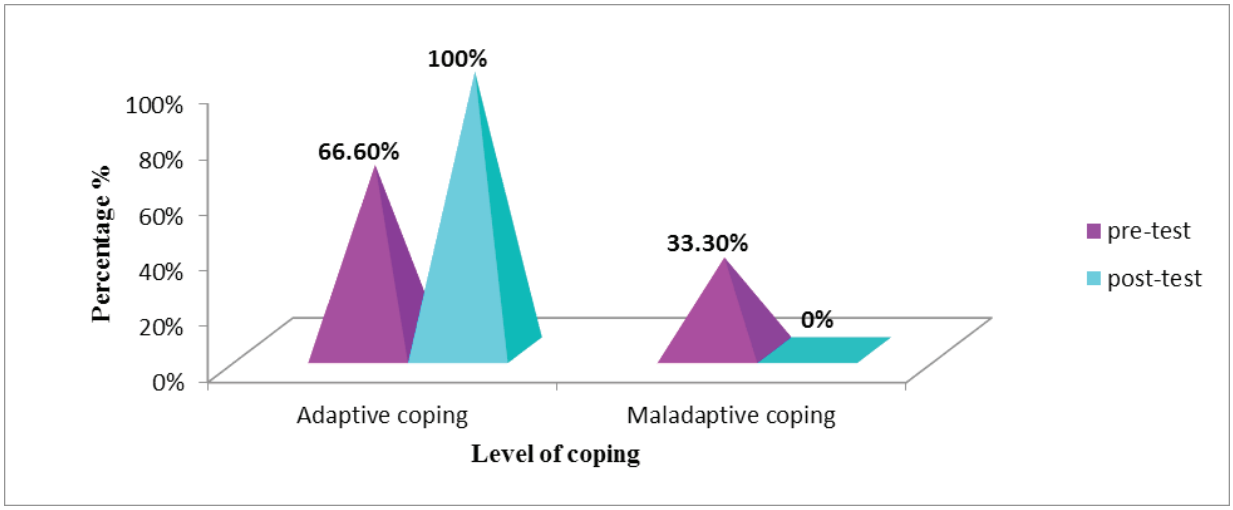


**FIGURE 2- frequency and percentage distribution of wives of alcoholics in terms of level of adaptive and maladaptive coping.**

**Table 1: Mean, MD, SD of difference, SE of mean difference and 't' value of stress and coping. N=33**

| Variable | Test | Mean ± SD | MD | SDD | SEMD | 't' value | df | P value |
|---|---|---|---|---|---|---|---|---|
| Stress | Pre-test<br>Post-test | 27.24 ±2.92<br>14.91 ±4.82 | 12.33 | 3.53 | 0.615 | 20.05 | 32 | 0.00* |
| Coping Adaptive | Pre-test<br>Post-test | 27.52 ±5.51<br>31.82 ±4.77 | 4.30 | 3.57 | 0.62 | 6.91 | 32 | 0.00* |
| Maladaptive | Pre-test<br>Post-test | 18.76 ±2.85<br>14.21 ±3.10 | 4.54 | 3.80 | 0.66 | 6.87 | 32 | 0.00* |

*Significant ($p \leq 0.05$) $t(32) = 2.037$

Above table-1, shows effectiveness of the Guided Imagery in reducing stress, increasing the adaptive coping and decreasing the maladaptive coping among wives of alcoholics.

**Table 2: Correlation between Stress and Coping among Wives of Alcoholics**

N=33

| Correlation | | Adaptive coping | Maladaptive coping |
|---|---|---|---|
| Stress | Pre-test<br>Post-test | -0.396(0.02*)<br>-0.458(0.00**) | -0.201(0.26)NS<br>-0.17(0.55)NS |

*- Mild/Weak negative Correlation * Significant ($p = \leq 0.05$)

**- Moderate Negative Correlation **Significant ($p = \leq 0.01$)

$r(31) = 0.291$ NS- Not Significant

There was positive association of stress among wives of alcoholics with number of children ($F=6.244$, $p=0.002$) {Wives who were having no children had higher mean (20.67) stress score than others}, adaptive coping with age ($F=4.304$, $p=0.013$) and monthly income ($F=3.964$, $p=0.008$) and maladaptive coping with type of family ($t=1.502$, $p=0.025$) at 0.05 level of significance.

Step wise regression analysis showing predictability of multiple independent variables (age and skilled worker - occupation of husband) on stress in pre-test (multiple correlation coefficient) table 3 which revealed that the age alone at 1st level of model had prediction with variability of 46.7% ($R^2=0.46$). When age is

combined with skilled worker – occupation of husband (reference group- unemployed) at 2nd level of model, then both variables combined had prediction with variability of 58.8% ($R^2$=0.58). Age alone had higher predictability in comparison to 2nd model.

**Table- 3: Step Wise Regression Showing the Predictability of Multiple Independent Variables on Stress (Multiple Correlation Coefficient) in Pre-Test N=33**

| Model | R value | R square | F value | d.f. | P value |
|---|---|---|---|---|---|
| Age | 0.68 | 0.46 | 27.16 | 1/31 | 0.000* |
| Age and Skilled worker (occupation of husband) | 0.76 | 0.58 | 8.77 | 2/30 | 0.006* |

*significant (p≤0.05)

Step wise regression showing predictability of Number of Children and any other substance used with alcohol on stress in post-test (multiple correlation coefficient) table-4. The number of children alone at 1st level of model had prediction with variability of 37.2% ($R^2$=0.37). When number of children is combined with any other substance used with alcohol at 2nd level of model, then both variables combined had prediction with variability of 45.8% ($R^2$=0.45) which means number of children alone had higher predictability in comparison to 2nd model.

**Table-4: Step Wise Regression Showing the Predictability of Multiple Independent Variables on Stress (Multiple Correlation Coefficient) in Post-Test N=33**

| Model | R value | R square | F value | d.f. | P value |
|---|---|---|---|---|---|
| Number of children | 0.61 | 0.37 | 18.37 | 1/31 | 0.000* |
| Number of children, any other substance used with alcohol | 0.67 | 0.45 | 4.75 | 2/30 | 0.03* |

*Significant (p≤0.05)

Regression coefficient was performed to check the predictability of individual independent variables (age and skilled worker - occupation of husband) in pre-test table 5. As there was predictability of age and skilled worker - occupation of husband in multiple correlation coefficient, the direction of predictability for variables is as if the variable at the first level of model when only age is included in the statistics, if the age is increasing in years by 1 point the stress level is decreasing by 0.2 points (-0.21). So when both the variables were combined at 2nd level of model, when age increases by 1 point then the stress among wives of alcoholics decreases by 0.24 points which is more in 2nd level of model as compared to 1st level of model and skilled worker as husband occupation (with unemployment as reference group) the direction of prediction for the variables is as if the skilled worker - occupation of husband is increasing by 1 point, then the stress in wives was increasing by four points (4.348).

**Table-5: Step Wise Regression Analysis Showing the Significant Predictability of Selected Individual Independent Variables on Stress in Pre-Test (Regression Coefficient) N=33**

| Model | Unstandarized Coefficients B Std Error | | Standarized Coefficients B | t | Sig. |
|---|---|---|---|---|---|
| 1.(Constant)<br>Age | 34.77<br>-0.21 | 1.49<br>0.04 | -0.68 | 23.28<br>-5.21 | 0.000*<br>0.000* |
| 2.(Constant)<br>Age<br>Skilled Worker<br>(Occupation of Husband | 35.55<br>-0.24<br>4.34 | 1.36<br>0.03<br>1.46 | -0.77<br>0.36 | 26.12<br>-6.40<br>2.96 | 0.000*<br>0.000*<br>0.000* |

*significant (p≤0.05)

Regression coefficient was performed to check the predictability of individual independent variable (number of children, any other substance used with alcohol) in post-test table-6. The direction of predictability for variables is as: if at the 1st level of model when only No. of children is included in the statistics: if the number of children is increasing by 1 point the stress level is decreasing by 2.4 points (-2.429). So when both the variables were combined at 2nd level of model, then number of children had less predictability as compared to 1st level of model. Any other substance used with alcohol, the direction of prediction is as: if the chance of consuming any other substance with alcohol is increasing by 1 point, then the stress in wives was decreasing by 3.5 points (-3.529) which further infers that if the husband uses any other substance with alcohol then the stress is decreasing among wives.

**Table-6: Step Wise Regression Analysis Showing the Predictability of Selected Independent Variables on Stress in Post-Test (Regression Coefficient) N=33**

| Model | Unstandarized Coefficients B Std Error | | Standarized Coefficients B | t | Sig. |
|---|---|---|---|---|---|
| 1.(Constant)<br>Number of Children | 19.69<br>-2.42 | 1.30<br>0.56 | -0.61 | 23.28<br>-5.21 | 0.000*<br>0.000* |
| 2.(Constant)<br>Number of Children<br>Any other Substance used with Alcohol | 19.81<br>-2.11<br>-3.52 | 1.23<br>0.55<br>1.61 | -0.53<br>0.30 | 16.06<br>-3.81<br>-2.18 | 0.000*<br>0.000*<br>0.003* |

*significant (p≤0.05)

## Discussion

In the present study, 60.6% wives of alcoholics were having severe stress, 66.6% were having adaptive coping and 33.3% were having maladaptive coping. These all findings was consistent with the findings of the study conducted by Nagesh V (2015)[3] where it was found that highest percentage 100% of the wives of alcoholics had Moderate stress, Further assessment of the overall levels of coping shows that highest percentage 98.33% of the wives of alcoholics were able to cope to some extent, 1% of wives were able to cope effectively.

In the present study, Guided Imagery was found to be an effective intervention in reducing stress among wives of alcoholics as there was significant reduction in stress score ('t'=20.056, p=0.00). This finding was consistent with the findings of the study conducted by Dell, Samuel's (2011) [4] where the results revealed that majority of the spouse of alcoholics [F(21,11)=1.05,p>.05] benefitted with the guided imagery technique to handle their life stress. Another study also well support the findings of present study conducted by James and Goldman's (2001)[5] where they found that Guided Imagery was effective in reducing stress among spouses of alcoholics. Further these findings are consistent with the study conducted by Divyabala S and Srinivasan P (2013)[6] which revealed that after intervention, there was a significant difference in the mean score of stress before and after guided imagery i.e the calculated 't' value was 19.613 and it was statistically significant at 0.05 level.

In the present study, Guided Imagery was found to be an effective intervention in terms of coping (adaptive coping 't'=6.91, p=0.00 and maladaptive coping 't'=6.87, p=0.00). This finding was consistent with the findings of the study conducted by vanitha rani, J Venkatesan and R Vijayaragavan (2016) [6] where the results of the study revealed that, the calculated 't' test value for stress ('t'=22.96) and coping ('t'=26.60) had a significant difference between the pre and post test levels of stress and coping among the caregivers of alcohol dependents at 0.05 level of significance.

In the present study, there was moderate negative correlation of stress with adaptive coping [r=-0.458, p=0.00]. The findings of the present study was partially supported by James and Goldman's (2001)[5] quasi experimental study where the study results (r(148) = .17, p =.07) revealed that there is a significant relationship between Guided imagery and intellectual life skill training and the stress reduction among the spouse of alcoholics. Another study also well supported the findings of present study conducted by vanitha rani, J Venkatesan and R Vijayaragavan (2016) [8] where the results revealed that there was moderate negative correlation between the post test scores of stress and coping i.e. r= -0.7 for both groups.

In the present there was significant association of number of children (p=0.002) with stress and type of family (p=0.025) with maladaptive coping. These findings of the study are consistent with the study conducted by Nagesh V (2015)[3] where they found that only age and number of children had significant association with perceived stress ($\chi^2_{(3)=}$ 8.67 and $\chi^2_{(3)=}$ 7.55) at 0.05 level of significance and in the coping type of family ($\chi^2_{(1)}$=5.455) had association.

## Conclusion

Guided Imagery was effective in reducing stress and improving adaptive coping among wives of alcoholics.

**Conflict of Interest:** NIL

**Funding Sources:** SELF

**Ethical approval:** The ethical clearance was obtained from university research ethics committee of Maharishi Markandeshwar University Mullana, Ambala (MMU/IEC/197) and the study was carried out in accordance with the guidelines laid by Indian Council of Medical Research ICMR(2006). The permission was taken to conduct the study in the De-addiction centre (from Chief Medical Officer of Civil Hospital Ambala city).

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# Predicting the Existence of Brain Tumor in Mri Images by Applying FCNN

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## Abstract

Brain tumors are major causes of death in today's world and methods of detecting them prematurely require vast improvement. The objective of this project is to detect the tumors early from MR image scans by utilizing deep convolutional networks to locate the tumor.The tumor is divided at first in the main stage and the generated bounding box is utilized for the center of the tumor in second step. This is trailed by division based on the bounding box of the tumor center division result. Examinations are performed with the BraTS 2017 validation set. This is a numerous division issue.

***Keywords:*** *Image processing, Machine learning, Deep Learning, Neural Networks, Fully Connected Convolutional Neural Networks, Image Segmentation, Tumor Detection, HGG, LGG, Convolutional Layer.*

## Introduction

Brain Tumors are one of the world's leading causes to high increase in mortality rate. Detecting tumors has always been a challenge to doctors. Predicting tumors in the brain has always been a hit or miss situation with most of the predictions being less accurate. To mitigate this problem and increase the accuracy we propose an automated solution by utilising image processing and segmentation techniques by which the rate of predicting tumors could be improved.

In this paper, we discuss about the various utilizations of CNN in the field of medical imagery and detection of brain tumors from Magnetic Resonance (MR) images. Convolutional neural network has demonstrated their fortitude in the field of Image Processing and Segmentation. The results provided by convolutional neural networks are reliable and accurate. The methods by which Deep Convolutional Neural Networks can be applied to the problem of predicting the existence of tumors in the brain is explained and discussed in detail. The images utilized for validation of our model is the BraTS 2017 MRI scan images.

In study conducted by Ronneberger et.al., they suggested a method of utilising a FCNN to segment the given images utilising the sliding window protocol to mark the region of interest in the image and later classify the provided images as scans of patients with cases of tumor and patients without tumor.[1] This method was promising as it was able to accurately predict the classifications.

In this paper, authors devised an innovative method in training the convolutional neural network by releasing Tensor Layer a high-level module that allows to extract the operations towards neuron layers, network models and dependent training jobs.[2] It offers a basic yet advanced interface enabling developers to implant low-level controls with a backend motor. It is profoundly versatile and gives an unrivalled performance.

In this paper, a method proposed for an automatic and reliable segmentation approach based on CNN by exploring small 3 x 3 kernels.[3] The utilization of small kernels permits developing more profound architecture other than evacuating the plausibility of over fitting

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given the smaller number of loads in the system. Through examination strategies including both CNN-based division techniques with information, enlargement demonstrated to be exceptionally powerful for MRI pictures.

The authors of this paper proposed a method to utilize K-means algorithm for color-based segmentation. In their proposed strategy, the procedure is utilized to follow tumor objects in MR brain pictures.[4] The procedure includes the transformation of given grey level MR pictures into a color space picture and separates the position of the tumor object from different things of MR picture utilizing K-means bunching and histogram clustering.

In this study, Pham et al. presented a critical appraisal and comment on the various automated and semi-automated methods for segmentation of anatomical medical images.[5] Current advances in segmentation approaches are viewed on basis of their respective advantages and disadvantages respectively.

In this paper, authors have described a methodology by which the brain scan is retrieved from the patient's database during which the noise and artifact of the image are removed.[6] This method utilizes HSom for image segmentation which is used to classify an image row by row. It improves on computational speed and ensures that noise is very less in the image before classification.

In this study, Kaus et al. proposed a mechanized brain tumor division approach which was trained and tested against manual division strategies with three-dimensional MR images with MGG and LGG.[7] The proposed strategy permitted quicker identification of brain and tumor tissue with great preciseness and reproducibility comparable to manual division.

In this paper, the authors have proposed a technique for detection of tumors in digital mammography.[8] This technique involves two strategies, division by which regions of intrigue are extracted from pictures by adaptive thresholding. By using an altered Markov Random Field-based strategy division is done precisely. The classification was done on the segmented images by a fuzzy binary decision tree to get accurate results.

In this work, Sharif et al. described the advantages and disadvantages of utilising Convolutional Neural Networks based on a series of classifications performed on ILSVRC13 dataset utilizing the over feat network model for object classification.[9] They conclude that convolutional neural networks are the best for image classification and object recognition tasks.

The authors of this work presented a flexible framework for object instance segmentation.[10] This strategy at the same time recognizes objects of interest and furthermore produces a great division cover for each example. This technique is named Mask R-CNN which expands Faster R-CNN by including an expectation branch alongside the current branch for bounding box acknowledgement. It is anything but difficult to prepare and doesn't include any computational overhead since it works in parallel with the current procedure.

In this work, Ren et al. proposed a methodology called Region Proposal Network which offers full-image convolutional features with the discovery network enabling nearly cost-free region.[11] An RPN is an FCN that all the while predicts object limits and objectless scores at each position. RPNs are prepared end to end to create top-notch locale recommendations, which are utilized by Fast R-CNN for identification. The preciseness of this model is significantly higher contrasted with different models and the ideal opportunity for preparing is likewise less contrasted with the nonexclusive convolutional neural net models

The authors discussed a methodology of extending the pre-existing CNN architectures in this paper for the purposes of medical imaging.[12] The method of annotating images and training the images on a convolutional neural network is discussed in great detail in this paper.

In this paper, Krizhevsky et al. discussed a method by which overfitting can be prevented in convolutional neural networks by employing a regularization method while training the network on high resolution images in the LSVRC-2010 ImageNet training set on 1000 different classes.[13]

In this study, creators have talked about an enhanced adaptation of image object identification and acknowledgement with a neural algorithm of artistic style that can isolate and recombine the picture substance and style of the normal image.[14] The algorithm enables new bits of knowledge to profound picture portrayals

learned by Convolutional Neural Networks and exhibit their potential for high-level image synthesis and manipulation.

The creators of this work explained the utilization of the 100-layer Tiramisu design for the division of cerebrum tumor from multi-modular MRI, which is developed by coordinating a densely connected FCNN, followed by post-handling utilizing a Dense Conditional Random Field (DCRF).[15] The system comprises of squares of thickly associated layers, progress down layers in down-examining way and change up layers in up-inspecting way. The proposed system accomplishes a mean entire tumor, tumor center and dynamic tumor dice score of 0.87, 0.68 and 0.65. Separately on the BraTS '17 approval set and 0.83, 0.65 and 0.65 on the Brats '17 test set.

## Material and Method

The comparative analysis utilizes a FCNN for the purposes of segmentation of the input image and several classifiers to get predictions on the possibility of a patient having a tumor. The additional classifiers were added to check for the possibility of increased accuracy in the prediction scores. The input image is fed into the FCNN and allowed to train on the network for 150000 epochs. At the end of the training process the image is segmented. The Convolutional Neural Network is able to extract features from the images. Each layer's output serves as an input for the other layer and so on. The implementation is done by using Keras framework with TensorFlow backend. To save time in training the network, both the LGG and HGG images are trained simultaneously on the network. The proposed method gets the confidence score from the FCNN and the confidence values are then fed into the above-mentioned classifiers to get an accurate prediction. The segmentation of the images results in accurate region localization of the tumors present in the scans. The results obtained are then fed into the rudimentary classifiers for post-processing and getting an accurate result. Figure 1 is the process flow of the proposed network for one epoch. The result of segmentation for one image is tabulated as follows in Table 1.

**Table 1: Values for Tumor Score Measures**

| **Volume ID: HGG/Brats17TCIA3741** | |
|---|---|
| **Measure** | **Value** |
| Dice Complete Tumor Score | 0.8921 |
| Dice Core Tumor Score | 0.8914 |
| Dice Enhancing Tumor Score | 0.8379 |
| Sensitivity Complete Tumor Score | 0.9906 |
| Sensitivity Core Tumor Score | 0.9331 |
| Sensitivity Enhanced Tumor Score | 0.7697 |
| Specificity Complete Tumor Score | 0.9966 |
| Hausdorff Complete Tumor Score | 10.2956 |
| Hausdorff Core Tumor Score | 7.8102 |
| Hausdorff Enhancing Tumor Score | 9.0554 |

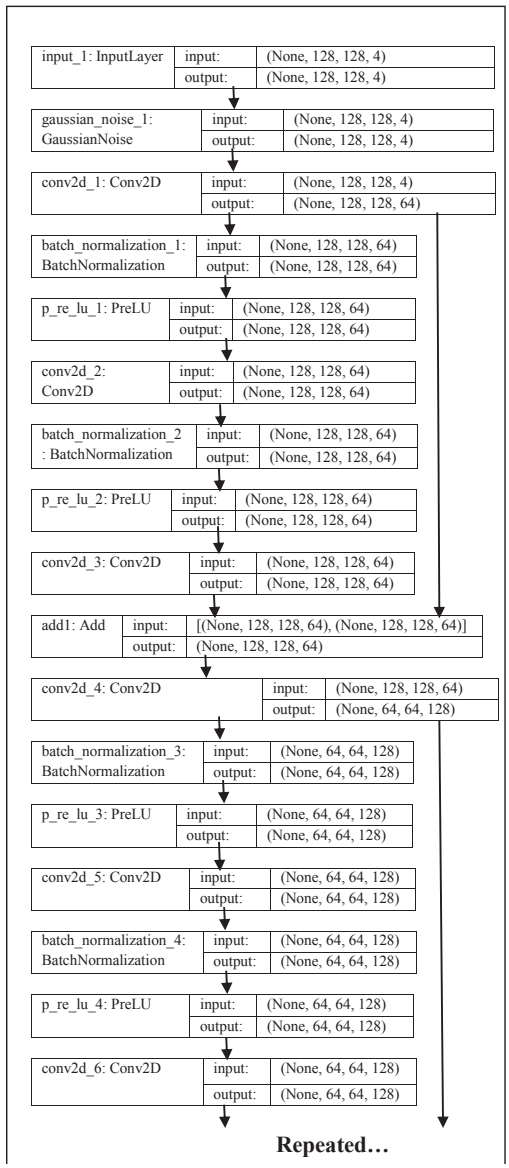


**Figure 1: Process Flow of FCNN**

The process of classification begins after each image is iterated through and the individual scores are saved as a csv file for further classification process as shown in Algorithm 1. The results from the CSV are then fed as input into five different classifiers.

**Result:** Preprocessed Images with csv for training network

Step 1: Extract Images

Step 2: Prepare for downsizing

Step 3: Split into training and test images

Step 4: Input images into FCNN

**while** images present **do**

Step 5: Calculate Dice Score

Step 6: Calculate Specificity Score

Step 7: Calculate Sensitivity Score

**if** Scores **then**

Step 7: Write to CSV

Step 8: Feed into SVM, KNN, and other algorithms for classification

**else**

continue

**end if**

**end loop**

**Algorithm 1:** Algorithmic representation of methodology

By using the CSV that was generated by the previous stage of processing we first make a threshold level for the results (refer Algorithm 2). By considering the specificity and sensitivity values we label the classes as tumor and benign. The results of the classification are expressed in terms of accuracy, precision, F1-score and recall.

**Result:** Precision, Recall, F1 score and accuracy

Step 1: Read CSV

Step 2: Split into train and test images

Step 3: Input data into KNN

**while** *Algorithm* **do**

Step 4: Print Precision score

Step 5: Print Recall score

Step 6: Print F1-score

**if** *Scores* **then**

Step 7: Plot respective graphs

**else**

continue

**end if**

**end loop**

**Algorithm 2:** Process of getting predictions from various algorithms

## Findings and Discussion

The following results are inferences which were got from the various classifiers utilized. Performance of the classifiers are measured by using standard measures like accuracy, F1-score, precision and recall.

Figure 2 describes the accuracy score of the various classifiers plotted on a bar-graph to show the best of the five chosen classifiers. Preciseness is one metric for assessing arrangement models. In our analysis Decision tree classifier was able to get a better accurate prediction while comparing the other classifiers. Multilayer perceptron performed the second best in accurately classifying the provided data samples.

Figure 2 also describes the precision score of the various classifiers plotted on a bar-graph to show the precision of the chosen five classification algorithms. Precision score is highest in Decision Tree Classifier and Multilayer Perceptron Classifier proving for the second time that these classifiers perform well for our testing dataset.

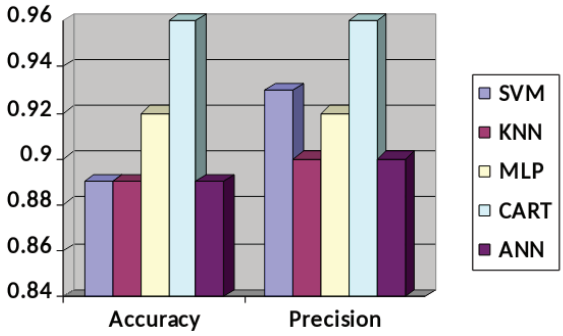


**Figure 2: Accuracy and Precision Charts for the Used Classifiers**

Figure 3 portrays the F1-score of the different classifiers plotted on a bar graph to show the F1-score of the picked five grouping calculations. F1-score is most noteworthy in Decision tree classifier and Multilayer Perceptron classifier. These classifiers are appropriate for our testing dataset.

Figure 3 also describes the recall-score of the various classifiers plotted on a bar-graph to show the recall score of the five classifiers used in this experiment. Recall-score is highest in Decision tree classifier and Multilayer Perceptron classifier. These classifiers are well suited for our testing dataset. From these results we can conclude that we can utilize a decision tree classifier or a multilayer perceptron classifier to augment the results obtained from the Fully Connected Convolutional Neural Network Architecture.

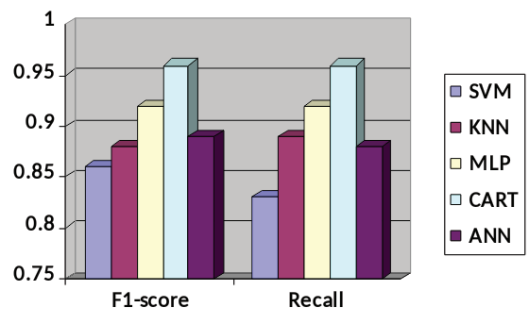


**Figure 3: F1-Score and Recall Charts for the Used Classifiers**

## Conclusion

We have discussed a method of improving the accuracy and precision of predicting a tumor present in the BRATS2017 Brain Scan images by utilising a FCNN to segment the image and further classify and predict using the rudimentary classifiers like SVM, KNN, CART and ANN. This combined methodology reduces the time taken to train and predict the tumor and provides a considerably accurate prediction. The results that we obtained show that utilising a decision tree classifier (CART) to augment the FCNN architecture results provides the best performance metrics.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Source of Funding:** Nil

**Ethical Clearance**: Nil

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# Effect of Video based Teaching on Knowledge and Attitude regarding ADHD of Children among Primary School Teachers

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## Abstract

**Background:** Attention deficit hyperactivity disorder (ADHD) is the most pervasive disorder of childhood affecting about 3% to 5%. Early identification and intervention of this problem are very important to address issues at early age. **Materials and method:** Quantitative approach and quasi experimental non equivalent control group pretest-posttest design was used. Total 100 primary school teachers (54 in experimental group and 46 in comparison group) were recruited by convenience sampling technique. Tools in the study were selected variables, structured knowledge questionnaire and structured attitude scale. **Results:** Mean post-test knowledge score (t= 5.24, p=0.00) and mean posttest attitude score (t=4.10, p=0.00) was higher than mean pretest knowledge and attitude score in experimental group. There was a weak positive correlation (r=0.282) in experimental and a moderate positive correlation (r=0.406) in comparison group. There was no significant association of knowledge except gender (p=0.03) and teaching experience (p=0.04) in experimental group and except religion (p=0.03) in comparison group. There was no significant association of attitude in experimental group and except age (p=0.03) in comparison group. Regression shows teaching experience having predictability, R= 30.10% (0.301) on knowledge and qualification having predictability on attitude, R= 34.20% (0.342) in experimental group. In comparison group, number of children having predictability, R= 32.70% (0.327) on attitude. It was concluded that Video based teaching was effective to improve the knowledge and attitude regarding ADHD of children.

***Key words:*** *Video based teaching, Knowledge, Attitude, Primary school teachers, ADHD, children*

## Introduction

Attention deficit hyperactivity disorder (ADHD) is reportedly the most pervasive disorder of childhood affecting approximately 3% to 5% of school-aged children and its prevalence rate increasing significantly over the past two decades[1]

According to American Psychiatric Association, ADHD is defined as "the disorder, characterized by a persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequently displayed and more severe than is typically seen in individuals at a comparable level of development."[2] ADHD is usually first diagnosed in childhood and many children who diagnosed with ADHD demonstrate symptoms that persist later into adolescence and adulthood.[1]

**Teachers have a main impact on children's health. Currently, the need of ADHD children in India is not being met in schools. These children could function very well in a regular school and learn valuable social skills from his peers.**[3]

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If the special needs of these children are not met, it will result in poor academic performance and related psycho-social problems. Thus, early identification and intervention of these problems are very important. **Teachers must be trained to identify the symptoms of ADHD and learning disabilities in schools, so that issues can be addressed at early age.**[4]

Studies show that interventional programs have a role in an increasing knowledge of teachers regarding ADHD, improving awareness and understanding for this disorder which lead to better performance of these children in the classroom..[5]

## Methodology

The study was conducted during the period from March 2017 to July 2018 in the state of Haryana, India. A sample of 100 primary school teachers participated in this quasi-experimental study with the prior permission from District Education Officer. The ***ethical clearance*** was obtained from university research ethics committee of Maharishi Markandeshwar Deemed to be University Mullana, Ambala (MMDU/IEC/975) and the study was carried out in accordance with the guidelines laid by Indian Council for Medical Research ICMR (2006). The written consent from primary school teachers was collected prior to the study. Quantitative research approach with quasi-experimental non equivalent control group pretest post test design was used in this study. Primary school teachers who were working in selected Govt. primary schools of Ambala District, willing to participate in the study, able to read, write and understand Hindi were included for experimental group with the same criteria was included for comparison group. Primary school teachers who were working on part time basis and not available at the time of data collection were excluded. One Hundred participants were enrolled for the study. Out of which 54 primary school teachers were enrolled as experimental group with convenience sampling technique and 46 primary school teachers were enrolled as comparison group with convenience sampling technique. Data was collected by using structured knowledge Questionnaire and structured attitude Scale.

### Description of Tool

1. ***Selected variables:*** Age, gender, qualification, marital status, number of children, religion, teaching experience, exposure to children with ADHD and source of information.

2. ***Structured knowledge questionnaire:*** Structured knowledge questionnaire consisted of 25 items related to knowledge, which were collected from participants with self report (Paper and pencil) technique. The calculated KR20 internal consistency was 0.87

3. ***Structured attitude scale:*** Structured attitude scale (5- point Likert scale) consisted of 23 items on attitude, which were collected from participants with self report (Paper and pencil) technique. The calculated Cronbach's alpha internal consistency was 0.84

### Procedure

The permission was taken to conduct the study in the Government primary schools from District Education Officer of Ambala District, Haryana. Final study was conducted in the month of October 2017- November 2017. Hundred teachers were selected using convenience sampling technique. Conveniently 26 schools were selected that is 10 schools for experimental group and 16 schools for comparison group and then the sample was chosen by convenience sampling technique. The subjects were informed regarding the objectives of the study and written consent was obtained. In experimental group, pre test was taken on day 1 between 9 am to 2 pm by administering the tool (selected variables, structured knowledge questionnaire and attitude scale). Maximum 2 schools were covered per day. Video of 30 minutes duration was shown on same day after pretest in a group of minimum 3 to maximum 10 primary school teachers with the help of laptop. Post test was taken on day 15. In comparison group, pre test was taken on day 1 between 9 am to 2 pm by administering the tool (selected variables, structured knowledge questionnaire and attitude scale). Maximum 4 schools were covered per day. No intervention was given to comparison group. Post test was taken on day 15. The data was collected and analyzed as per the plan of analysis by using SPSS version 20.

## Results

Mean post-test knowledge score (t= 5.24, p=0.00) and mean posttest attitude score (t=4.10, p=0.00) was

higher than mean pretest knowledge and attitude score in experimental group. There was a weak positive correlation (r=0.282) in experimental and a moderate positive correlation (r=0.406) in comparison group. There was no significant association of knowledge except gender (p=0.03) and teaching experience (p=0.04) in experimental group and except religion (p=0.03) in comparison group. There was no significant association of attitude in experimental group and except age (p=0.03) in comparison group. Regression shows teaching experience having predictability, R= 30.10% (0.301) on knowledge and qualification having predictability on attitude, R= 34.20% (0.342) in experimental group. In comparison group, number of children having predictability, R= 32.70% (0.327) on attitude.

Before administration of video based teaching, In experimental group, more than half of the teachers (55.6%) were having poor knowledge, less than half of the teachers (40.7%) were having average knowledge and least number of the teachers (3.7%) were having poor knowledge whereas in comparison group less than half of the (43.5%) teachers were having average knowledge, approximately One third of the teachers(34.8) were having poor knowledge, One fifth of the teachers (19.6%) were having good and least number of the teachers(2.2%) were having very poor knowledge.

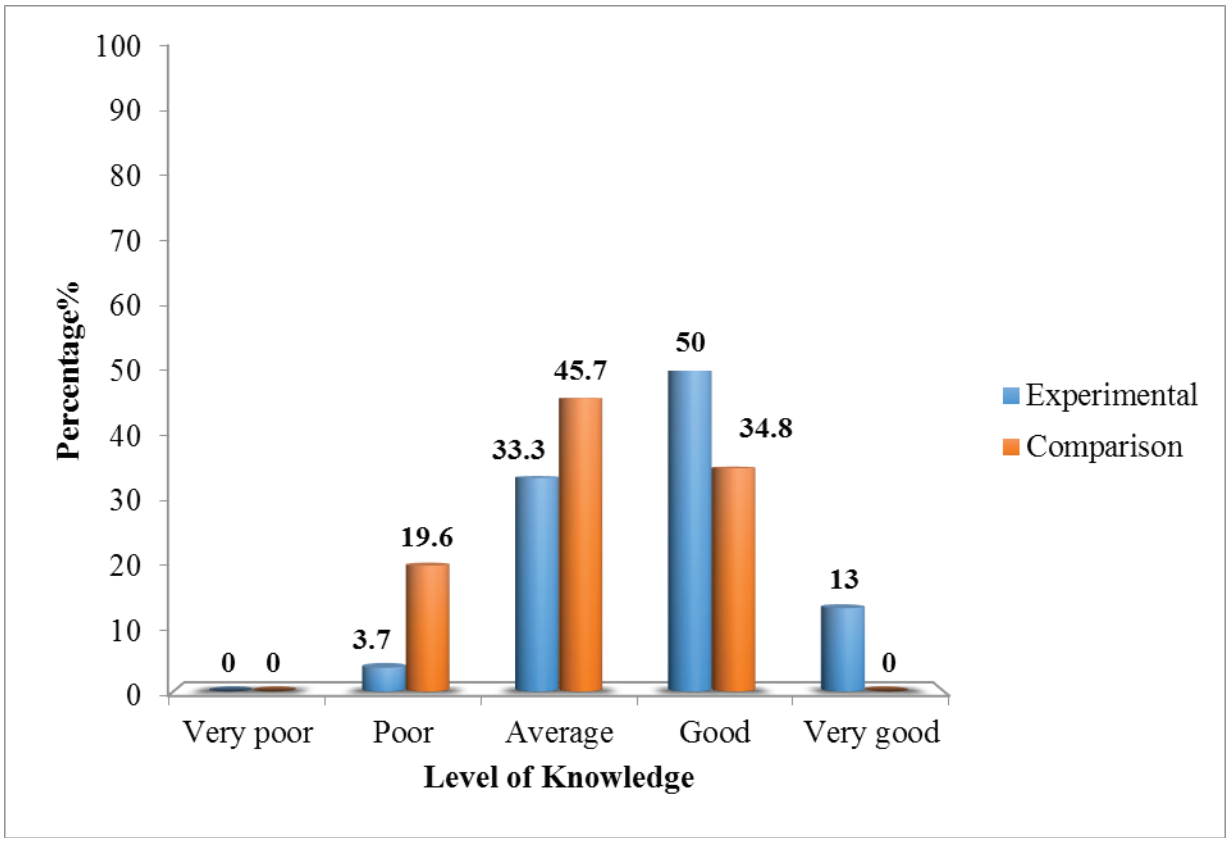


**FIGURE 1- LEVEL OF KNOWLEDGE AFTER ADMINISTRATION OF VIDEO BASED TEACHING**

After administration of video based teaching, In experimental group, half of the teachers (50%) were having good knowledge, one third of the teachers (33.3%) were having average knowledge, one third of the teachers (34.8) were having good knowledge, less than one third of the teachers (13%) were having very good knowledge and none of the teachers were having very poor knowledge. Whereas in comparison group less than half of the (45.7%) teachers were having average knowledge, one third of the teachers (34.8%) were having good knowledge, least number of the teachers (19.6%) were having poor knowledge and none of the teachers were having very good knowledge.

**Table 1: Mean, Mean difference, Standard deviations of difference, Standard error of mean difference and 't' value of Knowledge and Attitude among Primary school Teachers**

**N=100**

| Variable | Group | Mean± SD | MD | SEMD | 't' value | df | p value |
|---|---|---|---|---|---|---|---|
| Knowledge (pre-test) | Experimental (n=54)<br>Comparison (n=46) | 19.59±5.48<br>24.26±6.54 | 4.66 | 1.20 | 3.88 | 98 | 0.00* |
| Attitude (pre-test) | Experimental (n=54)<br>Comparison (n=46) | 150.63±13.26<br>167.70±13.67 | 17.06 | 2.70 | 6.32 | 98 | 0.00* |
| Knowledge (post-test) | Experimental (n=54)<br>Comparison (n=46) | 33.26±6.57<br>26.46±6.29 | 6.80 | 1.29 | 5.24 | 98 | 0.00* |
| Attitude (post-test) | Experimental (n=54)<br>Comparison (n=46) | 172.06±13.40<br>162.15±10.15 | 9.90 | 2.41 | 4.10 | 98 | 0.00* |

t(98)=1.90 *- significant (p≤0.05)

the calculated 't' value of knowledge (5.24) was more than table value i.e. 1.90 at df(98) which indicated that there was a significant difference in the mean score of knowledge between experimental and comparison group. The calculated 't value of attitude (4.10) was more than table value i.e. 1.90 at df(98) which indicate that there was a significant difference in the mean score of attitude between experimental and comparison group which inferred that difference in the mean score was of a true difference and not by chance that post-test knowledge and attitude score of experimental group was significantly higher than post-test knowledge and attitude score of comparison group.

**Table 2: Correlation between Knowledge and Attitude among Primary school teachers N=100**

| Correlation (Post test) | Group | Knowledge r (p value) | Attitude r (p value) |
|---|---|---|---|
| Knowledge | Experimental (n=54) | xx | 0.28 (0.039)* |
| Attitude | Comparison (n=46) | 0.40 (0.005)** | xx |

*- mild correlation (weak correlation) *- significant (p≤0.05)

**- moderate correlation **- highly significant (p≤0.01)

r(52)=0.202 r(44)=0.241

There was a weak positive correlation (r=0.282, p=0.039) between knowledge and attitude in experimental group and there was a moderate positive correlation (r=0.406, p=0.005) between knowledge and attitude in comparison group.

**Table 3: Post hoc value showing significant Mean difference in association of Knowledge regarding ADHD of children among Primary school teachers with Selected Variables**

**N=100**

| | | **Category** | **Mean difference** | **Standard error** | **P value** |
|---|---|---|---|---|---|
| Group Experimental group (knowledge) | Variables Teaching experience (in years) | <5 vs 6-10 | -4.385 | 2.447 | 0.79NS |
| | | <5 vs 11-15 | -7.231 | 2.447 | 0.005* |
| | | <5 vs more than 15 | -3.882 | 2.364 | 0.107 NS |
| | | 6-10 vs 11-15 | -2.846 | 2.447 | 0.250 NS |
| | | 6-10 vs more than 15 | 0.503 | 2.364 | 0.832 NS |
| | | 11-15 vs more than 15 | 3.349 | 2.364 | 0.163 NS |
| Comparison group (attitude) | Age (in years) | 21-30 vs 31-40<br>21-30 vs >40<br>31-40 vs >40 | 5.042<br>2.772<br>7.814 | 5.898<br>5.984<br>2.958 | 0.671NS<br>0.889NS<br>0.030* |

In experimental group, the calculated ANOVA and 't' test value between knowledge score and selected variables was found to be statistically non significant except total teaching experience (F=3.95, p= 0.04). Post hoc shows that as teaching experience was significantly associated with knowledge, category <5 vs 11-15 was having significant high mean difference (p=0.005).

In comparison group, the calculated ANOVA and 't' test value between attitude score and selected variables was found to be statistically non significant except age (F=3.52, p=0.03) Post hoc shows that as age was significantly associated with attitude, category 31-40 vs >40 was having significant high mean difference (p=0.030).

Multiple regression analysis was performed to predict the effect of multiple independent variables( selected variables) over the dependent variable i.e., knowledge and attitude among experimental and comparison groups

**Table 4: Stepwise regression showing Predictability of Multiple Independent Variables on Knowledge and attitude among Experimental and comparison group (Multiple correlation coefficient)**

**N=100**

| Group | Model | R value | R square | F | df | P value |
|---|---|---|---|---|---|---|
| Experimental (knowledge) | Pre test<br><5 years of teaching experience | 0.301 | 0.090 | 5.169 | 1/52 | 0.027* |
| Experimental (attitude) | Elementary teacher training | 0.342 | 0.117 | 6.873 | 1/52 | 0.011* |
| Comparison (attitude) | No. Of children- two children | 0.327 | 0.107 | 5.275 | 1/44 | 0.026* |
| Experimental (knowledge) | Post test<br>11-15 years teaching experience | 0.335 | 0.112 | 6.574 | 1/52 | 0.013* |
| Comparison (attitude) | Age<br>Age &<br>Hindu religion | 0.383<br>0.480 | 0.147<br>0.231 | 7.554<br>6.442 | 1/44<br>1/43 | 0.009*<br>0.004* |

*- significant (p≤0.05)

**Table 5: Stepwise regression showing Predictability of Individual Independent Variable on Knowledge and attitude among Experimental and comparison group (Regression coefficient)**

**N= 100**

| Group | Model | Unstandardized Coefficients | | Standardized Coefficients | t | p value |
|---|---|---|---|---|---|---|
| | | B | SE | B | | |
| Experimental (knowledge) Pretest | (Constant)<br><5 years of teaching experience | 20.512<br>-3.820 | 0.824<br>1.680 | -0.301 | 24.881<br>-2.273 | 0.000*<br>0.027* |
| Experimental (attitude) Pretest | (Constant)<br>Elementary teacher training | 154.212<br>-9.212 | 2.191<br>3.514 | -0.342 | 70.376<br>-2.622 | 0.000*<br>0.011* |
| Comparison (attitude) Pretest | (Constant)<br>No. Of children- two children | 168.356<br>-30.356 | 1.949<br>13.216 | -0.327 | 86.397<br>-2.297 | 0.000*<br>0.026* |
| Experimental (knowledge) Post test | (Constant)<br>11-15 years teaching experience | 34.488<br>-5.103 | 0.977<br>1.990 | -0.335 | 35.315<br>-2.564 | 0.000*<br>0.013* |
| Comparison (attitude) Post test | (Constant)<br>Age<br>(Constant)<br>Age &<br>Hindu religion | 180.610<br>-0.454<br>192.122<br>-0.503<br>-10.440 | 6.860<br>0.165<br>8.464<br>0.160<br>4.818 | 0.383<br>-0.424<br>-0.293 | 26.327<br>-2.748<br>22.700<br>-3.137<br>-2.167 | 0.000*<br>0.009*<br>0.000*<br>0.003*<br>0.036* |

*Significant (p≤ 0.05)

In pretest, the teacher those who are having <5 years of teaching experience (reference group- >15 years teaching experience) having prediction with variability of 9% ($R^2$=0.090) in knowledge among experimental group. The teacher those who are having qualification of elementary teacher training (reference group- other qualification) having prediction with variability of 11.70% ($R^2$=0.117) in attitude among experimental group. The teacher those who are having two children (reference group- more than two children) had prediction with variability of 10.7% ($R^2$=0.107) in knowledge among comparison group.

In post test, the teacher those who are having 11-15 years of teaching experience (reference group >15 years teaching experience) having prediction with variability of 11.20% ($R^2$=0.112) in knowledge among experimental group. Age having prediction with variability of 14.70% ($R^2$=0.147). Further if age combines with Hindu religion (reference group- Muslim religion), both variables together having prediction with variability of 23.10% ($R^2$=0.147) in attitude among comparison group.

## Discussion

In present study, half of the primary school teachers (50%) belong to age group of less than 40 years. These findings are consistent with the study conducted by Shobha Masih, Rajesh K and Atul Kumar (2014)[6] where they found that half of the primary school teachers (50%) belong to age group of less than 40 years.

In present study, pretest mean knowledge score (19.59) was lower than posttest mean knowledge score (33.26), p=0.00. These findings were consistent with the findings of Maloti DK (2006)[7] where it was found that pretest knowledge mean score (27.32) was lower than posttest mean knowledge score (34.76, p<0.00).

In present study, pretest mean attitude score (150.63) was lower than posttest mean attitude score (172.06), t=10.299 with p=0.00) These findings were consistent with the findings of various studies i.e., study conducted by Gopi D, S Deepa (2016)[8] where they found that pretest attitude mean score (27.72) was lower than posttest mean attitude score (46.95, t=21.92 with p<0.001).

In present study, there was a significant weak positive correlation between post knowledge and attitude score in experimental group and a significant moderate positive correlation between post knowledge and attitude score in comparison group (r0.282, p=0.039). These findings were consistent with the findings of Patil P (2013)[9] where it was found that there was significant positive correlation between knowledge and attitude of primary school teachers (r=0.27, p=0.003) at 0.05 level of significance.

In the present study, there was significant association of age with attitude regarding ADHD of children among primary school teachers (F=3.527, p=0.038) was significant associated with attitude. These findings were consistent with the findings of Naregal P (2015)[10] where it was found that age ($\chi^2$=14.769, p<0.05) was having significant association with attitude.

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# Illegalities and Infirmities in Implementation of 'Ex-Servicemen Contributory Health Scheme: Public Audit Findings and Other Irregularities - An Analytical Study

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## Abstract

The objective of the study is to find out the deficits in the Ex-servicemen Contributory Health Scheme (ECHS) that was introduced in 2003 by the Government of India as a panacea for all health needs of veterans' fraternity. The study also analyses these deficiencies and submit certain tangible recommendations with a view to improvise the existing health scheme which should enhance the satisfaction level of the ECHS beneficiaries availing the medical facility. The article critically examines various flaws and shortcomings in the implementation of contributory health scheme meant for retired armed forces personnel and their family members. Author focusses on the public audit findings on the performance of the healthcare scheme to evaluate the working of the medicare facility available under the health scheme.

***Key words:*** *ECHS, Health Schemes, Ex-servicemen' Health, CAG Audit*

## Introduction

*"To save your world you asked this man to die;*
*Would this man, could he see you now, ask why?"*

Epitaph for an unknown soldier
W.H. Auden, (1907-1973), Critic & Poet from USA

Till 2002, there was no appropriate healthcare scheme for Retired Armed Forces personnel (referred hereinafter as veterans) and their family members, and they were struggling to manage their medicare after hanging their uniforms. However, certain medical facilities were available under armed forces insurance schemes which were inadequate as compared to Central Government pensioners. For want of quality healthcare, veterans were agitated and even filed Public Interest Litigation (PIL) in the Apex court to claim "full and free medicare to ex- servicemen and their dependents as one of the fundamental rights guaranteed under the Constitution of India".[1] Although veterans failed to obtain free medicare rights, yet during the litigation, a health scheme namely Ex-servicemen Contributory Health Scheme (ECHS) was approved by the Central Government, in April 2003, to provide comprehensive healthcare on the pattern of Central Government Health Scheme (CGHS) to all ex-servicemen and their dependents.[2] The scheme is contributory and compulsory for all ex-servicemen.

**Spread of ECHS:** Ex-servicemen are mostly spread in villages and small towns all over the country. Presently, 353 districts of the country are covered under the health scheme which is administered with 28 regional centres and 427 ECHS polyclinics [PCs] catering approximately 56 lakhs beneficiaries.[3] Fixed Medical Allowance is granted for the ex-servicemen residing in non-coverage districts. Mobile medical units are also being planned to reach out to far flung and remote areas. 2634 medical facilities have been empanelled to provide treatment and hospitalisation to the beneficiaries. Polyclinic is a primary health centre which functions as Out-Patient Department (OPD)

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for consultation, essential investigation and provision of medicines and also for referral to service hospital/ empanelled hospital for treatment and hospitalization of patients. Every year 55-60 thousand ex-servicemen add to the scheme making it a gigantic healthcare scheme and at the same time, an insurmountable challenge for the scheme's managers to run the show efficiently and satisfactorily.

**Evaluation of ECHS by Public Audit:** After more than 15 years of implementation of the medicare scheme, national auditor i.e. Comptroller and Auditor General of India (CAG), has decided to audit the performance of the health scheme and to examine whether ECHS was able to achieve its aims and objectives. Public audit was particularly concerned with the availability of healthcare infrastructure, patient referral procedure, payment to empanelled hospitals, supply chain of medicines to polyclinics and efficacy of Online-Bill processing system. CAG has found numerous deficiencies in the healthcare system that fails to achieve the desired results of looking after the healthcare of our veterans in their old age.

Public auditors have reviewed ECHS performance for the period of financial years 2012-13 to 2014-15 and has submitted its report to the Parliament on 22 December, 2015 under Article 151 of the Constitution. The audit report[4] is based on the examinations of various activities concerning ECHS at 7 Principle/ Controllers of Defence Account, 10 Regional Centres, 22 Polyclinics, 20 ECHS cells, 15 Service Hospitals and 2 Armed Forces Medical Supply Depots (AFMSD). Such coverage entails inspection of wide spectrum of operational activities of the health scheme so as to arrive at a holistic conclusion.

## Methods and Material

CAG report [ No. 51 of 2015] on ECHS performance is the primary material used in the analysis. Report [No.5] of Departmentally-Related Parliamentary Standing Committee on Defence (2019-20) which examined the budgetary estimates of the health scheme for the year 2020-2021 was also scrutinised. Origin of the ECHS was also traced to search the litigation behind the scheme. Parliamentary debates are also the primary data that show the valuable indicators to facilitate appraisal of the scheme. Government departments' websites were referred for information and data. Annual report (2018-19) of Ministry of Defence has also been studied and utilised.

Descriptive research has been applied to explain and describe 'is' aspects of the health scheme that has facilitated to reach at 'ought to be' factors. Inductive approach has also been utilised to arrive at conclusions. Health scheme has been evaluated and analysed specifically with normative perspective.

## Discussion

**Smart health cards**: Various flaws were found in the ECHS implementation which resulted into financial loss to the exchequer and low-level satisfaction amongst beneficiaries. Against the essence of the health scheme sanction, veterans were charged money for smart-cards without Government's approval while they were required only to pay membership fee of the health scheme at the rate applicable to the rank in which they had retired. Rs. 47.84 crores were collected from the beneficiaries and paid to the vendor, who manufactured 42 lakh smart-cards between January 2004 to February 2015.

ECHS renewed the agreement in May 2010 for five years with the same vendor at the higher cost of Rs.135 per card (initially it was 89.99 per card) without calling tenders. and even market rates were not verified. It burdened the beneficiaries and the health scheme financially. Presently, cost is Rs.177 per smart-card which ECHS beneficiaries have to bear unlike CGHS beneficiaries who are not required to pay for their health-cards. ECHS members have paid twice for cards as the health scheme has undergone technical upgradation for converting initial smart-cards to 64 kb smart cards.

**Multiple and ineligible enrollment:** Use of multiple cards by the same Ex-servicemen (ESM) having different IDs were observed. Smart-card data was found to be defective and unreliable that carries risk of fraudulent payment to hospitals and treatment to unauthorised persons. Internal control mechanism to verify multiple enrollment was lacking. 7431 smart-cards more than the quantity manufactured by the vendor were found extra and in circulation. It posed a risk of misuse and also resulted in extra payment of Rs6.69 lakh to the firm. Many ESM were enrolled more than once under different IDs whereas each ESM was to possess

only one unique ID.

**Excess load on polyclinics:** Medical infrastructure and manpower depend on the authorised capacity of the polyclinic. Many polyclinics were found functioning beyond their authorised capacity which resulted into poor quality of medicare services due to unavailability of medical staff and infrastructure.

**Benefits to ineligible dependent beneficiary.** An expenditure of Rs. 1.92 lakh was incurred on the treatment of ineligible beneficiaries. Sons of ESM on attaining the age of 25 years become ineligible to avail medical facility, but 22 referrals were provided by polyclinic after the beneficiaries had attained the age of 25 years, and 14 beneficiaries had attained the age of 25 years after issue of referral but before commencement of treatment. No mechanism existed (Dec,2015) to re-verify the dependency status of ineligible beneficiaries.

**Expired-medicines:** Life-expired medicines costing Rs. 73.44 lakhs (March 2015) were at AFMSD Delhi Cantt and Polyclinic, Lodhi Road which were required to be returned for replacement to the supplier before three months of expiry dates. This has resulted into wasteful expenditure and poor services to the beneficiaries.

**Excess payment in procurement of oxygen gas:** Receipt and consumption quantity of liquid oxygen found mismatch in the Army Hospital (R & R), Delhi in the records. In the documents maintained, consumption of liquid gas was shown more than what the quantity was received that involved excess payment of Rs. 28.15 lakh to the vendor.

**Diversion of ECHS medical stores:** ECHS medical stores were utilised for treatment of soldiers in military hospitals. Store accounting were not maintained separately to segregate the ECHS stores, which impacts the health services adversely to the entitled ECHS beneficiaries. Army Hospital (R & R), Delhi was found using ECHS medical store in violation of established laid down procedure. Serving personnel seeking treatment in service hospitals are not entitled to avail ECHS medical stores which is primarily meant for ECHS beneficiaries.

**Medical equipments but no technician to operate:** In some polyclinics, X- Ray and Ultrasound machines were authorised but there was no manpower sanction to operate such machines. Interestingly, 22 such machines for 13 polyclinics were procured knowing well that no staff would be available to operate these machines which resulted into avoidable expenditure and idling of machines in clinics. It is saddening to note such apathetic planning to run medical services.

**Shortage and deployment of manpower:** Persistent shortage of staff and medical officers/specialists was observed in polyclinics against authorised strength. ECHS could not fill up sanctioned posts. Recently, manpower level has improved but shortage of medical specialists and dentists still persist. Even, available manpower was deployed and utilised in irregular manner. Polyclinics' manpower was being utilised in ECHS offices against non-entitlement. Manpower from remote PCs were diverted to big cities that had adverse impact on the medicare being provided to veterans in remote areas. Technical manpower was being utilised to perform administrative duties. Lab reports were being signed by technicians at polyclinic, Delhi in violations of medical laws.

**No punitive action against defaulting hospitals:** Certain empanelled hospitals were found indulging in unethical practices like- unnecessary medical procedure, overbilling, medical negligence, refusal for cashless facility and higher charges from the beneficiaries. ECHS did not take punitive actions against the defaulting hospitals in conformity with MoU compromising the delivery of medical services to the beneficiaries.

**Anomalies in hospital bills:** Certain hospitals have raised inflated bills over the authorised package rates which were approved. Rs.1.92 crore was made to empanelled hospitals on this account. 29 empanelled hospitals under the jurisdiction of Chandigarh and Lucknow commands were paid approximately Rs.12 crore extra for not deducting 10%, as per applicable rules, on use of general ward accommodation by the ECHS beneficiaries. Empanalled hospitals in Dehradun, Jabalpur, Lucknow and Varanasi were found charging more room's rent from ECHS comparing to non-ECHS patients. Fortis Hospital has charged higher rates for knee replacement for the ECHS patients in comparison to non-ECHS patients which resulted into excess payment.

**Rebate and discount on medicines:** ECHS Cells at Jabalpur, Gwalior, Pune and Jodhpur failed to deduct 10% discount on Maximum Retail Price (MRP) of chemotherapy medicines supplied to ECHS beneficiaries in violations of applicable guidelines which caused avoidable loss to ECHS. Further, there was no stipulation in the MoA to provide discount on the medicines being supplied by empanelled hospitals and as a result, they were raising bills at MRP while few PCs were procuring medicines at discounted rates.

**Miscellaneous infirmities of the health scheme**

(a) Government had accepted in the Parliament (Nov2016) to have found 1.6 lakh ineligible beneficiaries. who have now been removed from the data. Thus, financial loss on misuse of the health facility cannot be ruled out. However, new cards are supposed to eliminate such problems before health facilities are availed by wily elements.

(b) New smart-cards are taking extremely long time for issuing to the beneficiaries. Many are struggling to get new cards for more than one year. As a result, temporary slips are issued to avail medical services. This is again an area of concern and alarm.

(c) Long queues are seen at certain polyclinics and beneficiaries are to wait for long periods at the clinics firstly for consultation and then for collection of medicines.

(d) Medicines are constantly in short supply, more so, in remote polyclinics. Government is aware about the problems and has stated to be taking remedial measures to improve the supply chains of medicines.[5]

(e) Substantial shortage of budgetary allocation to the health scheme and malpractices by the empanelled hospitals.

(f) Non-renewal of MoAs by the empanelled hospitals owing to deplorable delay in clearing the bills. 407 empanelled hospitals have been stated to have declined renewal of MoAs with ECHS over a period of time.[6]

(g) Manpower contractualisation in administrating the health scheme is the major root cause in its poor implementation and performance.

(h) Government has lodged a FIR against the previous vendor who was engaged in manufacturing smart-cards and has failed to return the data on completion of the contract.[7]

## Conclusion and Suggestion

ECHS has been in the service of veterans' fraternity for more than fifteen years but still, has been facing multitude of problems and has yet to achieve acceptable level of satisfaction amongst beneficiaries. Health scheme is being managed by the armed forces, known for its absolute professionalism and no-lax attitude, as such ECHS needs to perform better on all parameters in delivering of medicare facility not considering CGHS as bench mark. The following suggestions emerge from the analysis of the performance audit and other infirmities for consideration in the improvement of the health scheme.

(a) Technology should be extensively used at every stage and process of ECHS to reduce human intervention in delivering the services. Polyclinics should have emails and mobile numbers of all veterans/beneficiaries for faster communication of relevant information through emails/SMS.

(b) Payment of empanelled hospitals' bills well in time is *sine que non* to run the scheme effectively.

(c) Beneficiaries should be able to take appointment with doctors through a 'specialised app' and or web-based system to avoid crowds in polyclinics and better queue management.

(d) Spare capacity of service hospitals should be readily available on-line to the polyclinics so that beneficiaries can avail service hospital facilities as many polyclinics are co-located in the premises of the service hospitals.

(e) Polyclinics handling more beneficiaries than the authorised capacity be upgraded urgently, and till upgradation of polyclinic is achieved in all respect, manpower from polyclinic having low footfall, should be shifted to big polyclinic. But such manpower must be deployed for managing the health services in polyclinics.

(f) ECHS should be managed with regular manpower like CGHS on whose edifice this health scheme was envisaged. Policy framework for manpower contractulisation to manage such a huge health scheme is conceptually flawed. Reasons for engaging staff on contract are indefensible as staff requirement is of perennial nature. Contractual staff, being vulnerable in many aspects due to their service conditions, cannot be expected to provide first-rate medicare.

(g) Salary of medical specialists/ paramedical staff must be fixed considering the market trends to fill up the vacant posts. Polyclinics should be empowered to engage local doctors on the hourly-basis till medical specialists/dental specialists are recruited as polyclinics are expected to be well acquainted with local market.

(h) Super Specialist Hospital exclusively for veterans' fraternity should be established in few states depending on the ESM numbers. It would reduce the complete dependency on the private hospitals and in due course of time, would be 'special medicare centers' for veterans in the country.

(i) Full budgetary support would be essential as the health scheme is fully financed by the Government. Bills of empanelled hospitals for an amount of Rs.1900 crore are still pending as on February, 2020.

(j) Shortage of medicines at all polyclinics should be managed by appointing local pharmacists on the pattern of CGHS and till local pharmacists are appointed, beneficiaries should be reimbursed the cost of medicines purchased from the market.

(k) Preventive health check of beneficiaries of 50 years and above, should be carried out yearly to detect medical ailments well in time. Health Melas/ lectures by medical specialists on preventive healthcare should be organised in polyclinics and service hospitals.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** was taken from Amity Institute of Advanced Legal Studies, Amity University, Noida (UP)

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# Attitude of Dental Faculty on Admissions to Dental Colleges through National Eligibility cum Entrance Test (NEET) - A Knowledge, Aptitude and Perspective Survey

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## Abstract

There are different admission tests around the world exclusively for admission to dental schools. NEET- National Eligibility cum Entrance Test (NEET) is a multiple choice entrance exam in India for medical, dental as well as paramedical courses, including nursing, physical therapy, pharmacy, and occupational therapy. There is no exclusive test only for dental admissions. There is no scientific literature on NEET and its effects on students, parents as well as the teaching faculty. Though there are a lot of news articles and blogs about it. There is no evidence on how the staff of dental fraternity perceived this change in admissions of students to dental colleges. There has been significant controversy around this change in the admission process. The aim of this survey is to understand the perspective of the dental teaching faculty about NEET, the admission procedure, the difference in the quality of students and the type of the questions in the exam.

***Key Words:*** *NEET, Dexterity Tests, Dental Admission Test, Dental Admissions*

## Introduction

There are different admission tests around the world exclusively for admission to dental schools. Admission committees for dental schools around the world have assessed the correlation between admission requirements and students' subsequent performance in order to decide what factors to use for predicting students' success.

In Korea, the Dental Education Eligibility Test (DEET) was developed to establish the criteria that would be applied to all dental applicants to determine which applicants have the necessary cognitive abilities to successfully complete dental education programs. Dental Admission Test (DAT) is a multiple-choice standardized exam taken by potential dental school students in the United States and Canada.[1] It is designed to provide dental education programs with a means to assess program applicant's' potential for success. The DAT consists of four tests based on: Survey of the Natural Sciences, Perceptual Ability, Reading Comprehension, and Quantitative Reasoning.[2]

Similarly, NEET- National Eligibility cum Entrance Test (NEET) is a multiple choice entrance exam in India for medical, dental as well as paramedical courses, including nursing, physical therapy, pharmacy, and occupational therapy. There is no exclusive test only for dental admissions[3]. It was first introduced in 2013 but met with a lot of opposition[4]. It was also considered unconstitutional by the Supreme court[5]. This proposal of a single entrance exam rather than individual exams of each institute was finally approved in 2015[6]. It includes 180 multiple choice questions from the fields of biology, chemistry and physics[7].

There is no scientific literature on NEET and its

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effects on students, parents as well as the teaching faculty. Though there are a lot of news articles and blogs about it. There is no evidence on how the staff of dental fraternity perceived this change in admissions of students to dental colleges. There has been significant controversy around this change in the admission process. The aim of this survey is to understand the perspective of the dental teaching faculty about NEET, the admission procedure, the difference in the quality of students and the type of the questions in the exam.

## Materials and Methodology

A request to conduct this study was submitted to the Institutional Review Board of the Saveetha University. A survey with a mixed-methods research approach (using both quantitative and qualitative data collection) was formulated consisting of 16 questions to measure the study constructs namely the perspective of dental faculty on the content of NEET, additional tests along with NEET, its effect on students' performance and its effect on school life.

The initial questions were analyzed for content validity by the guide to ensure that the questions gauged the study constructs. The questions were then pilot tested with five faculty members who were given a chance to provide feedback on the clarity of questions and overall format. Alterations were accordingly made and final survey was created on the google forms (online). It was distributed to dental teaching faculty via email, whatsapp and other electronic media. A second follow-up e-mail was sent and telephone calls were made to those who had still not replied. All participants were assured at the beginning of the study that data collected would be kept confidential.

The faculty perception questionnaire consisted of two parts. Part A comprised of the demographic data regarding the personal and professional information of the respondents while Part B consisted of 15 questions with three response options (yes, no and may be) and one open ended question for the qualitative aspect of the survey. The open-ended question underwent thematic analysis that used a staged approach[5,8,9]. The responses were first exported to a Microsoft Excel program, potential themes were identified and the responses were categorized.

## Results

Out of 120 participants, 106 faculty members responded (88% response rate). Out of 106, only 39 replied for the open ended question (36.7% response rate) while the response rate was 100% for the remaining 15 questions. There was almost equal participation of male and female faculty members in the survey. The most common age group was 31- 40 years, maximum respondents were on the lecturer post (Fig 1) and the maximum participation was from deemed colleges (Fig 2).

The first study construct comprised of statements related to the type of questions involved in the NEET and a majority of participants responded yes to include questions related perceptual ability, quantitative reasoning and reading comprehension in the NEET syllabus. 40.6% respondents felt that NEET alone should not be the deciding criteria for dental admissions and 46.2 % felt newer additional evaluation criteria should be devised (Table 1) . The open-ended question asked faculty members about various different evaluation methods for dental admission process. There were only 39 responses to the question. The responses were reviewed to identify themes. Three themes emerged: 1) personal interviews, 2) non-cognitive factors and 3) marks of board exams. The responses were categorized into one of the 3 themes.

The second study construct considered the the effect of NEET on the graduation outcome of the batch. 45.3% respondents replied that they did observe difference in the academic performance of the NEET and NON-NEET batch while only 32.1% felt that there was overall difference between the two (Fig 3 and 4).

The third study construct analysed the effect of NEET on the school life of students. 57.5% respondents thought due to NEET, the co-curricular activities have reduced in school, 55.7% felt that one exam affects students' school life and 62.3 % felt that NEET has lead to increase in stress levels of the students (Table 2).

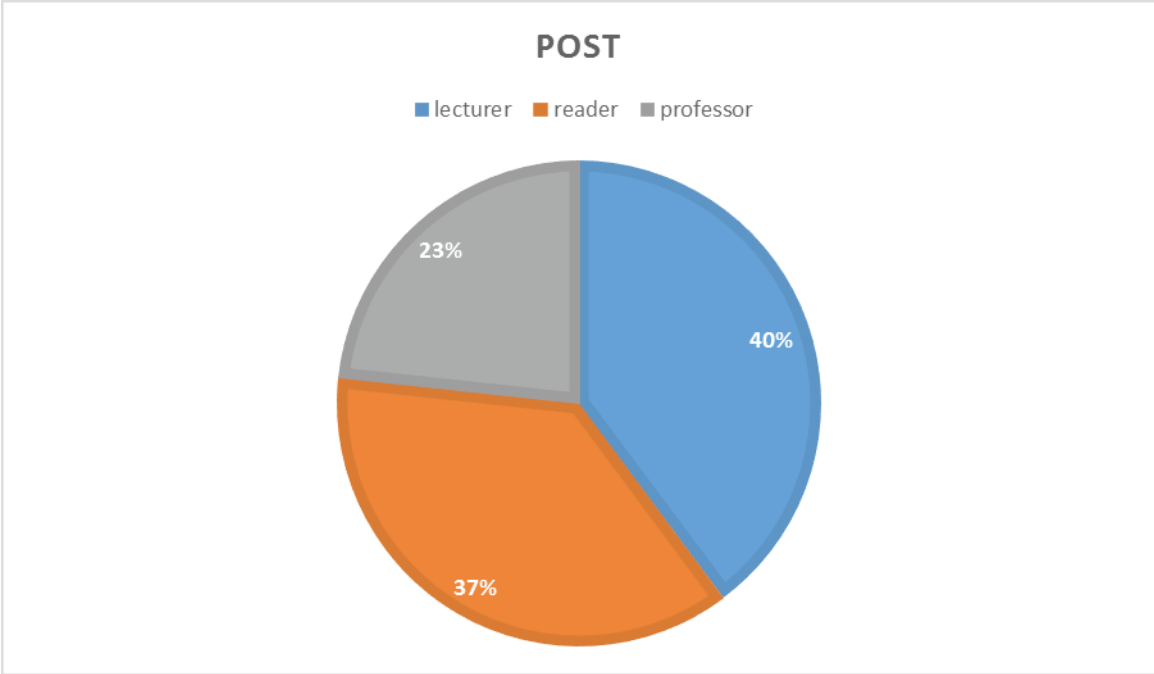


Fig 1: Pie chart showing designation of the faculty in the college.

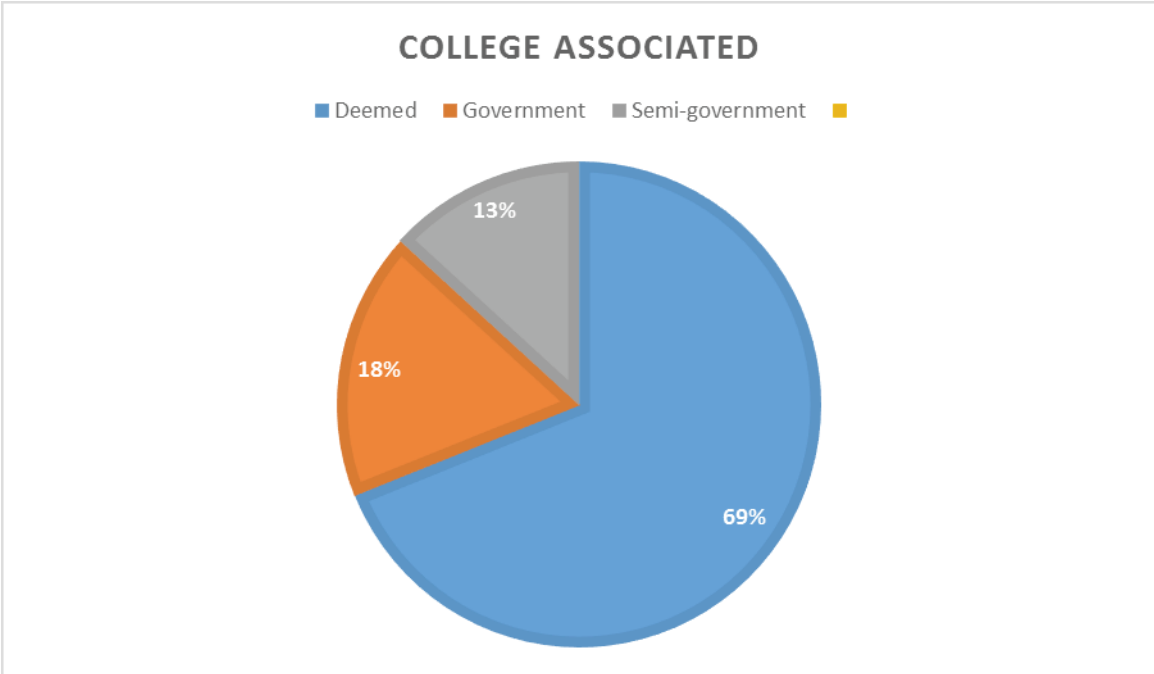


Fig 2: Pie chart showing type of college the respondent is associated with.

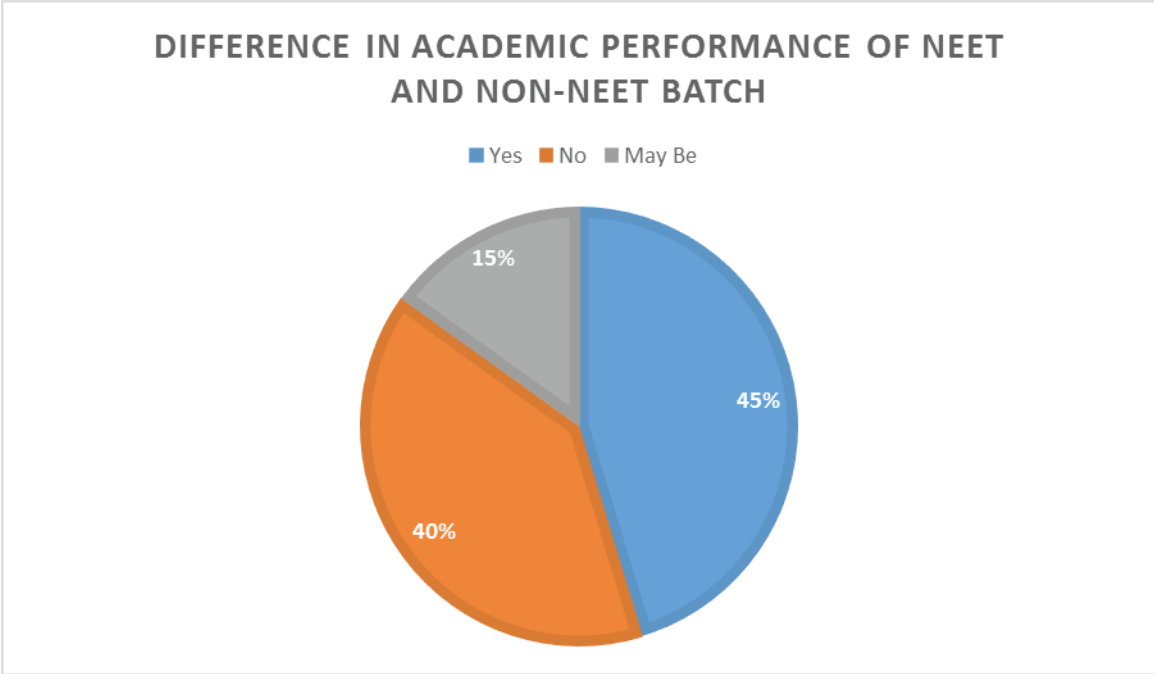


Fig 3: Pie chart showing the faculty view on the difference in the academic performance between two batches

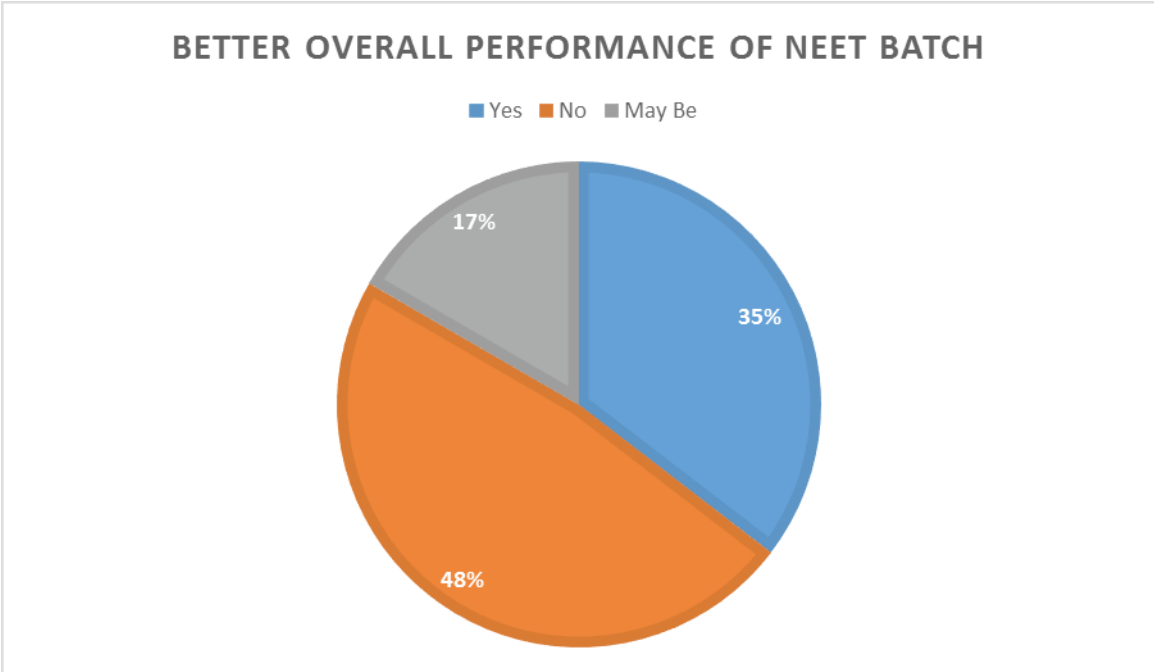


Fig 4: Pie chart showing the faculty view on the difference in the overall performance between two batches.

**Table 1: Questionnaire statements and responses of the first study construct , by percentage of total respondents (N=106)**

| Sr.No. | Questions | YES (%) | NO(%) | MAY BE(%) |
|---|---|---|---|---|
| 1 | Admission to dental school is alright with only NEET marks? | 46.2 | 40.6 | 13.2 |
| 2 | Any other method of evaluation should be considered for admission to dental school? | 46.2 | 30.2 | 23.6 |
| 3 | Have you heard about dexterity tests? | 53.8 | 39.6 | 6.6 |
| 4 | Dexterity evaluation should be included for admission to dental schools? | 46.2 | 15.1 | 38.7 |
| 5 | aptitude testing should be a part of admission to dental schools? | 75.5 | 12.3 | 12.3 |
| 6 | NEET should also include questions related to perceptual ability? | 67.6 | 14.3 | 18.1 |
| 7 | NEET should also include questions related to quantitative reasoning? | 67.9 | 11.3 | 20.8 |
| 8 | NEET should also include questions related to reading comprehension? | 59.4 | 25.5 | 15.1 |

**Table 2: Questionnaire statements and responses of the third study construct , by percentage of total respondents (N=106)**

| Sr. No. | Questions | YES (%) | NO(%) | MAY BE(%) |
|---|---|---|---|---|
| 1 | Having one exam after 12th for all fields affects students' school life? | 55.7 | 30.2 | 14.2 |
| 2 | NEET reduce the co-curricular activities in school? | 57.5 | 28.3 | 14.2 |
| 3 | Students' stress levels increased after introduction of NEET? | 62.3 | 22.6 | 15.1 |

## Discussion

The field of dental education is contemplated to be a coveted and challenged professional field[10]. Faculty members play an important role in moulding the life of a student and also understand their issues and problems[11]. The present study aimed to get perspective of dental faculty members on the national eligibility cum entrance test (NEET) which since its recent debut has caused a lot of turmoil in the aspiring medical students life. In India, NEET was finally accepted as the single exam for entrance to all the medical and paramedical fields after 12th standard in 2016. It comprises of multiple choice questions based only on the three basic science subjects - biology, physics and chemistry[12]. There is no exclusive entrance test for dental schools like Dental Eligibility and Entrance Test in Korea or Dental Admission Test in USA or Dental Aptitude Test in Canada.

106 faculty members responded to the survey questions related to NEET. A majority of them opiniones for the inclusion of dexterity tests, questions on perceptual ability, reading comprehension and quantitative

reasoning in addition to the current NEET syllabus. They also favoured addition of personal interviews and aptitude tests to be conducted before admission to dental schools. According to their responses, many of the faculty members found the NEET batch to be academically better than the NON-NEET batch. Overall, majority of them thought that NEET lead to increased stress amongst the students.

Manual dexterity is the ability of a person to make coordinated hand and finger movements to grasp and manipulate objects using muscular, skeletal, and neurological functions. It is considered to be a significant predictor of academic performance and clinical competency in dental schools[13]. According to Ranney et al, 2005, it is viewed as screening rather than predictive tool for dental admissions and may be used to set baseline scores below which a candidate would not be given consideration[14]. According to another study by Giuliani et al,2007 basic manual dexterity is not essential in the selection of dental students as it was seen that students could learn the skills by hard work during the dental course[15]. For the dental students at the ''Carl Gustav Carus'' School of Dentistry (Technical University of Dresden), it was statistically proven that students could be trained in manual skills within the framework of the pre-clinical training[16].

Questions understanding the students' ability of perceptual thinking, reading comprehension, and quantitative reasoning prepare the students for the further studies. It is important to include these for any admission test for graduate studies[17]. However, according to Kim and Lee et al, 2007, scores from reading comprehension and perceptual ability are not significant predictors of performance in the first year of the dental course, but they are related to the students ease of understanding the subject[18]. Non-cognitive measures like personal interviews and aptitude tests should be considered in the dental admission process as using only cognitive measures is insufficient in properly determining future student performance[19]. In the study by Virtue et al, 2017, the dental faculty members identified noncognitive factors in the terrains of communication, approach to learning, personal characteristics, and professionalism as important skills which contribute to the success of dental students[20].

62.3% dental faculty members who filled the survey felt that NEET lead to increased stress levels amongst the students. Whenever any change is introduced in the exam pattern, it is directly related to the stress levels amongst the students[21]. Since NEET is newly introduced exam, it could be one of the reason for increased stress levels. The stress levels between the current batch and batches to come in future should be compared for understanding the role NEET per se in raising the stress. Many faculty members found that the students who entered the course after appearing for NEET performed better than previous students academically. A study can be done comparing the mean marks of the NEET and the NON-NEET batches to understand the effect of NEET on the academic quality of dental graduates.

There is no scientific evidence available for understanding the limitations, the effects and repercussions of NEET. A lot of studies can be done in this field to evaluate the data with respect to NEET. This survey is just the beginning in this direction by understanding the faculty perspective on NEET.

## Conclusion

The present survey shows that most of the faculty members preferred the addition of dexterity tests, personal interviews, aptitude tests to the exclusive NEET exam for entrance to the dental school. Admission professionals should not totally abandon the cognitive measures

in their assessment of candidates but ought to include the non-cognitive indicators as well. An exclusive admission test only for dental schools would definitely guarantee better quality as well as passionate students in the dental field.

**Conflict of Interest** – Nil

**Source of Funding** - Self

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# Difference in the Academic Performance of NEET and NON-NEET batch- A Cohort Study At Saveetha Dental College

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## Abstract

In India, in 2016, the medical council of India introduced one single common entrance test called NEET- National Eligibility Entrance Test for admission to all the medical and paramedical courses after 12th standard. It allowed dental admission to all the colleges including the government as well as the private. Many developed countries have evolved dental admission tests based on the academic research surveys, student performances and other relevant parameters. Since NEET is the first attempt by the government of India to create a central admission process, it is clearly in its early process and there is an incredible need for scientific data to evolve the system. The aim of this study is to analyze if the admissions through NEET affected the quality of students with respect to their academic performance pursuing the undergraduate dental program, especially in the private colleges.

***Key Words**: NEET, Dental education, Dental school admissions, India, Dental graduates*

## Introduction

Dental education in India laid its foundation in 1920s, when Dr.Rafidin Ahmed started the first dental college in Calcutta.[1] Till the 1960s, all dental colleges were government-aided colleges. In 1966, first private dental college was established in India. Currently, there are 342 dental colleges in the country out of which 302 are privately owned and only 40 are run by the government.[2] The increasing number of dental colleges leads to a substantial increase in the number of dental graduates per year.[3] The number of graduating dental students in 2000 was 26,000 compared to 1,370 in 1960.

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Formerly, an aspiring student could gain admission to a dental college in India via two ways:

1) Government-administered entrance exam or

2) Private school-administered entrance exam

Government entrance exams again were at two levels. One was state level, entrance exams- specific for each state (domicile students of that particular state) and second at all-India level, for which students from all over the country could apply. All the private colleges conducted their specific entrance exams.[4]

Due to this system, the students had to appear for various tests and anticipate the results in different exams. There was no standardized exam at one level. This led to loss of their time, money and energy. In 2013, the medical council of India introduced one single common entrance test called NEET- National Eligibility Entrance Test for admission to all the medical and para-medical courses after 12th standard. It allowed dental admission to all the colleges including the government as well as the private. It suffered a lot of opposition and finally was systematically conducted in 2016.

Many developed countries have evolved dental admission tests based on the academic research surveys, student performances and other relevant parameters. Since NEET is the first attempt by the government of India to create a central admission process, it is clearly in its early process and there is an incredible need for scientific data to evolve the system.

The aim of this study is to analyze if the admissions through NEET affected the quality of students with respect to their academic performance pursuing the undergraduate dental program, especially in the private colleges.

## Materials and Methodology

The study was conducted in Saveetha Dental College and Hospital, Chennai with the ethical approval of the education review board of the institute. Two cohorts of batches were selected for the study, the 2015 batch (NON-NEET) whose admissions were done according to the Saveetha protocols which included a multiple choice exam conducted by the institute along with personal interviews and dexterity tests, while the second cohort was the 2016 batch who acquired admission through NEET, the centralized common entrance test. The academic performance was measured by comparing the Anatomy subject marks acquired by the students in their university exam at the end of first year of their BDS course.

**The two cohorts:**

Group 1- 2015 NON-NEET batch

The total sample for the 2015 batch was 96. They acquired admissions through the Saveetha entrance test, personal interview and the dexterity tests.

Group 2- 2016 NEET batch

The total sample for the 2016 batch was 49. They acquired admissions to the Saveetha Dental College through NEET- National Entrance Eligibility Test.

The datafile consisted of the final exam marks of the Anatomy subject of the two batches. The marks were obtained out of 200.

IBM SPSS software was used for data analysis. The mean was compared between the two years using the independent students t-test. The data was checked for normality of distribution. The analysis consisted of comparison in the academic performance of the two batches.

## Results

The data followed a normal gaussian curve pattern (Fig.1). So the difference in sample size didn't interfere with the results.

There wasn't a significant difference (>0.05) in the academic outcome of 2015 and 2016 batch. The descriptive analysis is given in the table 1.

The mean score of 2015 ie the non NEET batch was 135.08 while that of 2016 ie the NEET batch was 131.78. A graph representing the means of Anatomy marks in 2015 (1) and 2016(2) is shown in Fig.2.

A comparison of marks based on the gender was also done between the two cohorts. The mean anatomy marks of females (0) decreased in 2016, while it increased for males (1). Following graph describes the difference in the marks within the gender (Fig.3).

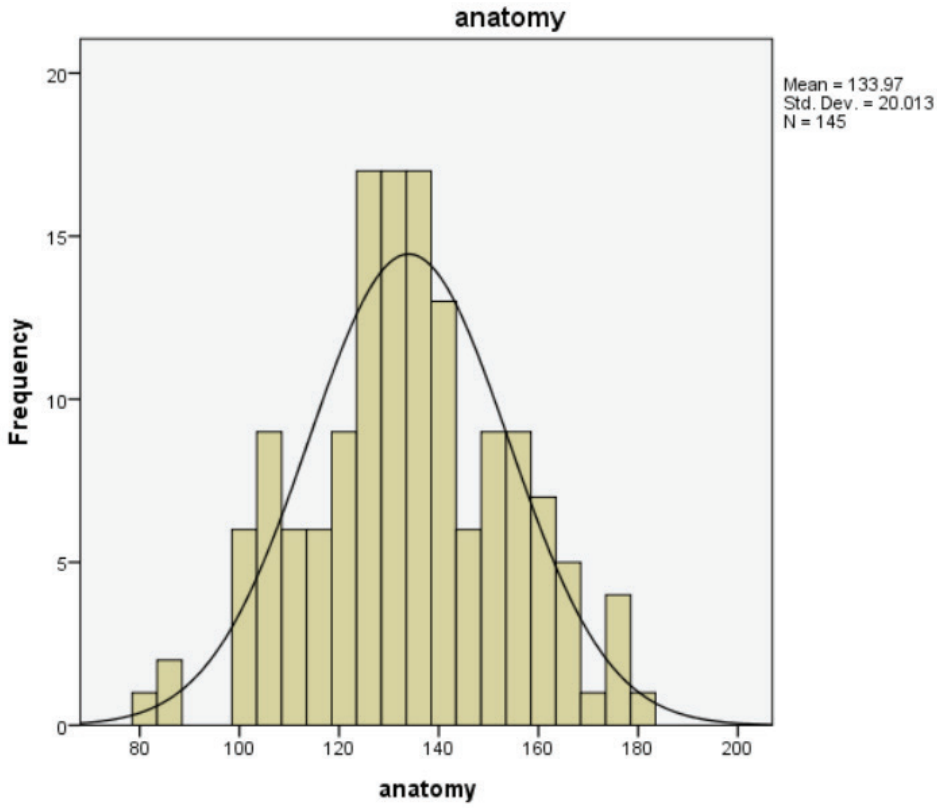


**Fig 1: The normal gaussian curve obtained between the the data of the two cohorts.**

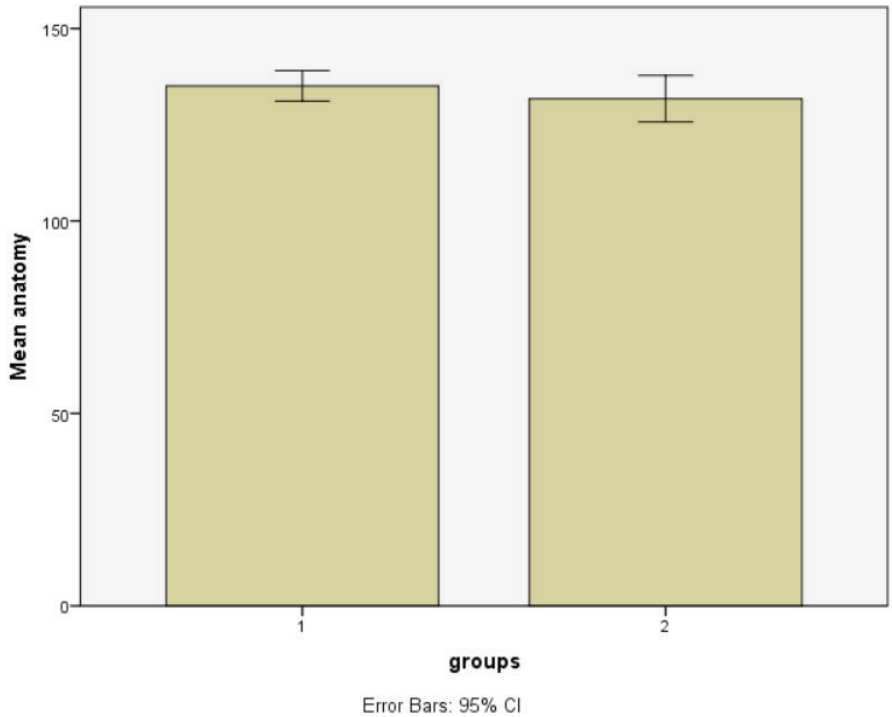


**Fig 2: A bar graph representing the means of anatomy marks in the two cohorts along with standard error bars.**

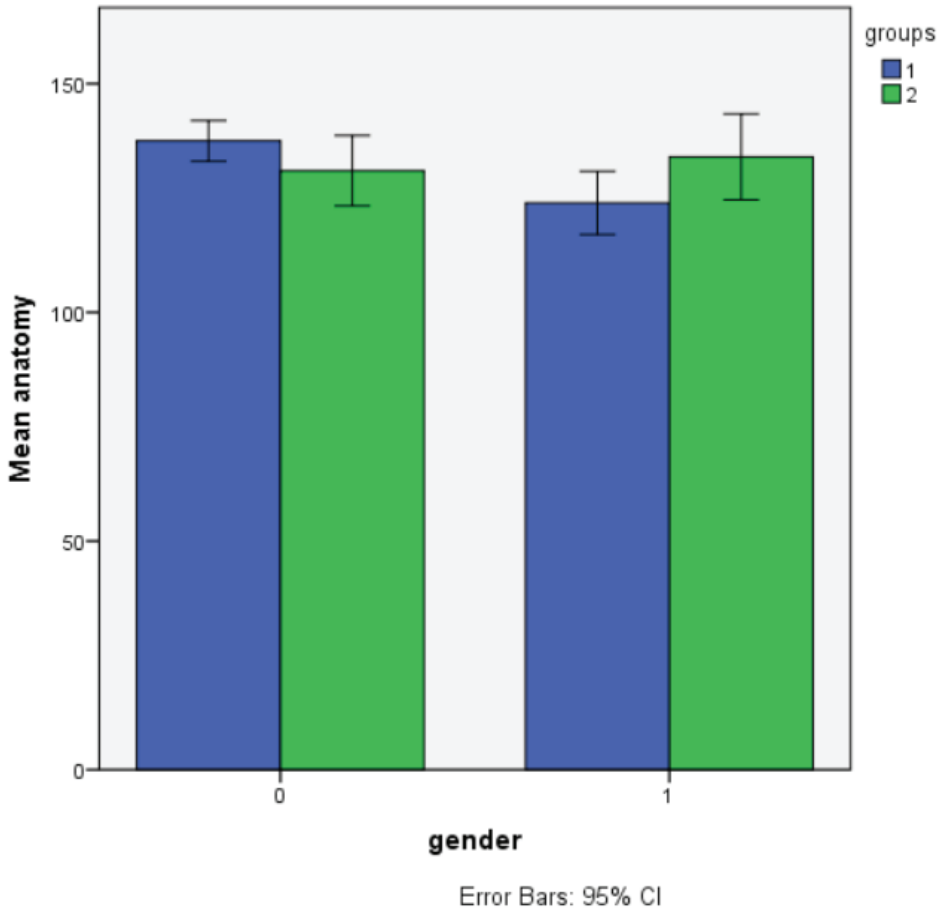


**Fig 3: A bar graph representing the mean scores of females (0) and males (1) between the cohorts, blue (2015 batch) and green (2016 batch)**

**Table 1: It shows the descriptive analysis of the two cohorts with the mean marks obtained by each group.**

**Anatomy**

| groups | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| 1 | 96 | 135.08 | 19.499 | 1.990 |
| 2 | 49 | 131.78 | 21.015 | 3.002 |

## Discussions

From the above study, it is discovered that there is no significant difference in the mean anatomy marks of 2015 (NEET) and 2016 (NON-NEET) batches. Although, there is a significant difference in the academic performances of males and females, with males showing an improvement in the performance while vice versa for the females.

Admissions committees for dental schools around the world have assessed the correlation between admission requirements and students' subsequent performance in order to decide what factors to use for predicting students' success. The Dental Education Eligibility Test (DEET) was developed in Republic of Korea to establish the criteria that would be applied to all dental applicants. The DEET was designed to determine which applicants

have the necessary cognitive abilities to successfully complete dental education programs in Korea. Although the DEET has been shown to have the ability to predict performance in the first semester, its ability to predict tends to decrease as students' progress to the end of the dental course.[13]

Dental Admission Test (DAT) is a multiple-choice standardized exam taken by potential dental school students in the United States and Canada.[5] It is designed to provide dental education programs with a means to assess program applicant's' potential for success. The DAT consists of four tests based on: Survey of the Natural Sciences, Perceptual Ability, Reading Comprehension, and Quantitative Reasoning.[6] It measures the cognitive ability of students and is considered as a predictor of dental school performance but only in the first and second years of dental training in a traditional curriculum.[7] Similarly, NEET is a multiple choice entrance exam in India for medical, dental as well as paramedical courses, including nursing, physical therapy, pharmacy, and occupational therapy. There is no exclusive test only for dental admissions.[2]

There haven't been any studies in India which involve NEET. The present study assessed if the academic performance in the subject of Anatomy, of the first year dental program was affected by the introduction of NEET in turn indicating the difference in the academic quality of students enrolled in the dental school. There can be various other factors affecting the academic performance of the batches. These include the teaching methodology, exam pattern, exam toughness, examiners, the subject per se, the variety in the crowd due to national level exam and many more.

After the introduction of NEET, the total admissions of people from different states increased in colleges. This led to more people from outside state to be the part of institution which in turn increased the number of students staying away from their families. Studies have revealed that staying at a hostel away from family, has a significant effect on the academic performance.[11]This could be because a hostelite may come across various problems that could increase stress levels. Stress generated while staying in hostel is regarded as one of the main factors for under performance of medical students.[12,13] Living at home with family members make a student emotionally more stable and confident. This could possibly be one of the reasons for decreased performance in the NEET group of 2016. The other factors like the condition of the hostel, the culture of people in new area, the surrounding environment can be matched as both the groups belonged to the same institute.

Factors like teaching methodology and exam patterns were matched as there was no drastic change in them between the two years. The toughness of exam was matched for both the years by getting the papers analyzed by 5 examiners who graded the toughness of papers on a scale of 1-5. There was no significant difference in the results. There were different examiners for both the years and that could have created bias in the study.

The difference in the academic performances of males and females could have various factors affecting it. The improvement in the performance of males can be explained by their increased sincerity towards NEET which in turn implies better performance in the first year of BDS. Stress could be regarded as one of the factors affecting the performance of females. In an article by Lu Y et al,2015, wherein the author studied the effect of competitive experience between genders, it was stated that females tend to get more stressed compared to males on experiencing more competitive environment.[11] This could lead to decreased performance in the females under the pressure of NEET.

Anatomy as a subject includes the cognitive as well as the dexterity skills. Knowledge of anatomy is highly relevant to dentistry especially when performing anesthesiological or surgical procedures. The theoretical knowledge of anatomy helps in the clinical skills of the dentist.[12] The academic performance in this subject depends on the students hard-work and understanding of the subject.[13] Since there is no significant difference in the academic performances of both the batches, both the NEET as well as the NON-NEET students appear to be sincere and hardworking. One of the reasons for this could be as the NON-NEET batch in Saveetha was enrolled only after thoroughly clearing the various admission protocols as mentioned before.

The limitation of the study is that it was performed only in one institute and this could lead to bias in the results. An elaborate study needs to be conducted including all the dental institutes comparing the first year

marks of the BDS curriculum between the NEET and NON-NEET batches.

## Conclusion

NEET- National Entrance and Eligibility Test did not significantly affect the academic performance of the 2016 batch compared to the 2015 batch in Saveetha Dental College and Hospitals, Chennai. The academic quality of dental graduates in first year of the BDS course could be considered similar for both the batches 2015 (NEET) and 2016 (NON-NEET).

A better understanding of the effects of NEET on the academic performance of first BDS could be made by conducting this study at multiple dental institutes. This could also help in achieving the comparison of the two batches, especially in private dental institutes where the admissions before the commencement of NEET were taken by respective college protocols. The ultimate test of validity will not be available for some years, until the current cohorts of students graduate.

**Conflict of Interest –** Nil

**Source of Funding -** Self

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# Effect of NEET based Selection Process on the Academic Outcome of Students Pursuing Dentistry - A Cohort Study at Saveetha Dental College

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## Abstract

**Introduction:** In India, in 2016, the medical council of India introduced one single common entrance test called NEET- National Eligibility Entrance Test for admission to all the medical, dental and paramedical courses after 12th standard for government as well as private institutes. Since NEET is the first attempt by the government of India to create a central admission process, it is clearly in its early process and there is an incredible need for scientific data to evolve the system. The aim of this study is to analyze if the admissions through NEET affected the quality of students with respect to their academic performance pursuing the undergraduate dental program, especially in the private colleges.

**Materials and Methodology:** The academic performance was measured by comparing the Dental Anatomy (DA) subject marks acquired by the students in their university exam at the end of first year of their BDS course for the years 2015, 2016 and 2017.

**Results:** There was a significant difference (<0.05) in the academic outcome of the NEET and NON-NEET batches, but there wasn't a significant difference (>0.05) between the two NEET batches i.e. between 2016 and 2017 batches.

**Conclusion:** The academic quality of dental graduates in first year of the BDS course could be considered better considering the marks of dental anatomy subject for both the NEET batches 2016 and 2017 compared to the NON-NEET batch of 2015.

***Key Words:*** *NEET, Dental education, Dental school admissions, India, Dental graduates*

## Introduction

Indian education system in the field of healthcare is one of the largest in the world. Many of its graduated doctors emigrate, and create a global impact.[1] India is the seventh largest and the second most populous country of the world. Oral diseases form a huge part of public health issues in India. Around 60%–65% of the general population are being affected by dental caries.[2] The prevalence, incidence and severity of oral diseases in India lead to the need of an effective dental education methods and oral health care delivery systems.[3]

Dental education in India was formerly established in 1920s, when Dr.Rafidin Ahmed started the first dental college in Calcutta.[4] Till the 1960s, all dental colleges were government-aided colleges. At present, there are 342 dental colleges in the country amongst which 302 are privately owned and only 40 by the government.[5] The increasing number of dental colleges leads to a

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substantial increase in the number of dental graduates per year.[6] The number of graduating dental students in 2000 was 26,000 compared to 1,370 in 1960.

Formerly, an aspiring student could gain admission to a dental college in India via two ways:

1) Government-administered entrance exam or

2) Private school-administered entrance exam

All the private colleges conducted their specific entrance exams.[7] Due to this system, the students had to appear for various tests and anticipate the results in different exams. There was no standardized exam at one level. This led to loss of their time, money and energy.

In 2010, the medical council of India introduced one single common entrance test called NEET- National Eligibility Entrance Test for Admission to all the medical and paramedical courses after 12th standard. It allowed dental admission to all the colleges including the government as well as the private. It suffered a lot of opposition and finally was systematically conducted in 2016. Many developed countries have evolved dental admission tests based on the academic research surveys, student performances and other relevant parameters. Since NEET is the first attempt by the government of India to create a central admission process, it is clearly in its early process and there is an incredible need for scientific data to evolve the system.

The aim of this study is to analyze if the admissions through NEET affected the quality of students with respect to their academic performance pursuing the undergraduate dental program, especially in the private colleges.

## Materials and Methodology

The study was conducted in Saveetha Dental College and Hospital, Chennai with the ethical approval of the education review board of the institute. Three cohorts of batches were selected for the study, the 2015 batch (NON-NEET) whose admissions were done according to the Saveetha protocols which included a multiple choice exam conducted by the institute along with personal interviews and dexterity tests, the second cohort was the 2016 batch who acquired admission through clearing NEET, the centralized common entrance test as well as the personal interviews, while the third cohort was the 2017 batch who acquired admissions solely on the basis of NEET ranking (Table1). The academic performance was measured by comparing the Dental Anatomy (DA) subject marks acquired by the students in their university exam at the end of first year of their BDS course.

The datafile consisted of the final exam marks of the Dental Anatomy subject of the three batches. The marks were obtained out of 200.

IBM SPSS software was used for data analysis. The mean was compared between the three years using the Tukey HSD test. The data was checked for normality of distribution. The analysis consisted of comparison in the academic performance of the three batches.

## Results

The data followed a normal gaussian curve pattern. So the difference in sample size didn't interfere with the results.

There was a significant difference ($<0.05$) in the academic outcome of the NEET and NON-NEET batches, but there wasn't a significant difference ($>0.05$) between the two NEET batches ie between 2016 and 2017 batches (Fig 1).

The mean score of 2015 ie the non NEET batch was 165.36, 2016 ie the NEET batch was 204.69 and that of 2017 was 198.31. A graph representing the means of Dental Anatomy marks in 2015, 2016 and 2017 between both the genders is as follows (Fig 2).

**Table 1: Descriptive data of the three cohorts used in the study**

| Sr.No. | Year | Batch | Sample size | Admission protocol |
|---|---|---|---|---|
| 1 | 2015 | NON-NEET | 96 | Saveetha entrance test, interview, dexterity test |
| 2 | 2016 | NEET | 49 | NEET score and interview |
| 3 | 2017 | NEET | 76 | Only NEET rank |

**Table 2 : It shows Tukey HSD test depicting the comparison of means marks acquired by the three batches.**

| Years(I) | Years(J) | Mean Difference (I-J) | Std.Error | Sig. | 95%Confidence Interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |
| 2015 | 2016 | -24.172 | 3.159 | .000 | -31.63 | -16.72 |
| | 2017 | -22.703 | 2.762 | .000 | -29.22 | -16.18 |
| 2016 | 2015 | 24.172 | 3.159 | .000 | 16.72 | 31.63 |
| | 2017 | 1.469 | 3.296 | .896 | -6.31 | 9.25 |
| 2017 | 2015 | 22.703 | 2.762 | .000 | 16.18 | 29.22 |
| | 2016 | -1.469 | 3.296 | .896 | -9.25 | 6.31 |

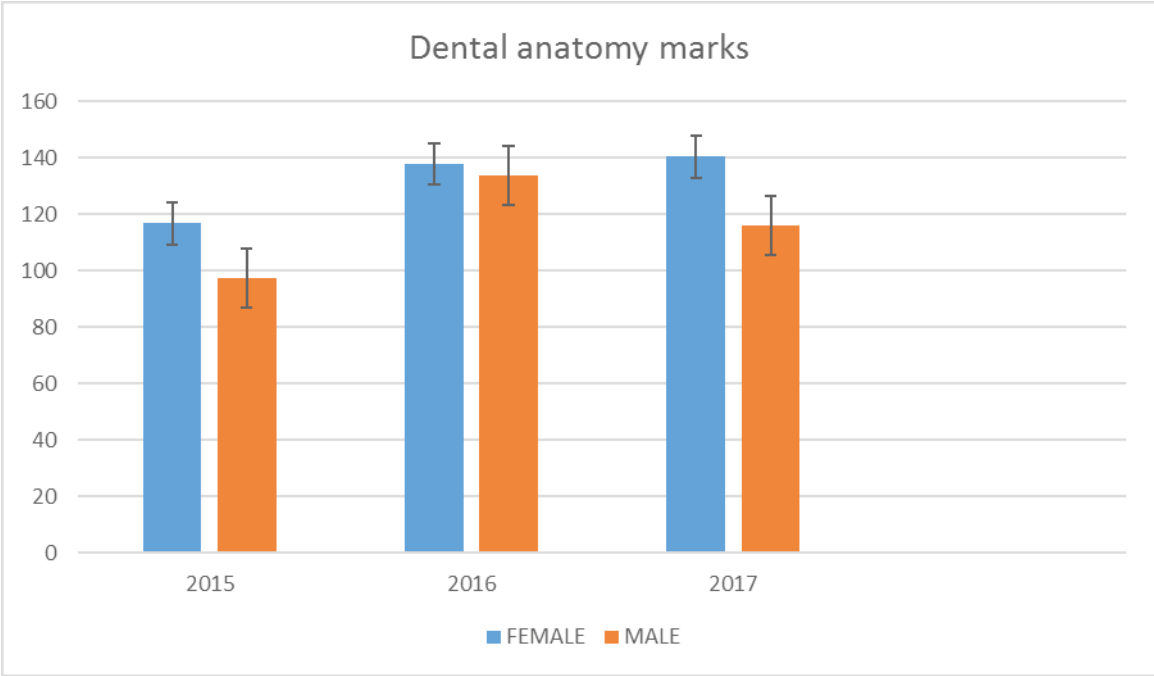


**Fig 1: A bar graph representing the means of dental anatomy marks of the three cohorts between both the genders, male ( dark blue) and female ( light blue) along with standard error bars.**

## Discussions

From the above study, it is discovered that there is a significant difference in the mean dental anatomy marks of 2015 (NON-NEET) and 2016 (NEET) batches and between 2015 (NON-NEET) and 2017 (NEET) batches. There is no significant difference in the mean marks of the two NEET batches although the marks of 2017 batch were comparatively lesser than 2016 batch.

Admissions committees for dental schools around the world have assessed the correlation between admission requirements and students' subsequent performance in order to decide what factors to use for predicting students' success. The Dental Education Eligibility Test (DEET) was developed in Republic of Korea to establish the criteria that would be applied to all dental applicants. The DEET was designed to determine which applicants have the necessary cognitive abilities to successfully complete dental education programs in Korea. Although the DEET has been shown to have the ability to predict performance in the first semester, its ability to predict tends to decrease as students' progress to the end of the dental course.[116]

Dental Admission Test (DAT) is a multiple-choice standardized exam taken by potential dental school students in the United States and Canada.[8] It is designed to provide dental education programs with a means to assess program applicant's' potential for success. The DAT consists of four tests based on: Survey of the Natural Sciences, Perceptual Ability, Reading Comprehension, and Quantitative Reasoning.[9] It measures the cognitive ability of students and is considered as a predictor of dental school performance but only in the first and second years of dental training in a traditional curriculum.[10] Similarly, NEET is a multiple choice entrance exam in India for medical, dental as well as paramedical courses, including nursing, physical therapy, pharmacy, and occupational therapy. There is no exclusive test only for dental admissions.[5]

Dental admission exams are a positive indicator of students' performance in other countries.[11] There haven't been any studies in India which involve NEET. The present study assessed if the academic performance in the subject of Dental Anatomy, of the first year dental program was affected by the introduction of NEET in turn indicating the difference in the academic quality of students enrolled in the dental school. NEET seemed to be a positive indicator. There can be various other factors affecting the academic performance of the batches. These include the teaching methodology, exam pattern, exam toughness, examiners, the subject per se, the variety in the crowd due to national level exam and many more.

Factors like teaching methodology and exam patterns were studied amongst the three years in Saveetha dental college. The toughness of exam was evaluated for the three years by getting the papers analyzed by 5 examiners who graded the toughness of papers on a scale of 1-5. There was significant increase in the toughness of 2017 exam paper. The exam pattern was similar for 2015 and 2016 batches while it changed for 2017 batch. The paper pattern for the two previous batches comprised of 2 long questions, 5 short questions and 30 multiple choice questions while for the year 2017 it was changed to 1 long question, 2 short questions and instead of multiple choice questions, 90 one word questions were added. Answering one word questions would be difficult for the students of the first year who have been preparing for two years for NEET which is multiple choice question based exam. This could be one of the reasons for decreased marks of the 2017 batch.

Dental Anatomy as a subject includes the cognitive as well as the dexterity skills. Learning dental anatomy builds the foundation for a dentist for all the future studies. It is a new subject for the students and does not directly depend on the previous knowledge. The theoretical knowledge of dental anatomy helps in the clinical skills of the dentist. [12]The academic performance in this subject depends on the students' hard-work and understanding of the subject.[13] Since there is a significant difference in the academic performances of the batches between the NEET as well as the NON-NEET, the students acquiring admissions through NEET appear to be more sincere and hardworking.

Factors like the condition of the hostel, the culture of people in new area, the surrounding environment could be matched as all the groups belonged to the same institute and thus had same surroundings.

The limitation of the study is that it was performed only in one institute and this could lead to bias in the results. An elaborate study needs to be conducted

including all the dental institutes comparing the first year marks of the BDS curriculum between the NEET and NON-NEET batches.

## Conclusion

NEET- National Entrance cum Eligibility Test does seem to improve the performance of the students in their first year exams in Saveetha Dental College and Hospitals,Chennai. The academic quality of dental graduates in first year of the BDS course could be considered better considering the marks of dental anatomy subject for both the NEET batches 2016 and 2017 compared to the NON-NEET batch of 2015.

A better understanding of the effects of NEET on the academic performance of first BDS could be made by conducting this study at multiple dental institutes. This could also help in achieving the comparison of the two batches, especially in private dental institutes where the admissions before the commencement of NEET were taken by respective college protocols. The ultimate test of validity will not be available for some years, until the current cohorts of students graduate.

**Conflict of Interest –** Nil

**Source of Funding –** Self

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# Medical Device Prototype for Planter Intrinsic Muscles: A Scientific Note

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## Abstract

**Background**: Intrinsic foot muscles are the contributors in the medial longitudinal arch and weakness of these muscle contributes to range of foot deformities but the level of weakness is still unknown as there is no valid and reliable method available to measure the strength of these muscles. Previous efforts to quantify these muscle strengths were done like toe dynamometry, planter pressure etc. All such instruments made do not consider two major biomechanical consideration 1. Position of Metatarsophalangeal Joint and 2. Position of Ankle joint which is very important for keeping extrinsic foot muscle in disadvantage and no effort was made to isolate the intrinsic muscle during measurement

**Methods**: The present prototype is designed to measure the forces of the planter intrinsic foot muscles for research and clinical purposes All the considerations which was not taking care of in previous design considered in the present design of our prototype.

**Conclusion:** Our device is one stop destination for the assessment and treatment of planter intrinsic muscle where we can measure their strength and also strengthen them on the same platform by various exercises and strengthening and therapeutic devices.

***Key words:*** *Ankle Joint, Metatarsophalangeal joint, Planter intrinsic muscle, Toe dynamometry*

## Introduction

According to Leonardo da Vinci 'The human foot is a masterpiece of engineering and the work of art' the reason he says so is possibly due to the complex nature of the foot with numerous articulations in its credit and its capacity to provide us a static posture as well as do important role in dynamic actions due to its various degree of freedom[1] In the process of evaluation from quadrupedal to bipedal stability component of foot overpower the grasping function with the development of arches [2,3] which require some external static (provide by ligaments and fascia) and dynamic (provide by extrinsic and intrinsic muscles of foot) support to prevent them from collapse

The concept of core stability to the arch of the foot and as there is local stabilizers and global movers in spine this article classifies the intrinsic muscle of foot as local stabilizers and extrinsic muscle of foot as global movers of foot.[1] Weakness of Intrinsic foot muscle can cause foot deformities and disorders [4,5]

For the measurement of the intrinsic muscles strength of the foot there is a need for exact measurements of these muscles in isolation. Earlier researchers had used a various direct method for the quantification of intrinsic foot muscles. Most studies have measured toe flexor force using fixed hand-held dynamometry, [6,7,8] force Plate, or various special test were used like Paper Grip and Intrinsic Positive Test. [9,10,11,12,13,14] The

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different types of toe dynamometry which is used, a toe curling action can occur during toe flexor measurement, which activate the long (extrinsic) toe flexors. Position of ankle is another important consideration overlooked by the previous designs as most of the extrinsic toe flexor become short in plantarflexion of ankle and less likely to influence the movement. [15]

Apart from these direct methods some indirect methods were also used to assess the intrinsic muscle strength like Electromyography (EMG), Computerized tomography ultrasound and magnetic resonance Imaging.[16-18] all these indirect methods can differentiate intrinsic and extrinsic muscle but cannot quantify them. These literatures suggest that there is no valid and reliable method available to quantify the intrinsic muscle of the foot. The main challenges are to limit the role of the extrinsic muscle of the foot and also isolate the intrinsic muscle.

There is a need to design a mechanism which will take care of above discussed biomechanical consideration and also before finalize the design isolate the intrinsic muscle by the help of any of the clinical method so that device can efficiently measure the intrinsic muscle of the foot.

**Materials and Methods:** The present Prototype is a Novel Design which is not inspired by any other medical device designed to measure the intrinsic muscle strength. The device is made up of wooden and iron and the base is covered by the carpet. Quantification of the intrinsic foot muscle is done by the The Saehan Hydraulic Hand Dynamometer[19] device with a slight modification, that was securely kept in an angle on a wooden frame.

**Design**: The design of the instrument is according to the biomechanical consideration which are deficient in previous design before going forward for the design the force analysis of the instrument was done with the help of ANSYS designing software.

The structural analysis was done to validate the instrument and to prove the forces are in the direction which are desirable, to do that first the designing of the instrument was done in CRCO software and the designing of the instrument was done (Fig 1)

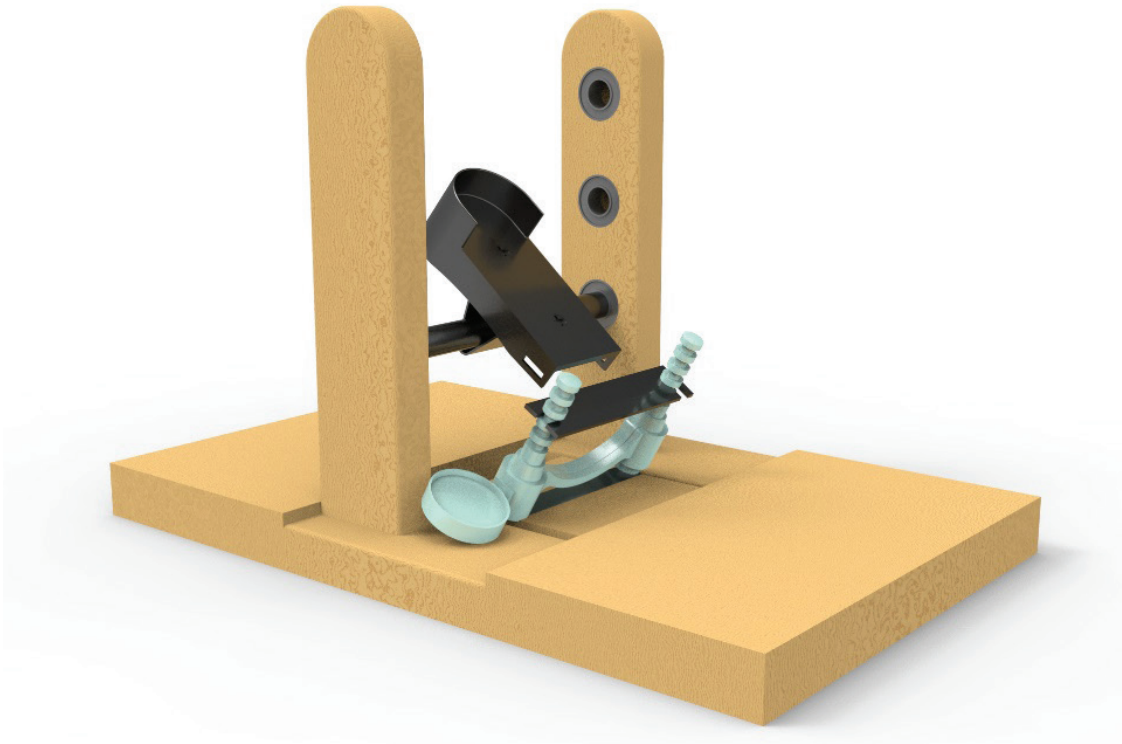


**Figure 1: Designing of the instrument in CRCO Software**

Once the designing of the instrument was done it is converted in to Finite Filament Analysis (FEA) in which the mashing of the design is done to analysis of the forces

Once the FEA was done the next stage is to do the structural analysis in which the hypothetical diagonal force of 100 N (9.8 Kg) was applied on the design to see the distribution of the forces. (Figure 2)

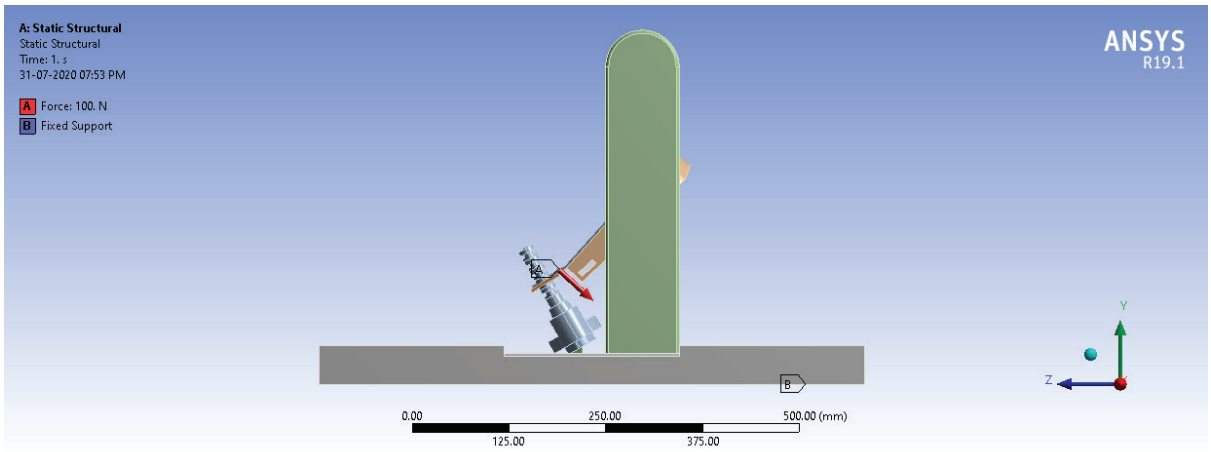



**Figure 2: Structural analysis with Diagonal Force of 100 N (9.8 Kg)**

The force analysis is explained with the help of different colour scheme where red shows the maximum Force and the Blue colour shows the minimum or no force, (Figure 3) This distribution is clearly shows the during the application of the force from the MTP joint the force is distributed on the direction of the intrinsic muscle that is inwards toward the planter aspect

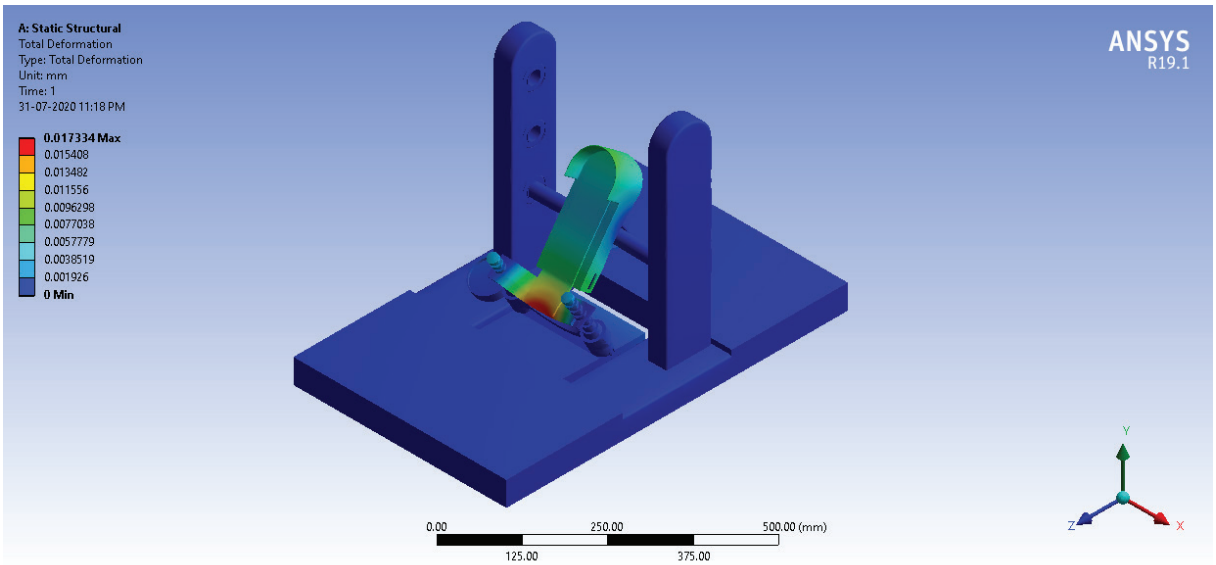



**Figure 3: Force Distribution of the device**

The design of the instrument is according to the biomechanical consideration which are deficient in previous design. The design has got 4 separate parts which are detachable and can be joined together to use the instrument these 4 different parts are:

A: Wooden frame

B. 2 Vertical wooden stirrups with 3 stainless steel bearing on each stirrup

C. A Metal footrest mounted in an iron road

D. Saehan Hydraulic Hand Dynamometer device

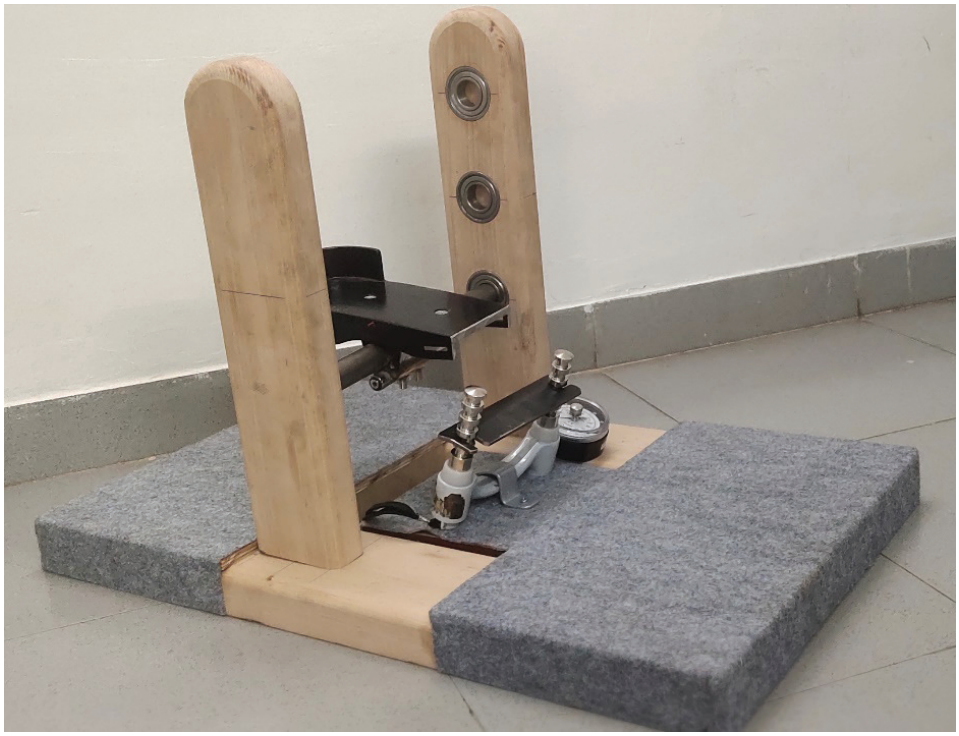


**FIGURE 4: Medical Device Prototype for Foot Intrinsic Muscles**

**Procedure**

The measurement of the muscular strength was done in the high siting with both the legs are parallel to each other and the testing foot is placed in the foot rest and maximum plantarflexion is achieved the ankle is scurred with the Velcro straps during the measurement, one the plantarflexion is achieved the subject should press the iron bar attached to the dynamometer and the reading can be measured. Subject should record 3 reading for each foot and the mean of these 3 reading can be taken as the value of intrinsic muscle strength in pounds (lb).

**Biomechanical consideration**

Design of the instrument is based on 2 major principles

1. We should provide the plantarflexion at ankle joint to cause disadvantage to extrinsic muscle[15]

2. Prevention of toe curling by using the iron strip as a force point in the dynamometer

**Isolation of intrinsic muscle**

To further strengthen our claim to position the foot in the plantarflexion the needle EMG was used to verify the activation in the intrinsic muscle while measuring the reading the abductor hallucis muscle is used for the insertion of needle. The Ethical Clearance of this procedure was taken from Ethics Committee, School of Physiotherapy, RK. University (ESR/259/Indt/GJ/2016) and the procedure is done by the Neuro physician. The movement of toe flexion with limit curling shows an activity in the testing muscle (Figure 7)

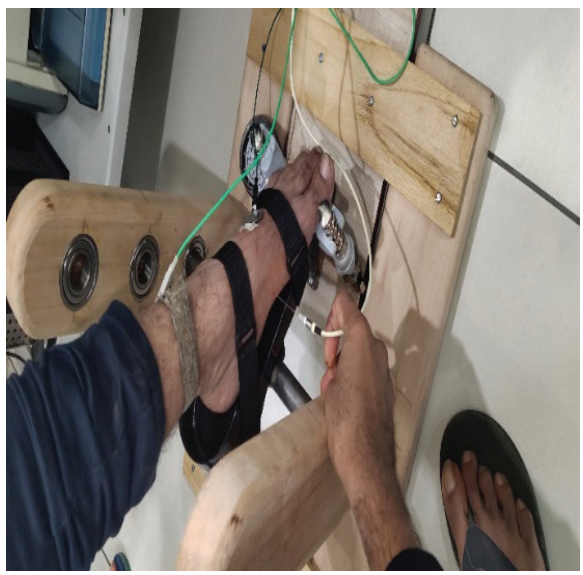


**Figure 5: Needle EMG for the Abductor Hallucis**

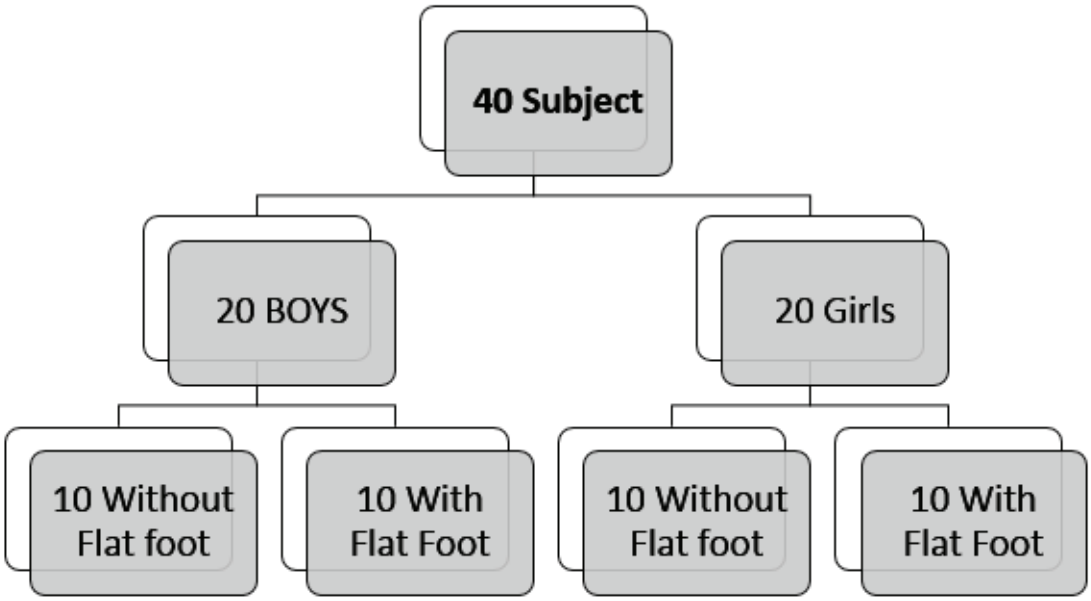
**One stop solution**

The purpose of designing this prototype is to provide one stop solution to foot intrinsic muscle impairments, this device not only quantify the intrinsic muscle strength but also provide a platform to demonstrate different exercise which are designed to strengthen or stretch the foot intrinsic muscle with the help of certain therapeutic devices

**Pilot Study**

To check the efficacy of the instrument a pilot study with this instrument to compare the planter intrinsic muscle strength of young boys and girls with and without Flat Feet. Total 40 subject were included in the study. All subjects BMI ranges between 18.5 and 24.9 Age is between 18-24 Years.

## Methodology




| **10 Boys without flat foot** | **10 Boys with flat foot** | **10 Girls without flat foot** | **10 Girls with flat foot** |
|---|---|---|---|
| BMI: 20.6 ±1.34 | BMI: 21.5 ± 1.0 | BMI: 20.3 ± 1.33 | BMI: 20.9±1.19 |
| Age: 20 years | Age: 20.4 years | Age: 20.8 years | Age: 20.8 years |
| Strength: 27.5 lb. | Strength: 21. lb. | Strength: 23 lb. | Strength: 15.3 lb. |

## Results and Discussion

The overall design of this prototype is convincing and fulfil all the biomechanical and clinical consideration apart from the testing and quantification of the intrinsic muscle the design also gives a therapist an opportunity to use this machine as exerciser for strengthening protocol and very beneficial in-home settings. The pilot study done to check the efficacy of the instrument in different gender and foot morphology also gave promising results described in the Table 1

Table 1: Description of the subjects in terms of BMI, Age and Strength

The result of this small pilot study clearly shows that the subjects with flat feet have less intrinsic muscle strength compared to the subject without flat feet or free from any foot deformity.

The initial results of the pilot study were encouraging and show the relationship between the intrinsic muscle strength and flattening of arch which will proved our claim that the the intrinsic muscle of the foot contributing in the maintaining of longitudinal arch and if the arch is flattened it is clearly reflected in the value of the strength compared to the subject having neutral healthy feet. The structural analysis of the machine also provide the support that the direction of the force is in the same direction as the direction of intrinsic muscle if they perform MTP Flexion. The quantification of these intrinsic muscle certainly opens the doors in the understanding the strength deficit associated with this muscle and we can design the strength program in accordance to the weakness of the muscle.

Further we should prove the reliability of this instrument in both the genders and various age group which is still not been done and we will be doing this research in the future as the validity of the instrument is already proved by the structural analysis also in the future there is a need to design a device to take care of other action of intrinsic muscle like abduction and also role of intrinsic extensor as per today understanding these extensor are rudimentary to the foot muscle function.

## Conclusion and Acknowledgement

We conclude that this porotype is an easy to use instrument providing not only the measurements of the intrinsic muscles of the feet but also provide the space for the exercise programme related to the intrinsic muscle and for the impairment associated with them.

The authors would like to thank Mr. Deepak Joshi, Mr. Rupesh M, Hardik wood Rajkot and Mechanical Engineering workshop at RK. University (students from the School of Physiotherapy) who made important contributions to this project.

**Ethical Clearance-** Taken from Ethics Committee School of Physiotherapy, RK University (ECR/259/Indt/GJ/2016)

**Source of Funding-** Self (The Saehan Hydraulic Hand Dynamometer provided by RK. University)

**Conflict of Interest:** Nil

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# Fire Safety Related Challenges Faced by Existing Hospitals: A Review

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## Abstract

**Background**: Hospital fires are real dangers and have historically caused life and property damages. A review of major research databases like Scopus, IEEE Xplore Digital Library, IET site, PubMed, Cochrane library and ASCE Library was conducted to explore fire safety challenges faced by existing hospitals and possible recommendations made thereof to overcome such challenges.

**Methods**: The review was conducted for key words- "Fire safety", "Hospital Fire", "Fire risk" and "Fire safety challenges". The search found 684 articles in total which were screened for relevance to research area and 27 articles were reviewed in detail.

**Findings**: There is poor enforcement of law by agencies. Retrofitting for conformance to fire safety regulations is difficult. Issue like faulty equipment, improperly kept inflammable material, evacuation difficulties due to higher acuity of patients, operational issues like maintenance of all fire safety equipment and installations, and training of staff, etc. are highlighted.

**Conclusion**: Focussed interventions and an all-encompassing fire safety risk management plan is the need of the hour. Significant insights into critical issue of fire safety is of immense benefit to healthcare professionals as a basis to make hospitals safe places.

***Keywords:*** *Fires; Hospitals; Maintenance and Engineering, Hospital; Legislation, Hospital; Operating Rooms; Risk Management; Disasters*

## Introduction

Statutes, codes and quality programmes govern hospital fire safety. Hospital fire dangers are real, widespread, and ever present.[1.] Hospital fires are global pandemic (Table 1). Operating-room fires have potential catastrophic outcomes.[2] In 2011-2015, US fire departments responded to 1,130 hospital fires that left 32 injured and caused damages worth US$8.8 million.[8] U.S. fire departments responded to an estimated average of 5,650 structure fires in or on health care properties per year. These fires caused an average of four civilian deaths, 160 civilian injuries and $44.9 million in direct property damage annually. AMRI Hospital fire depicts true picture that exists in India. It had glass façade, lacked windows and mechanical ventilation of centrally air-conditioned building was missing. Fire department had served notice on dangerous use of basement (LPG cylinders, mattresses and wooden boxes). With three months deadline to comply, it did not. Staff didn't inform fire brigade for nearly $1^{1/2}$ hours. Smoke detector and fire alarm system were kept non-operative out of ignorance or oversimplification.[9]

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**Table 1: Hospital Fires**

| Hospital | Deaths | Year | Cause |
|---|---|---|---|
| State-Run Hospital, Lahore3 | 4 | 2012 | Short circuit 10 |
| AMRI Hospital Kolkata | 95 | 2011 | |
| Bei-Men, Sinying Hospital, Taiwan,5 | 13 | 2012 | |
| PBM Hospital, Bikaner | Nil | 2013 | Faulty electric wiring |
| Rajendra Hospital, Patiala | 5 | 2013 | Short circuit |
| Moscow Psychiatric Hospital3,6 | 36 | 2013 | |
| Guru Teg Bahadur Hospital, Delhi | Nil | 2013 | Fire in A/C unit |
| Galaxy Care Hospital, Pune | | 2013 | Short circuit |
| Safdarjung Hospital, Delhi | | 2013 | |
| Psychiatric Hospital, Luka, Russia3 | 37 | 2013 | |
| Orthopaedics Hospital, Southern Japan3 | 10 | 2013 | |
| Shishu Bhawan hospital, Cuttack4 | Nil | 2015 | Fire in new-born warmer11 |
| SUM Hospital, Bhubaneswar4 | 22 | 2016 | |
| Murshidabad Medical College Hospital, West Bengal,7 | 3 | 2016 | Faulty electric wiring7 |

Fire safety encompasses beyond building plan. Hospitals fail to incorporate basic components, viz. planning for critical supplies or ways to evacuate patients off-site. By drawing attention to these issues, hospitals can identify weaknesses in current plans and better prepare for a successful evacuation.[12] Catastrophic potential of fires and a tendency of history to repeat itself called for a review of fire safety challenges faced by existing hospital.

## Methods

A review of major research databases like Scopus, IEEE Xplore Digital Library, IET site, PubMed, Cochrane library and ASCE Library was conducted for key words- "Fire safety", "Hospital Fire", "Fire risk" and "Fire safety challenges" to explore fire safety challenges faced by existing hospitals. The search found 684 articles in total which were screened for relevance to research area and 27 articles were reviewed in detail to examine various challenges faced by existing hospitals and recommendations to overcome them.

## Results

### Challenges

There are problems with law enforcement.[3] Hospitals lack fire prevention measures. No objection certificates (NOC) from fire department were not renewed as it did not entail major penalty.[9] There are no follow-ups with fire department on maintenance of fire alarms/ sprinklers.[13] Health facilities do not fully complied with relevant construction codes and compartmentation for movement to safer area to await rescue.[14]

Facilities built on previous standards faced losing license due to new regulations of patient's room size.[15] Equipment sensitive to vibration/moisture, ongoing

patient procedures, and active HVAC systems are critical and cannot be easily shut down. Dust and water, containing bacteria and spores, when dispersed infect patients. Dirt on workers, contaminated carts and materials cause diseases such as aspergillosis. Poor ventilation/filtering of air affect indoor air quality of patient rooms.[15]

Emergency response mechanism did not meet international best practices (fire station every 3 kms). Response time sometimes exceeded beyond 30 minutes (upper limit of 3 minutes).[9] Funds are needed to upgrade fire equipment and manpower skills.[9] Mock fire drills take place occasionally and in metro cities only.[9] A woman died when rope snapped during mock drill.[9,16] Fire station facilities were not acquainted with facilities, its location and specific hazards.[6]

Heavy casualties occurred as patients on life-support couldn't be moved. Small hospitals have transformed into special care environments, ill-equipped to deal fire emergency due to inadequate fire protection facilities, fire safety equipment, and human resources.[5]

There is poor planning and management of fire safety issues.[3] Emergency preparedness plans did not exist, fire risk assessment not conducted and there was no fire safety planning or monitoring. Hospitals lacked "no smoking" policy and fire reporting procedures.[6] Health facilities lacked adequate fire risk assessments.[14] Role of security services is unclear.[3] Emergency contact details are not readily available with hospitals.[6] Fire extinguishers, automatic sprinklers,[3] fire/smoke alarms and sign boards for directing emergency evacuation were not available. Fire exits were either not available or exit signs/routes not illuminated. Electrical switches/ circuit breakers were not identified and electrical cords/ plugs were not maintained.[6] Combustible material were improperly stored and corridors were not free from clutter. Chemical containers were not labelled as "flammable".[6] Combustible construction material is an issue.[3] Competent persons for managing fire incidents were not deployed and firefighting employees were either not identified or inadequately trained.[6] Performance by hospital staff with respect to fire safety and management is poor.[3]

Newer technologies viz. linear accelerators and robotic surgical tools pose problems as these require larger space and sometimes located in areas already tight and not specifically designed.[17] Alcohol-based disinfectants are located throughout facilities, including exit corridors.[17] For security of infants, children and psychiatric patients, egress doors are kept locked.[17]

Laser and electrocautery have reintroduced risk of surgical fires.[18,19] Many otolaryngologists (25%) have experienced operating room fire.[20] Most OR fires involve cautery/lasers. [21] Most fires (81%) occurred while supplemental oxygen was in use. [20] Airway fires result from combination of oxygen-rich environment, flammable material, and heat source during surgery.[19, 21] Each healthcare worker owns a part of fire triangle. Fuel source is typically provided by circulating nurse, e.g. flammable prepping agents,[2] tinctures; drapes[2], other combustibles, GI gases (mostly methane), etc.[21,22] Surgeon supplies ignition source through fibreoptic light sources, sparks from surgical drills/burrs, flexible endoscopes, etc.[21, 22] High fire risk surgeries are oropharyngeal surgeries; surgeries on head or neck[2], face, cataract; endoscopic laser surgeries; cutaneous/ transcutaneous surgery; tracheostomy and burr hole surgery.[20, 23]

Evacuation time draws major attention because of diverse population, mix of patient conditions, and multiple units on one floor.[24] Internal movement challenges included non-functioning elevators, compromised access to stairwells/evacuation routes, and failed lighting and electrical circuits. Finding appropriate transport mode for patients to alternative site were complicated, esp. where multiple evacuations occurred simultaneously.[25] In case of non-functional elevators, vertical evacuation is compromised.[12] Health facilities lacked adequate ability to evacuate.[14]

Communication is the major contributor to evacuation success.[12] Challenges include congested telephone circuits, failure of emergency equipment, and difficulties communicating fire/police agencies. False information about a non-existing tent hospital at evacuation site led to patients being dropped there.[12] Absence of sheltering agreements led to widespread confusion tracing patients following evacuation.[12] A central command post or a pre-arranged transfer agreement facilitated search for appropriate shelter sites.[25] Confusion of roles and no designated decision

makers pose major problems in disaster response.[26]

Non-availability of medical records has led to rescuing hospital receiving patients without basic identifying information, illness unawareness and mismatch of services, e.g. evacuation of dialysis patients to a hospital not having such services.[12] Failure to maintaining an accurate visitor, patient and staff census during an evacuation can leave hospitals vulnerable to significant disruptions during evacuation.[12] Post evacuation, a system is required to ensure return of equipment.[12]

There is a dilemma about evacuated priority, healthiest or sickest.[12,27] It is difficult to determine evacuation mode if no plan exists.[28] Some evacuated sickest first and others healthiest.[12] Critical patients can only be moved to specific locations. Mix and changing patient acuities pose difficulty in planning evacuation.[28] Impaired patients cannot evacuate without assistance.[17,29]

Functional ability of staff is compromised due to the threat itself. Since continuing care requires resources, it further complicates evacuation.[28] Training is not provided for temporary staff.[30] Weaknesses in unit design with inadequate escape routes, ventilation cut-outs and fire doors; and lack of portable monitoring equipment and emergency drug supplies are reported. Evacuation plans were often limited in scope for e.g. staff expected to remain on floor and plans were not rehearsed.[30] Anxiety impairs evacuees' ability to select appropriate routes.[31] Occupants don't know how to react to a fire alarm. For wayfinding, occupants seek help of staff who should be well trained to instruct patients.[32] Return to a facility that is under repair or missing staff poses different set of challenges.[12]

A systematic review found that strength of evidence was insufficient, and effect for interventions like education, equipment, patient safety course or team training and risk assessments was not estimable.[19]

## Discussion

Lessons from history signify that even old hospitals should comply with existing laws.[3] Knowledge of and implementation of codes/standards are recommended for keeping a hospital fire from becoming a disaster.[1]

Installation and maintenance of automatic fire systems are critical in fire safety.[1,3] Sprinklers lead to 75% reduction in property damage.[8] Fire alarm systems must be designed for early detection, accurate location annunciation, fire department notification, and control of high voltage alternating current system, and elevators.[33]

There should be a strategy for fire prevention and emergency response procedures, including counter-measures for fire risk assessment, management, and emergency response, in order to improve fire safety.[5] More practice implementing plan would be beneficial.[26] Staff should be prepared in handling myriad complexities of evacuation, including ethical considerations. A physician was accused of killing four sickly patients with sedatives.[12] Standardisation as Code Red is recommended.[34] Staff training is critical to fire safety.[3] Conducting frequent drills is recommended.[1]

A unified, centralised command structure, single authority and clearly responsibilities contribute to successful evacuation. Simple, flexible disaster plans with minimum staffing is needed. Development of "fire-safe" elevators to assist evacuation is recommended.[35] Policies should guide order of evacuation.[12] Switching policy is suggested beginning with non-critical (never optimal to split evacuation teams).[27] Robust evacuation planning should address changing patient acuities.[28] For patients unable to evacuate without assistance "defend-in-place" strategy may be developed.[17,29] For vertical evacuations, methods include dragging patients on sheets using mattresses on stairwells, formalised sheet and mattress method, specialised med sleds, plastic sheets, etc.[12] There should be established escape route plans.[3] Effective guidance help reduce negative impacts of anxiety on route choices.[31]

Communication protocols should be established in advance with multiple redundancies (messengers, telephones, portable radios, cellular telephones, satellite communications, runners and volunteer radio operators).[12] Short text messages may be used. Public information officer and liaison with media can avoid miscommunications.[12]

Local NGOs can assist hospitals in evacuations.[12] MoUs with other hospitals and vendors allows smooth evacuations and availability of critical goods/services.

Central log at Incident Command can help

effective tracking and ensuring that medical records are available.[12] Evacuation packs may contain worksheets, phone numbers, medication, transport equipment, and disposable supplies.[12]

Operating room fire safety guidelines have been recommended such as, nonconductive plastic clamp, adjusting setting to avoid sparks, never using cautery to enter trachea, using air or air/oxygen mixtures in anaesthetic gases, avoiding nitrous oxide especially during bowel surgery, avoiding "tenting" of drapes, stopping supplemental oxygen one minute before using cautery on head and neck, etc. [21]

A centralized reporting system should be developed to catalogue events. Standardized root cause analysis will help to elucidate circumstances by which a sentinel event took place.

## Conclusion

Multiples challenges compromise fire safety in hospitals- law enforcement, retrofitting, modifications in facilities, poor preparedness, newer hazards, etc. Hospitals need focussed interventions and an all-encompassing fire safety risk management plan is the need of the hour. Significant insights into critical issue of fire safety is of immense benefit to healthcare professionals as a basis to make hospitals safe places.

**Conflict of Interest:** Nil

**Acknowledgements**: Nil

**Source(s) of support:** Nil

**Ethical Clearance:** Not required

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# Body Mass Index, Modified Bishop Score and Transvaginal Sonographic Measurement of the Cervical Length as Predictors of Successful Induction of Labour by Misoprostol

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## Abstract

**Introduction:** All through the world, induction of labour fails in 20% of cases and thus cesarean section is performed. Obesity is a risk factor for undesired results of pregnancies. Although the Bishop score is simple and easy to apply, it is a subjective evaluation method and results may vary according to the clinical experience of the person applying it. Transvaginal cervical measurement can be more objective criterion in assessing the success of labor induction. We aimed to identify the proper characteristics of the pregnant women, which can go for successful induction of labour.

**Method:** Induction of labor for 100 women using vaginal misoprostol was done following identification of their BMI, modified bishop score and transvaginal cervical length. All women were pregnant ≥38 weeks, singleton, cephalic presentation, intact fetal membranes.

**Results:** About 92 women had successful induction of labour (group 1) while the remaining eight women had failed induction (group 2). BMI did not show statistical significance however, the modified Bishop score and the transvaginal cervical length showed high statistical significance. Using the modified bishop score 2 as a cutoff value showed sensitivity 89.1%, and specificity 62.5% while using the transvaginal cervical length 2.65 as a cutoff value showed sensitivity 72.8% and specificity 100%.

**Conclusion:** Induction of labour by vaginal misoprostol is very promising in term women providing identification of their modified Bishop score and their transvaginal cervical length.

***Keywords:*** *Induction of labour; BMI; modified Bishop score; transvaginal cervical length; misoprostol.*

## Introduction

Induction of labour is a method of timed delivery of the fetus that can be requested in certain circumstances. It was obviously seen how the induction of labour differ from an area to other and is applicable is an increasing manner. In the United States and Canada, it reached more than 20% [1].

Assessment of the cervix is a crucial prognostic factor for the outcome of labour induction. Once labour starts, many changes were detected in the cervix matter involving the influx of certain chemicals into the cervix and efflux of special materials that dismantle the collagen, remodeling the cervical tissue. In addition, it has been detected prominent changes in the level of glycosaminoglycans and release of cytokines [2].

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In 1964, a "pelvic score" was published, now known as the Bishop score, which described a patient's suitability for elective labor induction. This idea was based on the assessment of cervical factors including dilatation, effacement, consistency, position and station. He concluded that labour induction was successful if the total Bishop score reached 9 or beyond. Time induction of labour was suitable for multiparous women who reached 37 weeks gestation and this examination showed an adequate size fetus with head down presentation. Despite that, this scoring system was in common use in any pregnant woman not strictly the term. Although all the changes to the original Bishop' score, this first score stand to the common one used in practice [3].

Successful induction was closely related the woman weight. It was prominent that candidates with a weight on the lower side have more the chance to have a vaginal delivery within 12 and 24 hours of start of induction and those with weight on the higher side are more prone to end up by a cesarean n delivery even if multiparous [4].

Many obstetricians have been in circumstances requiring a timed delivery of their patients and so they tried a plenty of methods. The main idea was to deliver their patients by vaginal delivery and this occur by bringing uterine contractions in a uterus already in a quiescent state. The rate of labour induction has risen up in the United States in the last decades and the number of induced women has reached more than the double by 2009. These enormous changes in practice were related to many factors including from one side the candidate compliance and from the other side the plenty of methods used for induction [5].

Our study was aiming to identify the proper criteria of the candidate, which can go for successful induction of labour.

**Methods:**

This prospective study was conducted on 100 women who attended a private hospital between October 2012 and December 2015 after approval of the ethical committee of the national research centre. The inclusion criteria involved full-term pregnancy (≥38 weeks) with a single, living fetus of cephalic presentation, intact fetal membranes. The exclusion criteria involved women with previous caesarean section, cephalopelvic disproportion, placenta previa or vasa previa, transverse fetal lie, prolapsed umbilical cord, multifetal gestation, abnormal fetal heart rate patterns requiring emergency delivery, estimated fetal weight ≥4 kg, fetal demise, chorioamnionitis, and previous uterine scar.

First, each woman was assessed, by taking full history and examination, to check her age, weight, height, parity, gestation and for any medical problem. The study population was categorized into six classes of BMI=weight/height$^2$ (kg/m$^2$), based on the WHO definition; underweight <18.5, normal weight 18.5–24.9, overweight 25–29.9, class I obesity 30–34.9, class II obesity 35–39.9 and class III obesity ≥40.

Via the ultrasound machine Sonoace R7 (Samsung Medison, Korea), transabdominal ultrasound was performed for each woman to obtain the fetal biometry as well as the fetal weight using the formula by Hadlock. Using a 5 MHz transvaginal probe, the cervical length was measured twice in the sagittal plane along the length of the endocervical canal with simultaneous visualization of the internal and external cervical os, and then the mean of the two measurements was calculated.

All women were informed about the induction procedure including the use of misoprostol and its potential risks (hyperstimulation, uterine rupture and the possibility to fail and go for caesarean section). A digital vaginal examination was done to identify woman's modified Bishop score, which includes; the cervical dilatation, station, consistency, position as well as the cervical length, which has replaced the item "effacement" in the original Bishop score.

Each woman was subjected for external cardiotocography (CTG) for 30 minutes before starting induction. A dose of 50 micrograms of misoprostol is put intravaginally and repeated after 6 hours if no progress occurs (maximum dose of misoprostol was 100 mcg). External cardiotocography (CTG) was performed intermittently (every 30 minutes) to assess the fetal well-being and the uterine contractions. Once the woman started to have efficient contractions (3-4 contractions during 10 minutes), cervix dilated 3 to 4 cm and the patient started to feel pain, no more misoprostol was given.

A Foley catheter was inserted as a full bladder may interfere with fetal head descent and it was a way of assessment of the patient degree of hydration. Continuous CTG tracing was done and vaginal examination was repeated every 2 hours to assess the progress of labour. Amniotomy was done once the patient reached 5 cm as a mean of accelerating the progress of labour. All data

were registered in a portogram to follow the progress.

When oxytocin augmentation was required, a minimum interval of six hours was recommended after the last misoprostol dose. However, augmentation with oxytocin was not used in this study except if the patient did not experience regular uterine contractions during the 1st hour following amniotomy. Oxytocin was used mainly during the second stage of labour.

All data were properly collected, tabulated and statistically analyzed using computer program SPSS (Statistical Package for the Social Science; SPSS Inc., Chicago, IL, USA) release 25 for Microsoft Windows. Data were statistically described in terms of mean ± standard deviation, or frequencies (number of cases) and percentages when appropriate. Comparison of numerical variables between the study groups was done using Student t-test for independent samples in comparing normally distributed data. Accuracy was represented using the terms sensitivity and specificity. Receiver operator characteristic (ROC) analysis was used to determine the optimum cut off value for the studied diagnostic markers. P values less than 0.05 was considered statistically significant.

## Results

This study involved 100 women that fulfil the inclusion criteria. Regarding the patient characteristics, the mean ± SD for age and gestational age for all participants were 29.65 ± 2.63 (in years) and 39.06 ± 0.75 (in weeks) respectively. There were 74 primigravida women and 26 second gravida women.

Successful induction using vaginal misoprostol was approved in our study when the patient reached the second stage of labour (fully dilated cervix) without fetal or maternal distress. About 92 women had successful induction of labour and reached the second stage of labour (group 1) while the remaining eight women had failed induction (group 2). Among group 1, 89 cases ended by successful vaginal delivery and only three women failed to deliver vaginally and delivered by CS due to arrest of fetal head descent despite fully dilated cervix, as the trial of instrumental delivery was not an option in our study.

The BMI of all women was 29.6 ± 3.72, and only 4% of them had normal weight, 49% were overweight, 38% were class I obesity and 9% were class II obesity. This diversity in BMI did not affect the success of labour induction. As regards the modified Bishop score, 4% of women had score 0, 11% had score 1, 2% had score 2, 44% had score 3, and 21% had score 4. The modified Bishop score showed a significant statistical difference. As regards the transvaginal cervical length, 13% of women had cervical length ≤2 cm, 61% had cervical length 2.1-3 cm, and 26% had cervical length >3 cm. The transvaginal cervical length showed a significant statistical difference as shown in table 1.

Figure 1 shows that using the modified bishop score 2 as a cutoff value showed sensitivity 89.1%, and specificity 62.5% while using the transvaginal cervical length 2.65 as a cutoff value showed sensitivity 72.8% and specificity 100%.

**Table 1: Comparison between both groups as regards age, gestational age, BMI, modified Bishop score, and transvaginal cervical length:**

| | **Successful Induction (Group 1, n=92)** | **Failed Induction (Group 2, n=8)** | **P-value** |
|---|---|---|---|
| Age (in years) | 29.67 ± 2.64 | 29.38 ± 2.67 | 0.760# |
| Gestational age (in weeks) | 39.07 ± 0.77 | 39 ± 0.54 | 0.757# |
| BMI | 29.79 ± 3.6 | 27.49 ± 4.67 | 0.211# |
| Modified Bishop score | 2.77 ± 0.99 | 1.5 ± 1.07 | <0.001* |
| Transvaginal cervical length | 2.46 ± 0.47 | 3.34 ± 0.26 | <0.001* |

Normally distributed variables are represented as mean ± SD and paired t-test was used

#: No significant difference (P-value > 0.05)

*: Highly significant difference (P-value < 0.001)

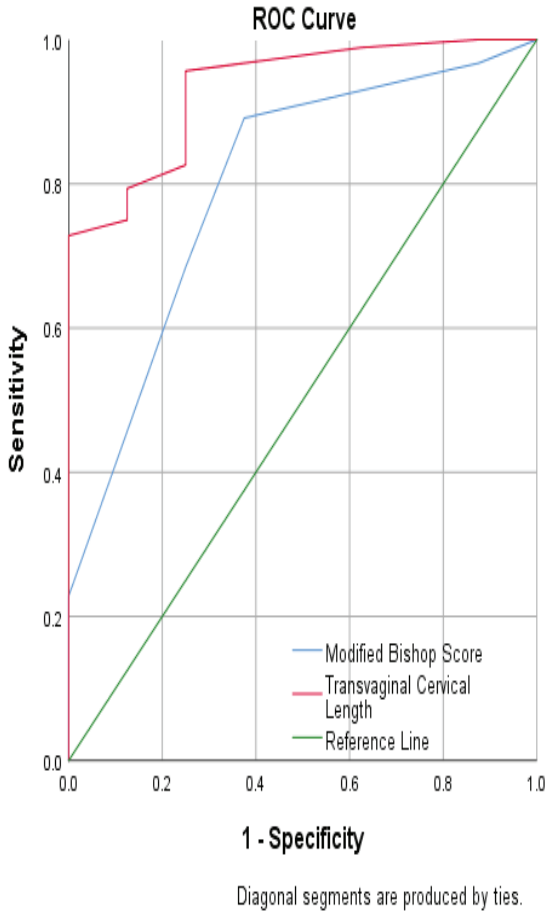


**Figure 1: ROC curve of modified Bishop score and transvaginal cervical length**

## Discussion

The idea of our study was to determine the proper criteria of the candidate, which can go for successful induction of labour, and avoid waste of time or risky trial for induction of labour if the candidate is better to go for caesarean section from the first assessment.

We had chosen 100 women of smooth antenatal course, no medical comorbidity, with singleton pregnancy of cephalic presentation and intact fetal membranes. Counseling was in details. We identified 3 parameters from each patient (BMI, transvaginal cervical length and modified Bishop score) before starting the induction by vaginal misoprostol. Each patient was under close monitoring using CTG tracing to follow the progress of labour. We had 92% success of induction.

The choice of vaginal misoprostol for induction agreed with Sareen who conducted a study on term patients by vaginal misoprostol 50 mcg. He concluded that the use of misoprostol showed an evident decrease in the time to the delivery of the baby following using the insert, without causing harms to him or changing in the number of caesarean sections [6]. Besides, Danielian used the misoprostol vaginal insert as a method of induction in his study and put down a conclusion that misoprostol with a dose 50 µg inserted in the vagina is more effective than 1 mg dinoprostone vaginal gel, with no apparent drawbacks on the route of delivery, or on the baby [7].

Regarding each of the 3 selected parameters, the BMI didn't show in our study any statistical significance (p value=0.093) which means that it is not advised to take BMI of the patient before induction of labour as it doesn't show any impact on its success. However, the modified Bishop score and the transvaginal cervical

length showed significant statistical difference as shown previously (P value were 0.001 and < 0.001 respectively).

Yousuf et al, in 2016, agreed with our previous findings, as they ran a retrospective study to assess the drawback of obesity on pregnancy and labour. They recruited data of all patients who booked in the end of their first trimester and required timed delivery during the year 2012. The candidates were divided into two groups; the first group involved those with BMI less than 23 and the other group included the cases whose BMI 23 or more. They denoted that increased weight required induction of labour due to medical condition. The study showed that the primigravida women had more chance for caesarean section(odds ratio 1.45), the length of caesarean section and loss of blood during the procedure were not obviously associated with body mass index on the higher side(p>0.05). Obesity may have some concerns in primigravida women, but it did not have major effect [8].

Pevzner et al, in 2009, disagreed with our findings. Their study idea was to appraise the different features either maternal or pregnancy related that solely expect to end up in vaginal delivery and is what they meant by the target of induction of labour. The study was a secondary analysis of the data collected during the Misoprostol Vaginal Insert Trial, a multisite, double blind, randomized trial of women requiring cervical remodeling before induction of labor. The study first aim was to collect the candidate criteria who deliver by vaginal route following induction. About 72 % of the induced patients subsequently had vaginal deliveries. The parous candidates (P<.001, statistically significant), BMI below 30 (P<.001, statistically significant) and height exceeding 5'5" (statistically significant) baseline modified Bishop score of 4 (P=.047, statistically significant), and fetal weight below 4,000 g (P<.001, statistically significant) were identified as strong prognostic factors once seeking a successful induction of labor. Each of these criteria was subjected to logistic regression analysis independently. Besides that, it was perceived that the age group beyond 35 and the Hispanic race favor a successful induction in contrary to the African-American race which was linked to a higher incidence of delivery by caesarean section (P value less than 0.05 so it is statistically significant). Therefore, they affirmed lastly that the candidate 's characteristics such as BMI, parity and age are crucial parameters to be checked once looking for a successful induction of labor, and this disagreed with our findings. On the other hand, they confirmed that neonatal birth weight is an important prognostic variable regarding the success of induction and this finding agreed with ours [9].

Pandis et al., in 2001, agreed with our findings. They used to identify the rapport between the cervical length as measured by the transvaginal ultrasound as well as the bishop score. Following that, they matched these data to candidates who were induced for delivery and end up with successful vaginal delivery. This idea rose from the process that the decision to timing delivery under certain situations is overspreading. Despite that, around 20% of induced candidates end up by a caesarean delivery [10].

## Conclusion

Induction of labour by vaginal misoprostol in term pregnancy is a highly promising decision. However, counselling of the woman should be based upon identification of her modified bishop score and her transvaginal cervical length. Assessment of BMI of the candidate before induction of labour is not feasible. Further studies on larger prospective studies are required to emphasize our conclusion.

**Acknowledgment**: We would like to thank our colleagues from Faculty of Medicine, Cairo University who provided insight and expertise that greatly assisted our research.

**Ethical statement**: This study was approved by the Medical Research Ethics Committee of the National Research Centre, Cairo, Egypt, and all subjects gave their informed consent.

**Consent for publication:** The manuscript has not been previously published or submitted to another journal for publication. All authors have seen and approved the manuscript being submitted.

**Conflict of Interest**: None of the authors has a financial or any conflict of interest.

**Funding:** This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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# In Potential Siliko Simulation of Clorogenic Acid in *Coffea canephora* to Transfering Macrophage Polarization of M1 in Tuberculosis Infection

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## Abstract

The aim of this study to determine the potential of *Coffea canephora* by using chlorogenic acid (CGA) compound associated with macrophages polarization in tuberculosis condition. Exploration of compound by using the Knapsack database and Dr. Duke. Analysis of CGA by using a PASS server with the results ranged score 0-1 probability to be active score. Molecular binding docking receptor and ligand were used Autodock PyrXv9.5 and interactions between molecules using CLUSPRO 2.2. Potential activities of CGA compounds was 3,5-*dicaffeoylquinic acid*, *feruloylquinic acid*, and *p-coumaroylquinic acid* with Pa value close to 1, this indicates that the accuracy of prediction of antioxidant activity was quite high. The results of docking through the attachment pathway of several amino acids showed the potential for side methylation activity 'which is able to reduced DNMT1 activity thereby suppressing the anti-inflammatory process. Protein interactions based on affinity values were higher among DNMT1 and STAT1 bonds compared to STAT6. The results of the study concluded that the active compound in *Coffea canephora* was involved in the function of the immune system and it related to the inflammatory process. It is triggers the delivery of antimicrobial cytokine signals and increased antioxidant, it is very necessary in healing tuberculosis disease process.

***Keywords:*** *Coffea canephora, Chlorogenic acid, Inflamation, DNMT1, STAT1, Tuberculosis*

## Introduction

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis* (Mtb) that attacks the lungs and causing pulmonary TB and if it affecting other parts of the body is called extra pulmonary TB [(1).]

The prevalence of TB patients in Indonesia was 297 per 100,000 people, with a mortality rate of 69,000 people per year [(2)]. In 2013 an estimated 480,000 people worldwide progressed towards MDR-TB and an estimated 210,000 died due to this disease [(3)]. The number of new TB cases in Indonesia was 420,994 cases in 2017 with male are more dominance than women[(4)].

XI. Mtb is an intracellular pathogen that lives and develops in macrophages where the stages of immune response to bacterial infections are complex. Inflammatory cytokines such as tumor necrosis factor alpha (TNF-α) and IL-1 play a major role in the defense of immunity against (Mtb) [(5)]. Innate immunity plays an important role as a host defense against Mtb that begins the process of introducing Mtb by innate immune cells against pathogen associated with molecular patterns (PAMP) through their pattern recognition receptor (PRR) [(6)].

Mtb hijacks host mechanisms defense by using manipulating host cellular pathways, innate immune responses, and cell death pathways to take an advantage [(7)]. Macrophages are very important cells in TB infection because their will involve in Mtb phagocytosis process and as an initiation of immunity by adaptive T cells. Elimination of Mtb by macrophages can also through the reactive oxygen forms and nitrogen species, phagosome acidification, and phagosome lysosomal fusion [(6)].

Involvement of macrophages (M) is a complex process with two types of macrophages, it are

macrophage1 (M1) and macrophage2 (M2) was described the main activities that contradict each other and innate immunity controls toward adaptive immunity and not vice versa [8]. The M1 and M2 communication lines in the polarization direction are based on the activities of STAT1 and STAT6. The main activities of NF-κB and STAT1 are promote polarization towards M1 producing pro-inflammatory function [9].

Coffee contains large of CGA, it is a group of quinic acid esters of phenyl propenic acid, especially caffeic acid and ferulic acid. 5-O-caffeoylquinic acid (5-CQA) is the largest of chlorogenic acid of 3-O-caffeoylquinic acid (3-CQA) and 4-O-caffeoylquinic acid (4-CQA) in coffee [10]. *Coffea canephora* species are coffee species that have the highest variability in the genus coffea [11]. Empirical data showed that the average levels of chlorogenic acid were lower in Arabica coffee extracts, while average levels of *coffea canephora* was higher [12].

Based on previous studies in vitro CGA induced LPS or IFNγ but inhibited gene response to IL-4 production by promoted STAT1 signaling and inhibited STAT 6 signaling [13]. In silico test described that CGA has a potential to interact with DNA methyltrasferase enzyme and several proteins associated with transducer sinyaling and transcription activators such as STAT1 and STAT6 and IFNGR1 genes that affected transcription of IFNγ cytokine proteins.

## Method

Exploration of the content of the Chlorogenic acid compound Coffea canephora

The compound content of the coffee family is explores by using KnapSack database (http://knapsack3d.sakura.ne.jp/) and from the duke database (https://phytochem.nal. Usda.gov/p hytochem/search/list), which obtained from various published literatures.

**Potential of Chlorogenic acid**

To find out the potential of CGA, an analysis carried out using a PASS server (http://www.pharmaexpert.ru/passonline/index.php). The score obtained from the PASS server in the form of Pa (probability to be active) has a range of 0-1. The higher the score or more than 0.7 is interpreted the more accurate the prediction of its potential activity with the in vitro / in vivo test.

**Sample acquisition and molecular docking analysis**

3D samples of DMNT1 protein (PDB ID 4WXX), STAT1 (PDB ID 1YVL chain A), and STAT6 (PDB ID 5D39 chain A) were obtained from RCSB GDP database (https://www.rcsb.org). While the 3D structure of CGA (ID: 1794427) was obtained from the PubChem compound database (https://pubchem.ncbi.nlm.nih.gov).

To find out the binding affinity between CGA and DNMT1 protein, molecular docking analysis was carried out between receptors and ligands by using Autodock PyrX v9.5, while molecular interactions occurred between DNMT1 and STAT1; STAT6 and NFKB1 and STAT1; STAT6 were performed docking by using CLUSPRO 2.2 software. The approach taken form of blind docking without using an active side receptor. To determine the bond strength parameter is the highest score from the docking results in form of binding affinity scores. Docking should specifically by imitating the binding site DNMT1 inhibitor 5-Aza-2'-deoxycytidine as a control. The more negative docking result, mean that the stronger the bond occurred. Ligplot software was used analyzed the determination amino acids.

## Findings

**Potential of Chlorogenic acid as an anti-inflammatory**

Based on the analysis, CGA and several major groups of CGA include 3, 5-dicaffeoylquinic acid, feruloylquinic acids, and p-coumaroylquinic acids which have a high potential for anti-inflammatory activity, with score more than 0.6. Pa value or close to 1 indicates the accuracy of the prediction of anti-inflammatory activity.

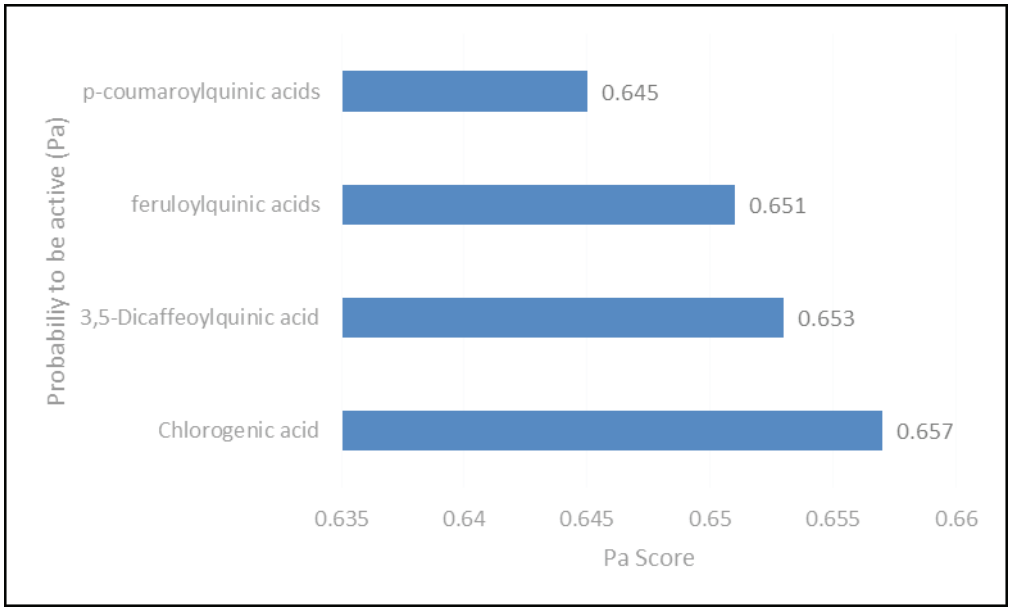



**Figure 1. Potensial prediction of anti inflamatory of CGA.**

### Molecular docking of Chlorogenic acid and DNMT1

Based on molecular docking results, CGA had a stronger binding affinity compared to DNMT1 inhibitors, 5-Aza-2'-deoxycytidine, with -8.3 kcal / mol of score (Table 1). The adhering side of CGA and DNMT1 inhibitors were in the same place (Figure 2), namely in amino acid GLU 562, ASP 565, GLU 566, ASP 569, SER 570, PRO 574, GLY 593, GLN 594, VAL 658, GLN 687 , ARG 690 (Figure 3). This showed that CGA had same potential as DNMT1 inhibitors which is it can carry out methylation activity on the 5 'side of cytosis so it can reduce DNMT1 activity and suppress the inflammatory process in macrophages

**Table 1 Binding affinity between DNMT1 and Chlorogenic acid**

| **Receptor** | **Ligan** | **Binding affinity (kcal/mol)** |
|---|---|---|
| DNMT1 | 5-Aza-2'-deoxycytidine (control) | -6.6 |
| | Chlorogenic acid | -8.3 |

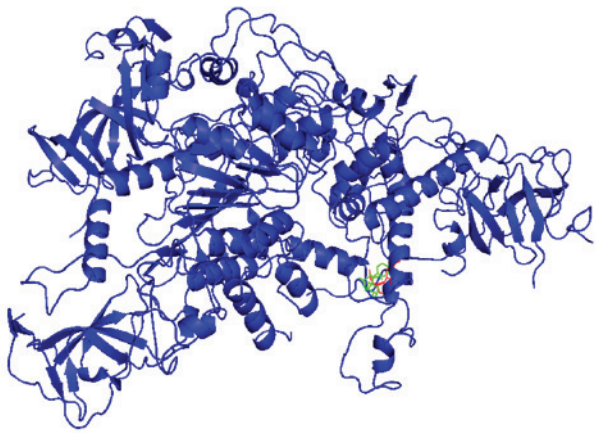


**Figure 2. Docking complex between DNMT1 (ribbon; blue) and CGA (lines; green) also DNMT1 inhibitor (lines; red)**

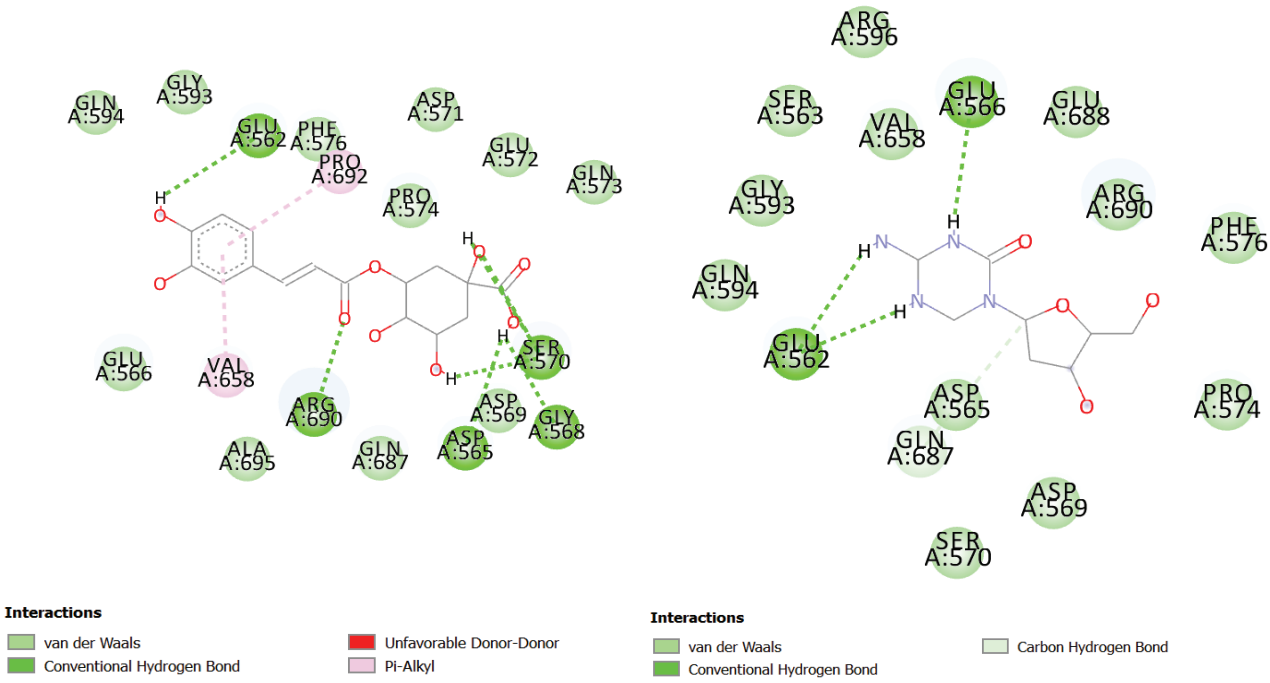
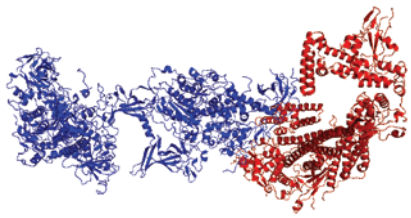
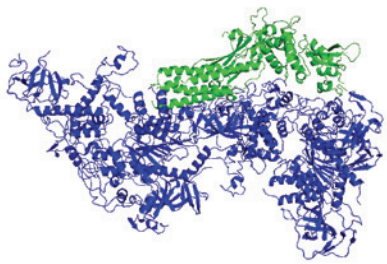



**Figure 3. Amino acid Interaction between DNMT1 - 5-Aza-2'-deoxycytidine (let) and DNMT1- Chlorogenic acid (right)**

**The interaction of macrophage polarization proteins DNMT1 and STAT1, STAT6**

The results showed that DNMT1 had a tendency to bind STAT1 compared to STAT6, this indicated by the results of a higher affinity value -1118.6. The same thing is observe in NFKB interactions that tended to bind STAT1 with an affinity value -941.1 (Table 2).

**Table 2 Interaction of DNMT1 protein, STAT1 and STAT6**

| Receptor | Ligand | Binding Affinity (E-Total) |
|---|---|---|
| DNMT1 (blue; cartoon) | STAT1 (red; cartoon) | -1118.6  |
| | STAT6 (green; cartoon) | -1045.5  |

**Pathway Analysis of Chlorogenic acid, DNMT1, STAT1 and STAT6**

Based on pathway analysis, the interaction between CGA and DNMT1 were not seen directly, this indicated by

a gray line. DNMT1 connected with STAT1 and STAT6 through binding with the HDAC1 protein shown by a blue line (Figure 4).

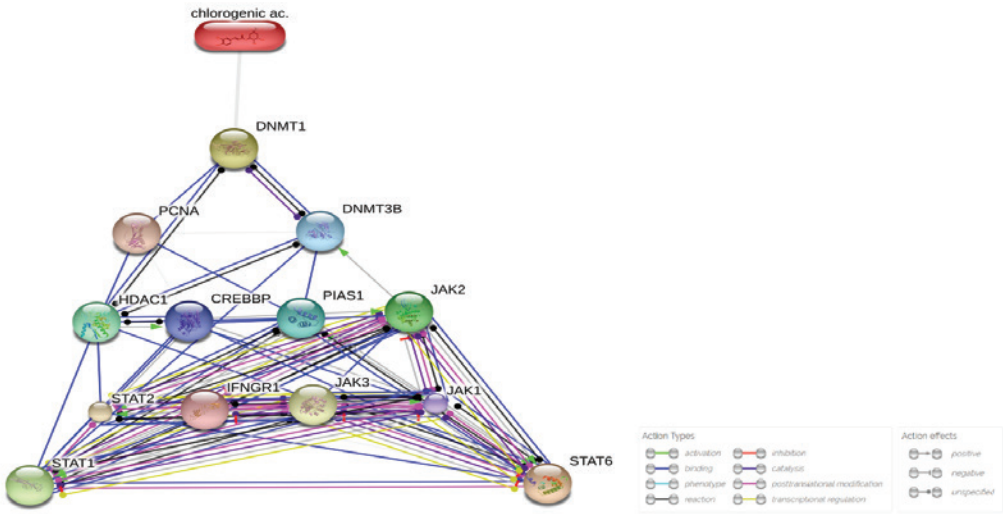



**Figure 4. Pathway prediction form between Chlorogenic acid and DNMT1**

## Discussion

Molecular docking results based on binding affinity showed that CGA had a stronger bond than 5-Aza-2'-deoxycytidine (DNMT1 inhibitor) with a score of -8.3 kcal / mol against several of the same amino acid. CGA compounds as they are known are not a classic form of treatment, but these compounds have the potential alternative pharmaceutical benefits that can exert a physiological good effect [14]. CGA phenolic compounds have a low molecular weight which has anti-tumor effect [13].

DNMT1 is DNA methyltransferase 1 and it plays a role in maintaining the composition of the methylation formulation during DNA replication [15]. The most important epigenetic activity is the ability to modulate the defense of the host immune system against microbial pathogens and it carried out through the process of DNA methylation, histone modification and non-RNA coding activities [16]. Cellular functions such as inflammatory gene expression, DNA repair and cell proliferation were regulated changes in acetylation of histone and non-histone proteins, as seen in cancer, this is associates with changes process in histone acetylation patterns [17].

Indirect NF-κB activation by 5-Aza-2'-deoxycytidine occured in upstream phosphorylation inhibition [18]. Responsive NF-κB influence cellular processes such as apoptosis, cell survival, and often directly plays a role in the control of pathogenic infections [19]. Signaling of stressed cells results in the formation of reactive oxygen intermediates (ROI) which is contribute to the activation of NF-κB [20]. Pattern recognition molecules released by physically stress of cells or metabolically will provide innate adaptive responses to threat the pathogens [21]. NF-κB is a gene target for transcription factors and the factors involved in the progression and development of inflammation [22]. NF-κB is the main regulator of innate immune response and it plays an important role in the activity of inflammatory response process in pathogens. The aim of the innate immune system is to regulate and adjust the inflammatory response to pathogens so that a balance of pathogenic destruction results and limits hyper inflammation are potential to endanger the host [23].

Mtb infection can cleare by innate immune system before the initiation of the adaptive immune response [24]. The first step of activating an innate immune response to Mtb infection is the introduction of pathogens [25]. Mtb adapts by replicating in macrophage cells and subverting cell function. This situation is able to inhibit phagosome maturation, avoid the autophagial process, or weaken the production of proinflammatory cytokines

[26]. Mtb infection induces polarization of macrophages from monocytes. Moreover, Mtb also has the potential to modulate macrophage polarization. In the first stages is tubercle granuloma formation, polarization of macrophages is M1 [27].

Transcription factors such as NF-kB are located in the cytoplasm, before further activation undergoes a transfer to the cell nucleus and as a response to influencing the signals to activate the target gene transcription, whereas the STAT protein must phosphorilation before being bound to DNA [28]. Mtb inhibited the transcription of inflammatory NF-kB and it is causes a decreasing of lysosomes enzyme into phagosomes so that there was a decreation in the ability to kill bacteria [29]. Previous studies of macrophage polarization in tuberculosis suggested that non-classical IFN-γ responses on macrophages were come from monocytes in tuberculosis patient [30]. Signal transduction and activator transcription (STAT) play an important role in cytokine production [31]. The activation of STAT1 and STAT6 are two important signals in polarization of macrophages, and it significantly pushed and suppressed in macrophage cells by influenced the CGA [13].

## Conclusion

In this research can conclude that in Silico CGA is able to influence the transfering towards polarization of M1 macrophages to modulates are more strong on innate immune system in tuberculosis infection. Experimental laboratory studies are need to prove the results.

**Ethical Clearance-**obtained from the ethics commission of Medicine Faculty, Brawijaya University.

**Conflict of Interest**-no conflict of interests regarding the publication

**Source of Funding**-the Directorate of Research and Community Service, Directorate General of Research and Development Strengthening, Ministry of Research, Technology and Higher Education (Kemenristekdikti).

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# Molecullar Docking of Epigallocatechin-3-gallate (EGCG) on Keap1-Nrf2 Complex Protein in Photoaging Prevention

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## Abstract

Photoaging is an extrinsic skin aging caused by ultraviolet radiation. It may affect patients' quality of life. Ultraviolet radiation causes increasing of Kelch-like ECH-associating protein1-nuclear factor erythoid 2-related factor 2 (Keap1-Nrf2) protein, that plays role in photoaging pathogenesis. Many substances, such as green tea catechins, have been developed in photoaging prevention. The most abundant catechin in green tea is epigallocatechin-3-gallate (EGCG). This study was an in silico study, aimed to obtain the effectiveness of EGCG through molecular docking on Keap1-Nrf2 protein. The bioinformatics tools used in this study, were Protein Data Bank (PDB), ChemDraw, Chem3D, and Molegro Virtual Docker (MVD) software. Mol Dock and ReRank score was evaluated in this study, reflected the interaction between Keap1-Nrf2 protein and compound molecules. The prediction of EGCG pharmacokinetics were performed using pkCSM On-Line Tool. The result of molecular docking between Keap1-Nrf2 protein with a candidate ligand (EGCG), a control ligand (arbutin), and a reference ligand (FB2_1615[A]) using MVD software, showed that the binding affinity of Keap1-Nrf2 protein with EGCG to be the lowest. The prediction of skin permeability of EGCG using pkCSM On-Line Tool was -2.735 cm/h and it was predicted that EGCG did not cause skin sensitization and AMES toxicity. EGCG has higher potential than arbutin and reference ligand to be an alternative agent in photoaging prevention. EGCG was predicted to have good skin absorption profile, without toxicity effect.

***Keywords:*** *photoaging, EGCG, Keap1-Nrf2, in silico, docking.*

## Introduction

Aging is a generalized impairment of function, resulting in an increasing vulnerability to environmental challenge and a growing risk of disease. Photoaging is an extrinsic skin aging, that mostly caused by ultraviolet radiation from the sun exposure. Photoaging manifests as wrinkle and dryness of the skin, and affect patient's quality of life, because skin is the outer organ seen by others.[1,2,3] Nowadays, the number of geriatric population increases. The geriatric population in Indonesia was 9.03% of all population in 2017. This fact plays role in the increasing of photoaging problems.[2,4]

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Ultraviolet radiation causes increasing of Keap1-Nrf2 protein, that plays role in photoaging pathogenesis. The number of free Nrf2 that translocates from cytoplasm to nucleus and the transcription of antioxidant response element (ARE) will decrease in photoaging.[5,6]

The effort in photoaging prevention have been developed, but the incidence of photoaging is still high. One of the biggest problems in photoaging prevention is the effectivity and the efficiency of the drugs. The new drugs that were needed, should have effective targets and easily to produce.[7,8]

Many plants, such as green tea, have been developed in photoaging prevention, but it still used multicompound approach. Green tea from tea plant *Camelia sinesis* has been planted since thousand years ago in Asia and it has been consumed by two-third of world population.

There were several studies showed the role of green tea in photoaging prevention.[7]

An in vitro study using human living skin equivalent about green tea polyphenol at 5 hours before and after ultraviolet B irradiation, showed that green tea polyphenol decreased the ultraviolet B irradiation induced apoptosis.[9] An animal study in SKH-1 hairless mice that were ultraviolet irradiated twice a week for 2 months and treated with green tea polyphenol in water orally, showed that green tea polyphenol inhibited the production of $H_2O_2$.[10] An in vivo study in SKH-1 hairless mice that were irradiated by ultraviolet B (5 times a week for 4 weeks) and were given green tea extract topically, showed that green tea extract decreased the wrinkle depth and decreased MMP-3 expression in irradiated group compared with control group.[11] A study about topical green tea extract that was topically administered on mice skin receiving ultraviolet B (UVB) irradiation, could prevent the increasing of matrix metalloproteinase-1 (MMP-1) and the decreasing of collagen number in dermal layer. The modern drug design uses single compound approach, and one of the most abundant compound in green tea is epigallocatechin-3-gallate (EGCG). EGCG is the main source of biologic activity of green tea. EGCG is the most abundant catechin in green tea.[7,12]

The drug discovery and development is a complicated process. It needs high cost in a long duration of process. Nowadays, the modern drug design was started with virtual screening (in silico study) in order to decrease the cost. The in silico study in drug design or computer aided drug design (CADD) is one of bioinformatics branch. The in silico study consists of protein structure analysis; and docking interaction between protein and the new drug. The docking interaction can predict the drug action potential in a disease prevention or treatment.[13,14] This study was aimed to predict EGCG as potential agent for photoaging prevention through in silico study by evaluating the docking interaction between EGCG and Keap1-Nrf2 protein.

## Material and Method

The molecular structure of Keap1-Nrf2 protein was downloaded from protein data bank (PDB), and PDB ID: 5FZN was selected. The structure of ligands was drawn using ChemDraw software application, version 11 and copied into Chem 3D software application, version 11 to create the 3D structure and measure the minimum energy using Molegro Virtual Docker, version 5.5.

The docking study of EGCG on the Keap1-Nrf2 protein was conducted using Molegro Virtual Docker software, version 5.0 (processor: Intel (R) Pentium (R) CPU N4200 @1.10GHz; installed RAM: 4.00 GB; system type: 64-bit-operating system). The best docking results were detected visually by comparing the structure of the docked molecules with the structure of reference ligand (FB2_1615[A]) in the binding site. (15) The MolDock and ReRank scores were presented the energy needed in receptor-ligand bond. The lowest energy visualized the best binding pose between the ligand and amino acid residue of the protein.

The prediction of pharmacokinetics and toxicity of the ligands were performed using pkCSM On-Line Tool. The molecular structure of ligands were drawn as 2D molecular structures with ChemDraw software, copied into Chem3D software, stored as a .sdf file, and translated into SMILE format using SMILE Translator Online Help. The SMILE format was processed using the pkCSM Online Tool to predict the pharmacokinetics and toxicity of compounds.(16,17,18,19)

## Findings

Target selection was obtained using the PubChem compound database. Molecular docking was performed to evaluate the mode of binding between the compound and Keap1-Nrf2 protein. The result of molecular docking 3D structure between candidate ligand (EGCG), control ligand (arbutin), and reference ligand (FB2_1615[A]) in Keap1-Nrf2 cavity showed, that the ligands were able to interact with Keap1-Nrf2 protein as the target protein (PDB ID: 5FZN) on the same binding site (Figure 1).

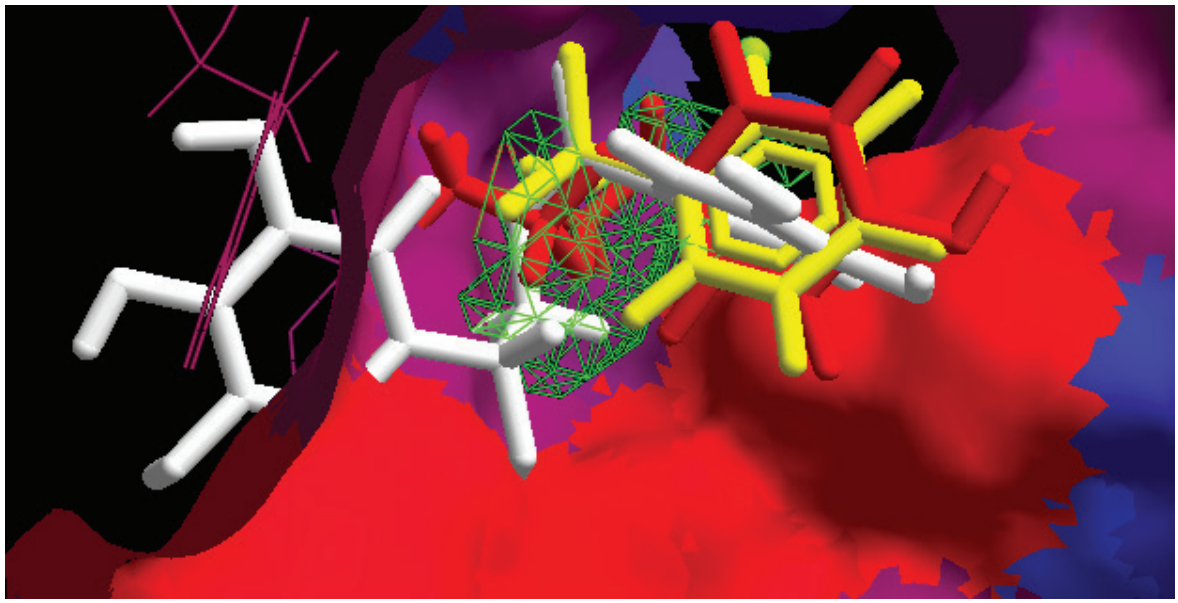

**Figure 1. The result of molecular docking 3D structure between candidate ligand (EGCG), control ligand (arbutin), and reference ligand (FB2_1615[A]) in Keap1-Nrf2 cavity. Description: green (Keap1-Nrf2 cavity), white (EGCG), red (arbutin), yellow (FB2_1615[A]).**

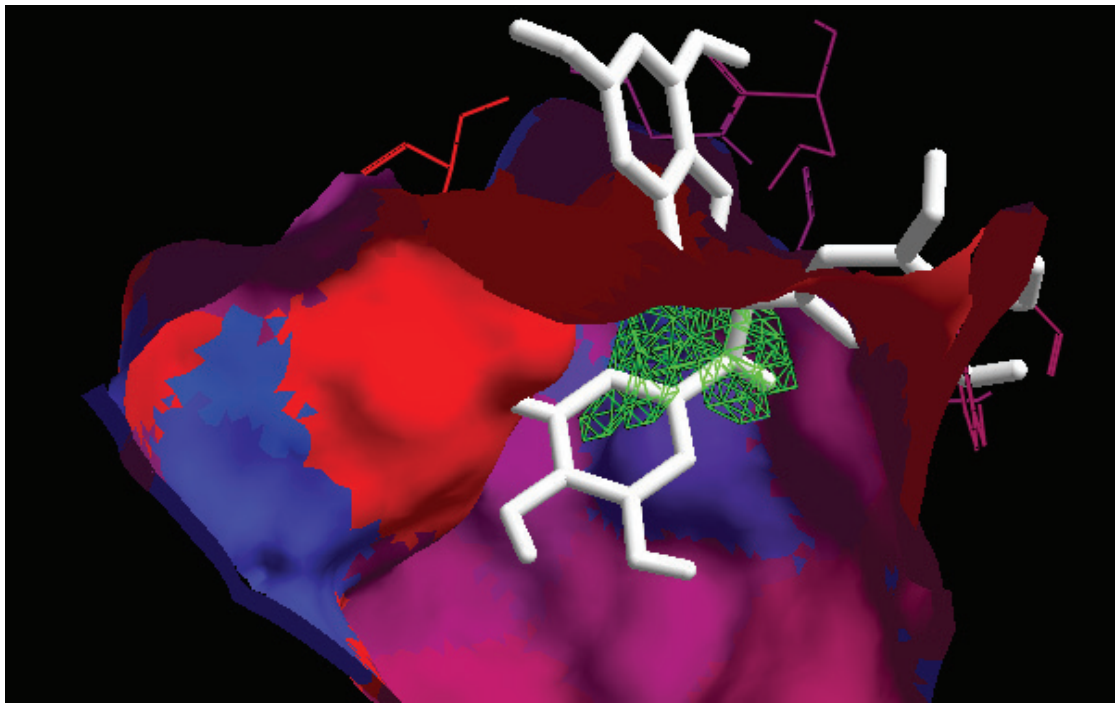

**Figure 2. Hydrophobicity view of EGCG in Keap1-Nrf2 cavity using Molegro Virtual Docker software. Description: white (EGCG); green (Keap1-Nrf2 cavity).**

The best docking position in the 3D structure molecules of EGCG to Keap1-Nrf2 protein as the target protein (PDB ID: 5FZN) can be seen in Figure 2. The docking was carried out at cavity 2, vol. 23.552. The bond location of the ligand binding site and target protein showed, that EGCG interacted with Keap1-Nrf protein through 54 number of bonds. Hydrogen and steric bond from 12 amino acids (Arg 415, Phe 335, Arg 336, Gln 337, Ser 338, Tyr 334, Asn 382, Ser 602, Gly 379, Asp 389, Arg 380, Asn 414) were showed at Figure 3.

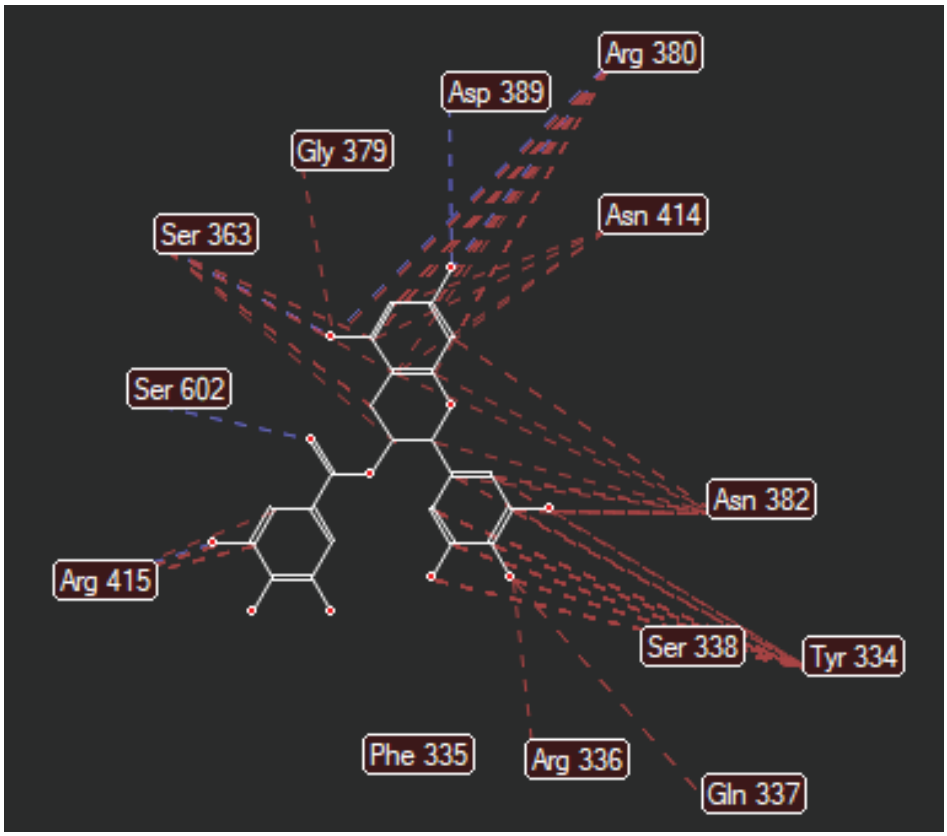


**Figure 3. Hydrogen and steric bound between EGCG and target protein (Keap1-Nrf2 protein) using Molegro Virtual Docker software. Description: blue line (hydrogen bound); red line (steric bound).**

The best docking position in the 3D structure molecules of arbutin (as the standard therapy of photoaging) to Keap1-Nrf2 protein as the target protein (PDB ID: 5FZN) can be seen in Figure 4. The docking was carried out at cavity 2, vol. 23.552. The bond location of the ligand binding site and target protein showed, that arbutin interacted with Keap1-Nrf protein through 36 number of bonds. Hydrogen and steric bond from 6 amino acids (Arg 415, Ser 363, Tyr 334, Ser 602, Gly 603, Gly 364) were showed at Figure 4.

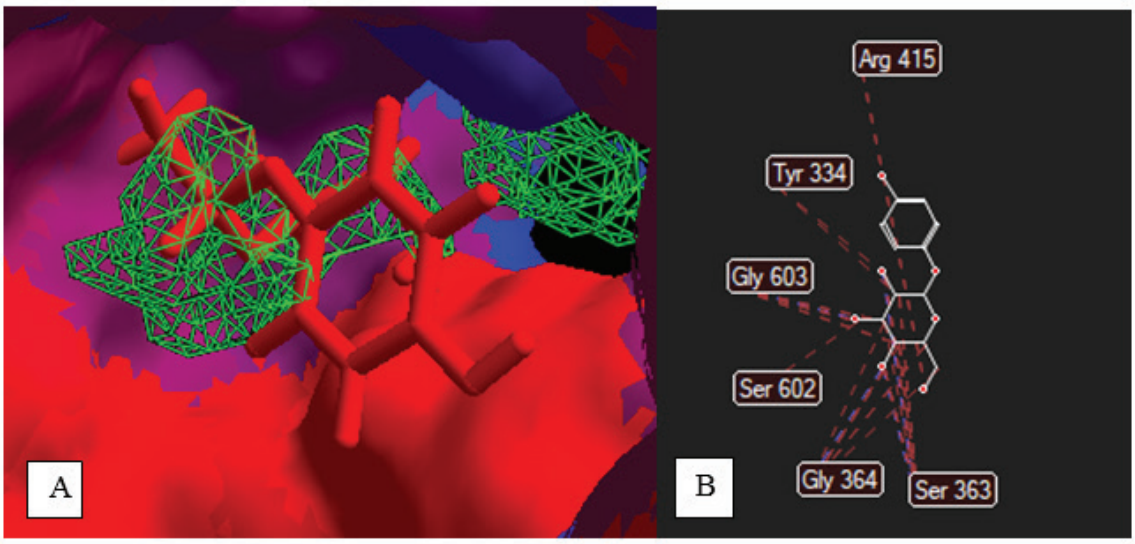


**Figure 4. A. Hydrophobicity view of arbutin in Keap1-Nrf2 cavity using Molegro Virtual Docker software. Description: red (arbutin); green (Keap1-Nrf2 cavity). B. Hydrogen and steric bound between arbutin and target protein (Keap1-Nrf2 protein) using Molegro Virtual Docker software. Description: blue line (hydrogen bound); red line (steric bound).**

The Mol Dock score and ReRank score of interaction between EGCG and 5FZN in Nrf2 cavity were shown in Table 1. The result of molecular docking between Keap1-Nrf2 protein with a candidate ligand (EGCG), a control ligand (arbutin), and a reference ligand (FB2_1615[A]) using Molegro Virtual Docker software, showed that the binding affinity of Keap1-Nrf2 protein with EGCG to be lower than that of arbutin and the reference ligand. The average Mol Dock and ReRank score of interaction between Keap1-Nrf2 protein and EGCG were -142.53±0.37 kcal/mol and -122.39±0.89 kcal/mol; between Keap1-Nrf2 protein and arbutin were -88.46±0.79 kcal/mol and -86.52±0.67 kcal/mol; and between Keap1-Nrf2 protein and FB2_1615[A] were -66.16±0.03 kcal/mol and -58.70±4.08 kcal/mol.

**Table 1. MolDock Score and ReRank Score of interaction between 5FZN protein and the compounds**

| The compounds | MolDock Score (kcal/mol) | ReRank Score (kcal/mol) |
|---|---|---|
| EGCG | -142.53±0.37 | -122.39±0.89 |
| Arbutin | -88.46±0.79 | -86.52±0.67 |
| FB2_1615[A] as reference ligand | -66.16±0.03 | -58.70±4.08 |

**Table 2. Pharmacokinetics properties of EGCG and arbutin**

| Pharmacokinetics properties | Model name | Predicted value (EGCG) | Predicted value (Arbutin) | Unit |
|---|---|---|---|---|
| Absorption | Skin Permeability | -2.735 | -2.743 | Log Kp (Numeric) |
| Toxicity | Skin Sensitization | No | No | Yes/No (Categorical) |
| | AMES toxicity | No | No | Yes/No (Categorical) |

The prediction of pharmacokinetics and toxicity were performed using pkCSM On-Line Tool. The prediction result using pkCSM On-Line Tool showed that the molecular weight value of EGCG was 458.375 (<500), and the value of the log of octanol/water partition coefficient (log P) was 2.2332. The result of pharmacokinetic prediction of EGCG can be seen in Table 2. The skin permeability of EGCG that were performed using pkCSM On-Line Tool was -2.735 cm/h. It was predicted using pkCSM On-Line Tool that EGCG did not cause skin sensitization and AMES toxicity.

## Discussion

The result of molecular docking between Keap1-Nrf2 protein with EGCG, arbutin, and a reference ligand (FB2_1615[A]) using Molegro Virtual Docker software, showed that the binding affinity of Keap1-Nrf2 protein with EGCG to be lower than that of arbutin and the reference ligand. These results showed the prediction of EGCG having higher potential in photoaging prevention than arbutin and the reference ligand.

The administration of topical formulation depends on the skin permeability. The skin permeability using pkCSM On-Line Tool was expressed as constant log Kp (cm/h). The skin permeability of EGCG was -2.735 cm/h. It was predicted, that EGCG has good skin permeability, because low skin permeability was expressed as log Kp more than -2.5 cm/h.[17,18]

Toxicity of compound can be predicted from AMES toxicity and skin sensitization. The mutagenic potential of the compounds can be predicted from the AMES

test. Mutagenic indication of compound is indicated from positive AMES test, and also indication that the compound has potential as a carcinogenic agent. The most important adverse effect from topical agent application is skin sensitization. The safety consideration of topical drug is the evaluation of whether a compound can induce allergic contact dermatitis.[17,18] The result of pkCSM On Line tool showed, that EGCG has no mutagenic and skin sensitization potential.

This study showed Keap1-Nrf2 protein as the potentially interactive target protein with EGCG. The Keap1-Nrf2 plays role in photoaging pathogenesis. Ultraviolet radiation causes increasing of Keap1-Nrf2 complex, that plays role in photoaging pathogenesis.[5,6] It was predicted in this in silico study, that binding of EGCG to Keap1-Nrf2 protein would be able to prevent photoaging. The prediction of pharmacokinetics and toxicity using pkCSM On Line tool showed that EGCG has good absorption profile without toxicity effect.

## Conclusion

This in silico study showed, that EGCG has potential in photoaging prevention, by interacting with Keap1-Nrf2 protein (PDB ID: 5FZN). The binding affinity of EGCG to Keap1-Nrf2 protein was lower than that of arbutin and reference ligand (FB2_1615[A]), it showed that EGCG has higher potential to be an alternative agent in photoaging prevention, with good phamacokinetics profile.

**Conflict of Interest:** No conflict of interest regarding the publication.

**Source of Funding:** This research was financially supported by Directorate of Research and Community Service - Directorate General of Research and Development - Ministry of Research, Technology and Higher Education (Direktorat Riset dan Pengabdian Masyarakat - Direktorat Jenderal Riset dan Pengembangan - Kementerian Riset, Teknologi dan Pendidikan Tinggi/Kemenristekdikti).

**Ethical Clearance**: taken from Ethical Committee in Faculty of Veterinary Medicine, Airlangga University, Surabaya, Indonesia.

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# The Effect of Buzz Group Modification Method on Exclusive Breastfeeding Against Self Efficacy in Pregnant Women: A Quasi Experiment

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## Abstract

**Background:** Exclusive breastfeeding for six months is an effort to increase the breastfeeding benefits and reduce infant mortality rate. Self efficacy is one of the factors that can influence the level of confidence exclusive in breastfeeding.

**Aim:** This study aimed to identify the level of self efficacy before and after given modified buzz group method and to the influence of modified buzz group method about exclusive breastfeeding against self efficacy in pregnant mother

**Method:** This study was designed using quasi-experimental design. The study was conducted in the working area of the health center. The total population used in this study was 42 pregnant women. A total sample of 38 respondents was taken according to purposive sampling. BSES-SF (Breastfeeding Self Efficacy Scale Short Form) questionnaire was administered at pre-test and post-test. Data analysis was performed using the Wilcoxon Signed Rank test and the Mann Whitney test.

**Results:** The results showed that the Wilcoxon Signed Rank statistical test obtained p value of 0,000 in the treatment group and p value of 0.355 in the control group. The Mann Whitney statistical test obtained a significant value of p = 0,000 at the post-test. The modification of the buzz group method took effect to increased self efficacy about exclusive breastfeeding for pregnant mother because this method was organized by four sources of self efficacy that was direct experience, indirect experience, verbal persuasion, and emotional condition.

**Conclusion:** With the modification of the buzz group method and self efficacy for pregnant mother can increase of value for breastfeeding exclusive coverage.

***Keywords:*** *Buzz Group Modification, Buzz Group Method, Self-Efficacy, Breastfeeding Self-Efficacy*

## Introduction

Breast milk can help infants to start life well, the content in breast milk can meet all food needs such as nutrition and immunology. Giving exclusive breastfeeding for 6 months and continued with breastfeeding for 2 years can enhance spiritual (SQ) and emotional (EQ) abilities[1]. Problems that cause mothers not to exclusively breastfeed are lack of knowledge about the breastfeeding benefits, proper breastfeeding, lack of lactation counseling services and support from health workers, socio-cultural perceptions against breastfeeding, and lack of motivation to breastfeed. Psychological factors are one of the factors that influence one's level of confidence. Self efficacy is a person's belief to do a specific task or behavior[2].

Self-efficacy or self-confidence is one important factor in the success of giving exclusive breastfeeding. There was study examined that the lower the self-efficacy of a person, the lower the success rate. Until now there are still mothers who are worried that the production of breast milk is a little, thus, the reality that occurs mothers really experience disruptions in the production

of breastfeeding[3,4]. Many ways have been done by the government to socialize exclusive breastfeeding, namely the formation of government regulation number 33 of 2012 concerning exclusive breastfeeding and various kinds of study on exclusive breastfeeding have been done, but until now Indonesia has not been able to achieve the target that was set by the government in 2010, namely coverage exclusive breastfeeding for infants aged 0-6 months is around 80%. This can be seen from the results of a health service survey in 2015, the coverage of exclusive breastfeeding in Indonesia from 0-6 months of infants was 55.7% with an increase of 3.4% from the previous year which was 52.3%[5,6]. Self-efficacy for breastfeeding is an action that cannot be separated by the mother's belief in giving breastfeeding to her infant. There are various factors that make up self-efficacy such as direct experience, the experience of others, verbal persuasion, physical, and emotional state[7].

Pucang Sewu Public Health Center is one of the public health centers in the Surabaya city area of Indonesia that has low breastfeeding coverage rates. Pucang Sewu public health center has a class of pregnant women which is held once a month. The number of pregnant women in attendance is not proportional to the number of pregnant women recorded in the public health center. This happens because of many factors, one of which is the absence of a companion during a class of pregnant women, the lack of motivation of mothers to come, and less varied learning methods. The use of the buzz group method is a considered as appropriate way to eliminate these factors because this method has never been used during a class of pregnant women and considered as an update way of teaching material. The results of the study mentioned the role of the buzz group method in an effort to improve learning outcomes in fiqih material can be stated sufficient or moderate. Other study results revealed that there was an influence of the buzz group discussion method with the uno card game on student collaboration and the ability to solve student problems.

Based on this background the writers intended to provide a buzz group method modification in the class of pregnant women aimed at increasing the self-efficacy of pregnant women related to exclusive breastfeeding, hence it is expected that after giving birth mothers will exclusively give breast milk.

## Method

This study used a quasi-experimental design. The independent variable in this study was the buzz group on the dependent variable, namely the self-efficacy of pregnant women in exclusive breastfeeding. Buzz group was a large group which was divided into several small groups, consisting of 4-5 people. An impromptu group consisting of no more than five people will make all group members actively involved in the discussion. The place was arranged so that participants can have their faces covered and exchange ideas easily. Buzz groups also assigned each large group member and group leader. The next stage, small groups gathered and discussed, then returned to the large group, which then conveyed ideas that arise in the group. At the end of the session, the facilitator asked each group to actively participate in delivering the results of the discussion. This method can build an atmosphere of mutual respect for differences of opinion and also increase the participation of participants who still did not talk much in broader discussions and can develop a common opinion or agreement to find a best formulation of an issue.

The population in this study was pregnant women in the working area of the Pucang Sewu Public Health Center. The population in this study was 42 pregnant women. Based on the formula, the minimum sample size used was 38 respondents. The 38 sample results were divided into 2 groups: 19 for the control group and 19 for the experimental group, with inclusion criteria: (1) Mothers can read, write and hear (2) Late trimester pregnant women recorded in the Pucang Sewu Puskesmas. Furthermore, the exclusion criteria are: (1) Pregnant women with chronic or infectious diseases (HIV, TB, cancer, hepatitis). (2) Pregnant women who did not have permanent residences.

The sampling used by writers was nonprobability sampling that was purposive sampling. Data collection instruments used in this study were in the form of informed consent, questionnaire sheets, stationery, booklets and turning sheets about exclusive breastfeeding, and respondents. The instrument in this study used the Breastfeeding Self Efficacy Scale Short Form (BSES-SF) containing 14 questions about confidence and confidence in breastfeeding. Each question has a 5-point Likert scale and summed. This instrument was compiled

by Dennis in 2003 and has been declared valid and reliable[8].

The data collected was analyzed the differences in self-efficacy changes before and after the intervention was given, such as buzz group method modification with the Wilcoxon Signed Rank Test. The Mann Whitney test was carried out to analyze the differences between the two groups, the treatment group and the control group, with significance level $p \leq 0.05$ meaning that if the statistical test showed the value of $p \leq$ then H1 is accepted. This study has been through a review and has been declared "Eligible Ethics" with a Certificate of Ethical Feasibility from the Faculty of Nursing, Universitas Airlangga, Surabaya Indonesia.

## Results

### Characteristics of Respondents

The following is the respondent's characteristic data.

**Table 1: Characteristics of Respondents**

| **Control Group** | | | **Treatment Group** | |
|---|---|---|---|---|
| | **F** | **%** | **f** | **%** |
| Age | | | | |
| 20-30 | 15 | 78,9 | 9 | 47,4 |
| 31-40 | 4 | 21,1 | 9 | 47,4 |
| >40 years old | 0 | 0 | 1 | 5,3 |
| Last Education | | | | |
| Elementary School | 2 | 10,5 | 5 | 26,3 |
| JHS | 7 | 36,8 | 5 | 26,3 |
| SHS | 6 | 31,6 | 9 | 47,4 |
| Fresh graduate | 4 | 21,1 | 0 | 0 |
| Pregnant | | | | |
| 1st | 8 | 42,1 | 2 | 10,5 |
| 2nd | 7 | 36,8 | 9 | 47,4 |
| 3rd | 3 | 15,8 | 5 | 26,3 |
| 4th | 1 | 5,3 | 1 | 5,3 |
| 5th | 0 | 0 | 2 | 10,5 |
| Work | | | | |
| House maid | 14 | 73,7 | 13 | 68,4 |
| Staff | 3 | 15,8 | 6 | 31,6 |
| Public servant | 2 | 10,5 | 0 | 0 |

Self Efficacy

Herewith the result of self-efficacy in the treatment and control group

**Table 2 : Self efficacy before and after given buzz group method modification**

| Self efficacy | Control Group | | | | Treatment Group | | | |
|---|---|---|---|---|---|---|---|---|
| | Pre-test | | Post-test | | Pre-test<br>Post-test | | | |
| | f | % | f | % | f | % | F | % |
| High | 3 | 15,8 | 5 | 26,3 | 3 | 15,8 | 18 | 94,7 |
| Medium | 13 | 68,4 | 14 | 73,7 | 15 | 78,9 | 1 | 5,3 |
| Low | 3 | 15,8 | 0 | 0 | 1 | 5,3 | 0 | 0 |
| Total | 19 | 100 | 19 | 100 | 19 | 100 | 19 | 100 |

**The Effect of *buzz group* method modification of exclusive breastfeeding against *self efficacy* in pregnant women**

Herewith the result of the differences between self-efficacy of exclusive breastfeeding before and after given the intervention such as buzz group method modification

**Table 3 : The Effect of *buzz group* method modification of exclusive breastfeeding against *self efficacy* in pregnant women**

| No. | Self efficacy | | | | | |
|---|---|---|---|---|---|---|
| | Control Group | | | Treatment Group | | |
| | Pre-Test | Post-Test | Deviation | Pre-Test | Post-Test | Deviation |
| 1. | 51 | 49 | 2 | 46 | 53 | 7 |
| 2. | 50 | 48 | 2 | 43 | 54 | 11 |
| 3. | 49 | 50 | 1 | 44 | 53 | 9 |
| 4. | 47 | 48 | 1 | 40 | 55 | 15 |
| 5. | 39 | 41 | 2 | 51 | 58 | 7 |
| 6. | 38 | 40 | 2 | 44 | 51 | 7 |
| 7. | 38 | 38 | 0 | 51 | 51 | 0 |
| 8. | 39 | 39 | 0 | 45 | 54 | 9 |
| 9. | 44 | 44 | 0 | 39 | 52 | 13 |
| 10 | 35 | 37 | 2 | 43 | 47 | 4 |
| 11. | 36 | 43 | 7 | 44 | 55 | 11 |
| 12. | 46 | 40 | 6 | 45 | 55 | 10 |
| 13. | 46 | 44 | 2 | 39 | 53 | 14 |
| 14. | 47 | 48 | 1 | 38 | 54 | 16 |
| 15. | 39 | 39 | 0 | 48 | 53 | 5 |
| 16. | 40 | 41 | 1 | 36 | 60 | 24 |
| 17. | 41 | 42 | 1 | 44 | 52 | 8 |
| 18. | 35 | 37 | 2 | 46 | 54 | 8 |
| 19. | 40 | 41 | 1 | 40 | 50 | 10 |
| Average Score | 42.11 | 42.58 | 1,74 | 43,47 | 53,37 | 9,89 |
| Wilcoxon | p = 0,355 | | | p = 0,000 | | |
| Mann Whitney Pre-Test | p = 0,412 | | | | | |
| Mann Whitney Post-Test | p = 0,000 | | | | | |
| Mann Whitney Selisih | p = 0,000 | | | | | |

## Discussion

The results examined that self-efficacy of the control group and the treatment group before getting the intervention got the same score that was moderate. Self-efficacy was a person's belief to do positive things, thus it affected motivation, thought processes, emotional conditions, and social environment that shows a habit. Self-efficacy for mothers was considered as important for breastfeeding activities and can provide an illustration, especially for health workers about mothers' readiness in providing nutrition with breast milk for their babies. The level of self-efficacy of a person in each task varies greatly. This arises due to factors that influence the perception of an individual's abilities such as gender, age, level of education and experience[9].

Based on the results of the study, respondents with primary education have low to moderate self-efficacy, such as control group respondents number 10 who have low self-efficacy because mothers cannot read fluently and also lack of knowledge about breastfeeding. Control group respondent no. 1 and 2 were respondents with a high education level, namely tertiary institutions with high self-efficacy scores, this was due to the large amount of information that mothers have obtained from various books and internet sources. Individuals who have higher levels have higher self-efficacy, because basically they learnt more and receive more formal education, besides individuals who have higher education levels will get more opportunities to learn in overcoming problems[10].

The number of children was one thing that influenced the practice of breastfeeding. Most respondents were mothers with more than one child. This will increase the experience of mothers in breastfeeding. The number of children influenced the mother's knowledge because the practice of nursing mothers was closely related to the learning process of the practice of the previous child. The results revealed that self-efficacy after intervention in the treatment and control groups were different. These results were reinforced by the post-test conducted 1 week after the intervention. This referred to a theory that explained that the effective time to carry out a post-test should be within a week after the intervention. The treatment group, which initially had an average level of self-efficacy after being intervened, became a high average, in contrast to the control group which had no significant changes after the intervention[4,11].

The experience of success or direct experience can increase the confidence and strong desire of the respondent. A sense of success can also increase the persistence and persistence of respondents during the process, so as to reduce failure. Mothers who have direct breastfeeding experience tend to be more confident to continue breastfeeding. There were 6 respondents who gave non-exclusive breastfeeding to their children, and the six respondents had a moderate level of self-efficacy. There were 3 respondents who had successfully provided exclusive breastfeeding and the three people had high self-efficacy. The learning pyramid theory Edgar Dale explains that a person's learning outcomes were obtained by direct experience (concrete). Learning that referred to Edgar Dale's pyramid theory reinforced direct experience, through direct experience practice will provide information and ideas contained in that experience, because it involved the sense of sight, hearing, feeling, smell, and touch[8].

Someone's self-efficacy can increase especially if she believes she can do the action because she sees that other people have succeeded in doing so. Individuals will have a tendency to increase motivation and confidence to take action if they see that those who have already been able to succeed through the problem. Small groups when implementing the buzz group modification get problems that were discussed in groups, this allowed for mothers who have experience in giving breastfeeding to tell the inexperienced, thus it can bring self-efficacy to inexperienced mothers[3,12].

Buzz group modification activities can encourage shy individuals to contribute thoughts to participate in discussions and create a pleasant atmosphere so that pregnant women can receive information with happy feelings[12,13]. Respondents from the treatment group got an increase with high self-efficacy values, there was only 1 respondent did not experience it. This was because respondent number 10 was in a hurry to go home soon because her first child was sick. In terms of age, the respondent was 34 years old enough, in terms of the experience of the respondent she also has 2 children and now his third pregnancy, the first child was not exclusively breastfed because of work and the second child was exclusively breastfed, in terms of education.

The control group did not experience a significant increase in self efficacy about exclusive breastfeeding. The increase in self efficacy about exclusive breastfeeding in the control group only slightly increased, it happened because after the pre-test the control group followed the class of pregnant women who also coincided with discussing the material of breast milk, namely understanding breastfeeding, understanding exclusive breastfeeding, and how to express milk. The activity was one form of verbal persuasion, where verbal persuasion was one source of self-efficacy. Another factor that made the increase in the control group was that the writers gave a handbook on pregnancy to respondents as souvenirs during the pre-test and every Monday and Thursday there was an examination of pregnant women, meaning that there were pregnant women who received additional information when attending examination. Therefore, after a post-test one week later there was still a shadow about breast milk making a slight increase in the control group.

## Conclusion

Submitting material with a modification of the buzz group method was a powerful way to increase self-efficacy about exclusive breastfeeding to pregnant women, because at home pregnant women can re-study the material discussed.

**Source of Funding:** This research was fund by author

**Conflict of Interest:** There is no conflict of interest

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# Tobacco Smoke and Pregnancy Outcome: Literature Review

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## Abstract

**Introduction**. Pregnant women have a risk for tobacco smoke both actively and passively. Pregnant women are usually exposed to enviromental tobacco smoke (ETS) in various places with different duration of time. Cigarette smoke has a severe effect not only on pregnant women but also on the fetus.**Methods** This is a literature review. Various references were collected from online database including reports, journals, mostly in the last 10 years. The journals were mostly from the scholarly journals.

**Results**. Tobacco smoke can effect the immunity, hormonal and metabolic system of the pregnant woman, therefore disturbing the growth of the fetus. Tobacco smoke also known to increase the risk of premature birth and reduce gestational age. Tobacco smoke cause several problems in newborn such as respiration distress, low birth weight (LBW), neural disorder, sudden infant death syndrome (SIDS) and congenital anomaly.

**Conclusion**. The effect of tobacco smoke, actively of passively, have worse outcome for the pregnant women and their babies.

***Keyword**: Pregnancy Outcome, tobacco smoke, ETS, LBW, preterm birth.*

## Introduction

Smoking pregnant women have an increased risk of having an ectopic pregnancy, spontaneous abortion and other complications leading to pregnancy complications as well as the placenta. The fetus also has the risk of exposure to tobacco smoke, more than thousands of types of hazardous chemicals, especially nicotine, tar and carbon monoxide can have an effect on the fetus and cause unwanted disorders or abnormalities[1].

Environmental tobacco smoke (ETS) is a complex mixture consisting of most of the smoke emitted from the smoker's body, the smoke produced by burning cigarettes and the surrounding air[2]. Exposure of ETS in pregnant women causes increased levels of carbon monoxyde (CO), nicotine and cotinin in maternal serum or urine, in the fetus and in amniotic fluid. The effect of ETS on pregnant women can occur from the first semester to the third semester. Pregnant women are usually exposed to ETS in various places with different duration of time. Places that have the potential to become ETS exposure locations include at home, at work and the outside environment[3].

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### Tobacco smoke and pregnancy

One effect of the cigarette smoke exposure on pregnant women is its effect on the mother's immune system. In pregnancy changes occur in the mother's immune system to prevent rejection of the fetus. Exposure to ETS can cause changes in the immune system of pregnant women. Changes include an increase in activated leukocytes and a decrease in the percentage of regulator T lymphocyte cells (Treg cells). Smoking

during pregnancy also affects the function balance between Th1 cells (T helper lymphocytes) and Th2 cells, causing an increase in the production of cytokines, proinflammatory chemokines and Th1 growth factors. In addition, the percentage of macrophages and NK cell residues is higher in smokers in the first semester (4)

The activation of nicotine receptors causes the release of acetylcholine, dopamine, serotonin, growth hormones and adrenocorticotropic hormones and glutamate, these hormones significantly influence fetal growth. Smoking is also associated with changes in metabolism during pregnancy.[4]

Exposure to nicotine in pregnant women can cause vascular placental vasoconstriction, decrease placental blood flow and reduce trophoblast invasion which results in inhibition of good placental circularization leading to placental hypoxia causes disruption of placental invasion. Placenta previa is a form of placental invasion disorder[4]. Nicotine can cause a significant decrease in the mitotic potential of cytotrophoblast tissue in vitro. This effect is also found in smoker women. This effect can explain the mechanism of impaired placental development during the early phases of pregnancy due to placental ischemia which can cause fetal death[5]. Low placental weight strongly related with LBW[6].

Beside nicotine and cotinin, CO levels are also the found highest in smokers. The presence of CO in the body causes oxygen binding to hemoglobin decrease due to the higher affinity of hemoglobin for CO. CO Exposure to the fetus prevents the release of oxygen and then converted to carboxyhemoglobin. The result is a decrease in tissue oxygenation through competitive inhibition with oxyhemoglobin. Prolonged CO exposure in pregnant women can cause significant permanent damage to the brain of a fetus which sensitive to hypoxia. Nicotine is also considered to have a bad effect due to the stimulation of nicotine cholinergic receptors and their neuroteratogenicity effects.[4,7,8] Nicotine also interferes with the micro RNA which is important for the maturation of fetal stem cells.[9]

The effects of tobacco smok on the fetus are considered to be multifactorial, including indirect effects such as poor nutritional status associated with anorexiagenic effects of nicotine exposure, and CO. Placental blood flow decrease is associated with the vasoconstrictive effect of catecholamines released from adrenals and nerve cells after nicotine exposure.[10]

**Tobacco Smoke and Preterm Birth**

In Europe rates of preterm births are reported between 5 - 9%, while in developing countries and the United States the rate of preterm births reaches 12%. The cause of preterm birth is often difficult to determine. Some risk factors associated with preterm birth include excessive distension of the uterus, low economic status and smoking[11]. Elective preterm birth may be associated with cigarette-related obstetric complications such as placenta previa, placental abruption and impaired fetal growth. Research shows that smoking during pregnancy increases the risk of preterm birth by 25%. The exposure of ETS also specifically has an influence on preterm birth[12,13].

Active smoker mothers have been accepted as a risk for preterm birth, for around 14% of preterm births. One mechanism that links cigarette exposure with preterm birth is the CYP1A1 genotype and GST (glutathione S-transferase). Abnormalities in these genes make mothers more vulnerable to exposure to hazardous substances such as cigarette smoke.[14] Cotinin levels as an indicator of cigarette exposure are also strongly related to preterm birth[4] The danger of non-smoking tobacco is also seen in the research of Munmun et al. Which shows that non-smoking tobacco (chewed and swallowed) increases the risk of preterm birth.[15]

There are four mechanisms proposed by Goldstein et al explain relationship between smoking and preterm birth: (a) Decreased maternal appetite caused by smoking leading to a decrease in nutrition for the fetus, (b) vasoconstriction caused by smoking results in decreased blood supply to the fetus, reduced fetal nutritional supply and slowing the release of catabolism results, (c) cigarettes may have a direct effect of toxins on the fetus and (d) increase in fetal CO levels causes reduced oxygen transport capacity and teratogenic properties.[11,16]

Prostagladin has been known to trigger labor. Prostaglandin levels such as F2-isoprostane as a marker of oxidative stress are found in the amniotic membrane and amniotic fluid in smokers. F2-isoprostane levels increased 3 times compared to non-smokers. Increased

F2-isoprostane levels is considered as a mechanism that associated smoking and preterm birth. Smoking is also considered to increase the sensitivity of the uterus to contractile hormone. Research by Egawa et al in mice shows that inhalation of cigarette smoke increases the contractile activity and sensitivity of myometrium to oxytosis.[11,17] Cadmium found in tobacco smoke interacts with calcium and effects myometrial activity. Cadmium may modulate the function of the oxytocin receptors in the myometrium. Increased levels of cadmium in pregnant women are found to be associated with an increased risk of preterm birth.[11,18] Another condition associated with preterm birth is necrotizing-enterocolitis (NEC)[19]

**Spontanious Abortion**

Spontaneous abortion or miscarriage is one of the most common pregnancy complications, about 12-26% of known pregnancies. Generally the literature on the relationship between smoking and abortion does not show any consistency although some studies have concluded that smoking can cause abortion. A meta-analysis study by Pineles et al. Showed the relative risk of abortion during pregnancy is 1.32. The risk of abortion increases with the number of cigarettes. One cigarette per day increases the risk of abortion by 1%. Secondary smokers have an 11% increased risk of abortion.[20]

**Tobacco Smoke Effect on Newborn**

Various studies provide an overview of the effects of cigarette smoke on fetal growth and development during pregnancy and infant growth and development after birth

**Respiratory Disorder**

Smoking during pregnancy can cause the newborn's lungs failed to reach maximum function and continues with decreased lung function. Preterm births in most smokers also cause disruption of lung maturation. Diseases caused by these infants include wheezing, bronchitis, hospitalization due to lung infections and asthma in children.[21]

Generally, children who are exposed to nicotine during pregnancy also experience exposure to cigarette smoke in childhood. This raises the question whether the increased risk of asthma is caused by exposure to prenatal or post natal cigarette smoke. Research by Pattenden et al showed that exposure to cigarette smoke during pregnancy without post natal exposure still shows an association with an increased risk of asthma.[22,23] Exposure to cigarette smoke pre natal and post natal also shows an imbalance of Th1/Th2 causes susceptibility of airway reactivation.[24]

The mechanism of exposure to nicotine causes various pathological conditions in the lungs is not yet fully understood, but based on some data it was found that nicotine causes various anomalies in the lungs. Histological studies in animals show goblet cell hypertrophy after nicotine exposure, and it is associated with asthma in the community.[22,25,26]

***Low Birth Weight***

Low birth weight babies are the variables most widely studied the effect of smoking mothers during pregnancy or exposure to cigarette smoke in pregnant women on pregnancy outcomes. Data shows that LBW is more common in smokers (12.4%) compared to nonsmokers (7.7%). Women who smoke have a 1.5 to 3.5 times greater risk of giving birth to LBW, and the risk increases along with the cigarette consumption.[1]

Lee et al study showed that exposure to ETS in pregnant women also has the potential to cause LBW, and the effect of smoking on LBW from active smokers has the same mechanism as the effect of smoking on LBW in secondary smokers. The risk of small infants according to pregnancy is also increased in the group of mothers with high ETS exposure compared with mothers with low ETS exposure[27]

**Behaviour and Neural Disorder**

Nicotine exposure to the fetus can affect fetal brain development[10]. A study in Finland shows that heavy nicotine exposure caused the infant born with attention deficit / hyperactivity disorder (AHDH) or attention deficit / hyperactive disorders.[28] Fetuses exposed to tobacco smoke during pregnancy ware found to have a risk of cardiac autonomic abnormalities during sleep especially in preterm babies. Changes in autonomic activity are at risk of causing neurological and cardiological complications[29].

Sudden infant death syndrome (SIDS)

One of the most severe complications of nicotine exposure in pregnancy is sudden infant death syndrome or SIDS. The cause of SIDS is not clearly known in infants less than one year old suddenly die without definite explanation even after a thorough investigation. Exposure to nicotine is known to be a risk factor for SIDS, but the mechanism of nicotine exposure that causes infant death is unclear and is still being debated. But some animal studies provide some clues.[22,30,31]

**Congenital Anomaly**

The effects of tobacco smoke on infanst congenital anomalies have been investigated. Exposure to tobacco smoke is known to be associated with fetal heart defects including atrial septal defects, atrioventricular septal defects, transposition of large arteries, craniosynostotic cleft palate and gastroschisis.[4,33.]

## Conclusion

Tobacco smoke effect the immunity, hormonal and metabolic system in pregnant women. The substance found in tobacco smoke were found to be the cause of some pregnancy complication leading to poor pregnancy outcome such as preterm birth, spontaneous abortion, and adverse effect on tha infants. The infants could suffer respiratory disorder, behavior and neural disorder, SIDS and another congenital anomaly.The effect of tobacco smoke, actively of passively, associated with poor outcome for the pregnant women and their babies.

**Ethical Clearance**- Taken from University ethical committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

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# Identifying and Revealing Active Compound from Green Tea (*Camellia sinensis*) for Curing Systemic Lupus Erythematosus by Acting as CASPASE 1 Inhibitor

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## Abstract

This research aimed to reveal the potency of green tea (*Camellia sinensis*) as immunomodulator, anti-apoptosis agent and anti pyroptosis agent in Systemic Lupus Erythematosus.. The rest samples was downloaded from KNAPSACK Database. Biological activity prediction was conducted by PASS SERVER. Molecular Docking analysis was performed by Autodock Vina in PyRx software v.0.9.3. Complex docking was analyzed and visualized using Discovery Studio Software. The result showed that Camellia sinensis has the main potency as immunomodulatory, antioxidant and anti-inflammation. The highest activity of this herbal is antioxidant. There are few bioactive that have role as immunomodulator. The result of molecular docking can explain the mechanism of active compound as anti-apoptosis and anti-pyroptosis. Docking result showed that Theaflavin has the highest affinity to both activities. It can be concluded that bioactive from *Camelia sinensis* is promising for curing Systemic Lupus Erythematosus by acting as antioxidant and inhibit apoptosis and pyroptosis mechanism.

***Keywords**: Camellia sinensis, anti-apoptosis, pyroptosis, Systemic Lupus Erythematosus*

## Introduction

Systemic Lupus Erythematosus (SLE) is a chronic inflammatory of autoimmune disease where the immune system was mistakenly attacks healthy body cells. The production of autoantibodies damage many organs including the joints, skin, kidneys and nervous system [(1)]. This disease occurs nine times more among women than men. The cause of SLE is unknown, but some occur due to genetic susceptibility [(2)] and environmental factors [(3)] have been showed to be involved in its pathogenesis.

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SLE was associated with impaired apoptotic cleansing. While initial triggers were varieties, excessive accumulation of apoptotic debris, especially microparticles containing nuclear material, activate antigen presenting cells including dendritic cells and B cells, which initiate cellular interactions that lead to the generation of antinuclear antibodies through interactions with autoreactive T cells [(4)]. T cells not only activate B-cell responses but also infiltrate te target tissue and cause type I and type II interferon (IFN I/II) damage, tumor necrosis factors (TNF), B-lymphocyte stimulators (BLys), interleukin 6, interleukin 17, interleukin 18, interleukin 21 and many other cytokines involved in autoimmune priming and inducing inflammation-mediated tissue injury in patients with SLE [(1)].

Apoptosis in the model of SLE, the nuclear material driving autoreactivity translates to the extracellular space as a consequence of cell death. In this case

apoptosis as a source of selfantigen in lupus. Another cell death that underlies the pathogenesis of SLE is pyroptosis. Pyroptosis release of nuclear and cellular autoantigens, release of inflammatory cytokines (IL-1b, IL-18) and release of danger molecules (HMGB1, ATP) thus triggering inflammation and inducing autoimmune [(5)]. Caspase activation by the apoptotic pathway results in activation of effector caspase (caspase-3) whereas caspase-1 can cause piroptosis, a form of programmed cell death accompanied by cell lysis [(6)].

New agents being developed by specifically target the intracellular signaling pathway, inflammatory cytokines, chemokines, surface costimulation molecules, and proteasomes as new drug options in the treatment of SLE. Nowdays, belimumab (anti-BLyS) is the only biologic drug approved by the FDA to treat SLE. Drugs representing various therapeutic strategies are moving into phase III clinical trials [(7)]. New agents with potential as SLE treatment are needed to support the development of SLE therapy.

Another natural therapy as an alternative treatment and prevention of SLE complications is use tea. Camellia sinensis tea is classified according to processing used into four different subtypes: green tea, black tea, white tea and oolong tea. Green tea is a product without fermentation process and thus the oxidation of polyphenol components can be prevented. White tea is a product by using minimal fermentation of new shoots and young leaves are harvested only once a year in early spring [(8)]. The making of black tea carried out by fermentation ensures a high level of oxidation of enzymatic catalyzed polyphenols followed by a series of chemical condensation [(8-9)].

Green tea is beneficial for health such as cancer prevention, obesity, diabetes and neurodegenerative diseases. And some studies showed that the benefits of Green tea for autoimmune diseases such as SLE. All studies proved that the effect of EGCG on autoimmune pathogens such as EGCG preventing and reversing defects in autoimmune encephalomyelitis by inhibiting T cell proliferation by suppressing CDK4 and regulating I kB-α and directly inhibiting nerve cell death by impairing ROS formation [(10)]. Inhibits autoimmune arthritis by Inhibition of STAT3 and HIF-1a with Th17 / Treg [(11)]. Repairing autoimmune encephalomyelitis by changing the balance between CD4 T cell subsets by activating MAPKs and NF-κB signaling pathways [(12)].

Camelia sinensis tea has many active compounds that have potential as anti-inflammatory, antioxidant and immunomodulatory agents. For this reason, this research explored the potential of tea and green tea (camellia sinensis) as an immunomodulatory, anti-inflammatory, antioxidant and anti-apoptotic and antipyroptosis agent as agents for SLE worship. This research will evaluate using computational process in the early step. Computational analysis or in-silico can reveal the potential of herbal before testing in the laboratory. This technique could explain the mechanism of action by conducting the molecular docking process. *Camellia sisnesis* was used for treatment in rheumatoid including Systemic Lupus Erythematosus. Camellia sinensis has EGCG bioactive that popular for responsible in many mechanism

## Method

### Retrieval Data from Database

Bioactive compounds from *Camellia sinensis* were collected from KNAPSACK (http://kanaya.naist.jp/KNApSAcK/ ). The SMILE format and 3D structure of *Camellia sinensis* of Bioactive was downloaded from PubChem (www.pubchem.ncbi.nlm.nih.gov) (Supplementary Data 1). Moreover, the 3D structure of Caspase 1 and Caspase 3were downloaded from Protein Data Bank (PDB) (www.rcsb.org/pdb/home.home.do). The 3D structure was provided for molecular docking process

### Analysis of Biological Activity

The active compounds of *Camellia sinensis* were analyzed using PASS online server to determine the biological activity. It depended on the compound structure. The analysis will be resulting Pa (Probability of active) and Pi (Probability of inactive) score with range from 0 to 1. If Pa > Pi mean it is potential for specific therapeutic candidate [(13)].

### Molecular Docking

The docking process was carried out using Autodock vina in PyRx 0.9.3 to compute the binding affinity between ligands (active compounds of *Camellia sinensis*) and protein target. Each of active compounds

were docked to specific active site of protein target [14].

### Molecular Interaction

The molecular interaction between active compound and protein target was analyzed by Discovery Studio Program. The result determination was based on the amino acid interaction. The active compound would be determining as potential inhibitor if they had interacted to amino acid in the active site of protein target.

### Molecular Visualization

All biomolecules were visualized using Discovery Studio to generate the representative figure.

## Findings

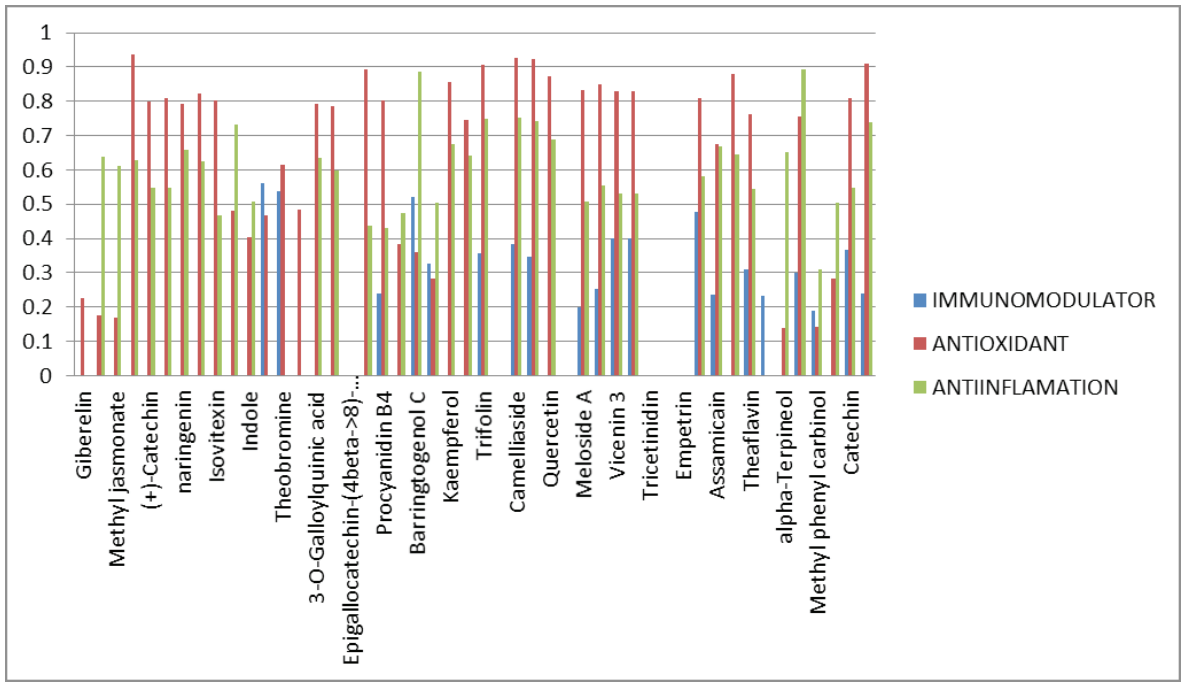


**Figure 1. Biological activity prediction of *Camellia sinensis* showed its potentials as immunomodulator, antioxidant, and immunomodulator.**

**Table 1. Docking Result of *Camellia sinensis* bioactive**

| No. | Compounds | BINDING AFINITY | |
|---|---|---|---|
| | | CASPASE 1 | CASPASE 3 |
| 1 | Cis-Jasmone | -4.6 | -5.4 |
| 2 | Giberelin | -6.2 | -6.5 |
| 3 | Salicylaldehyde | -4.1 | -4.7 |
| 4 | Methyl phenyl carbinol | -4.2 | -4.9 |
| 5 | alpha-Terpineol | -4.3 | -5.3 |
| 6 | Theaflavin | -7.5 | -8.7 |
| 7 | Xanthine | -4.8 | -8 |
| 8 | Idaein | -6.7 | -7 |
| 9 | Empetrin | -6.5 | -6.8 |

***Cont...*** **Table 1. Docking Result of *Camellia sinensis* bioactive**

| | | | |
|---|---|---|---|
| 10 | Tricetinidin | -6 | -6.6 |
| 11 | Isoschaftoside | -6.6 | -6.9 |
| 12 | Vicenin 3 | -6.4 | -8.2 |
| 13 | Quercetin | -5.8 | -6.8 |
| 14 | Meloside A | -6.9 | -6.6 |
| 15 | 6,8-Di-C-beta-D-arabinopyranosylapigenin | -6.6 | -6.6 |
| 16 | Nicotiflorin | -7 | -7.1 |
| 17 | Camelliaside | -6.1 | -6.6 |
| 18 | Astragalin | -6.7 | -6.3 |
| 19 | Trifolin | -6.8 | -6.4 |
| 20 | Pollenitin | -5.8 | -6.6 |
| 21 | Kaempferol | -5.6 | -6.6 |
| 22 | (E)-Citral | -4.1 | -5 |
| 23 | Barringtogenol C | -6.8 | -6.6 |
| 24 | 3-O-Caffeoylquinic acid | -6.1 | -7.4 |
| 25 | Procyanidin B4 | -6.6 | -6.8 |
| 26 | Prodelphinidin B4 | -6.5 | -7.6 |
| 27 | Theobromine | -4.7 | -6.3 |
| 28 | Theophylline | -4.7 | -6.2 |
| 29 | 3-O-Galloylquinic acid | -5.9 | -6.7 |
| 30 | Caffein | -4.7 | -5.4 |
| 31 | Indole | -5.2 | -6.4 |
| 32 | Naringenin | -5.8 | -6.9 |
| 33 | Isovitexin | -6.2 | -6.6 |
| 34 | (-)-Epicatechin | -5.6 | -6.7 |
| 35 | (+)-Catechin | -5.7 | -7 |
| 36 | Dihydroquercetin | -5.7 | -7.1 |

Interaction between theaflavin with caspase 3 and caspase 1 showed that this complexed was stabilized by hydrogen bond and hydrophobic interaction. The active site of Caspase 3 tends to more hydrophobic than caspase 1 (figure 2).**gure 2.** Theaflavin bind to Caspase 1. (figure 2).

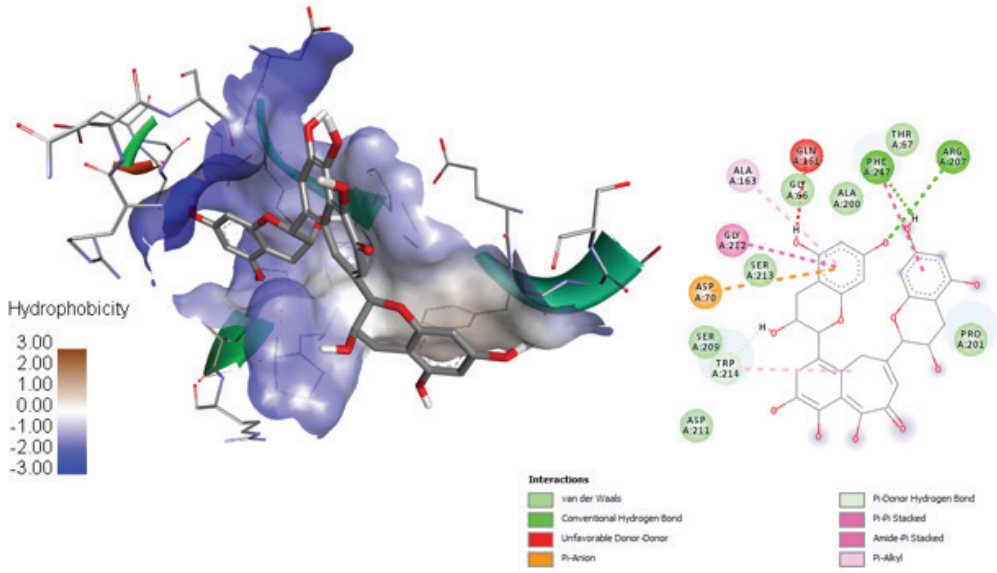


**Figure 2. Theaflavin bind to Caspase 1**

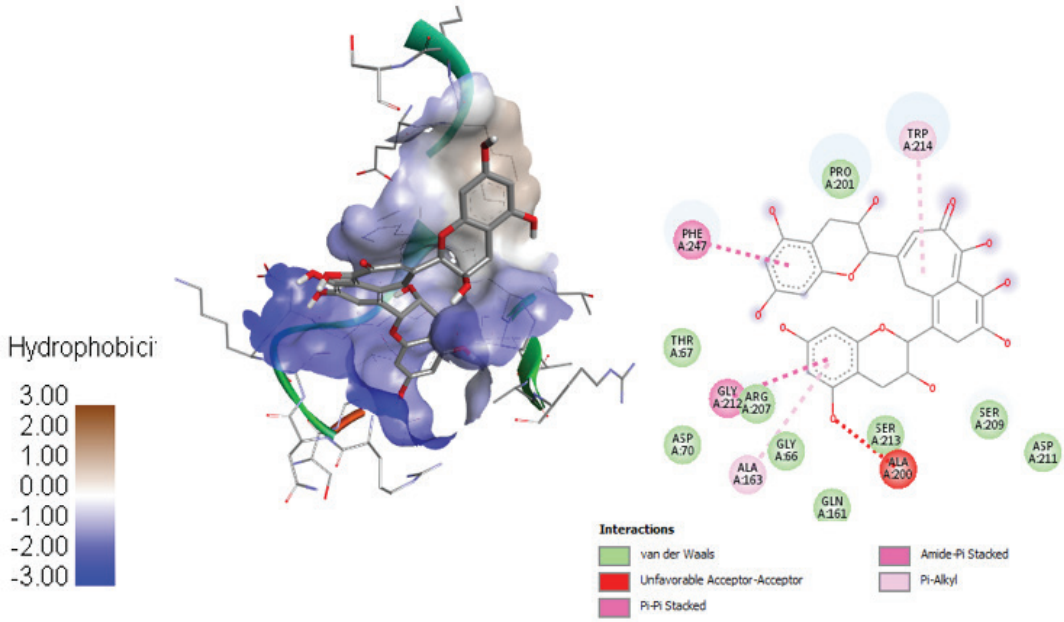


**Figure 3. Theaflavin bind to Caspase 3**

## Discussion

Biological activity prediction of *Camellia sinensis* showed that this herbal has three potentials as immunomodulator, antioxidant, and immunomodulator. Most of compounds have antioxidant activity with the score probability activity (Pa) above 0.7 (Pa>0.7). This result followed by anti-inflammation activity and immunomodulatory activity. Both activities have probability activity above 0.3 (Pa>0.3) (Figure 1). The value of Pa and Pi can be considered to be measures of the compound to study belonging to active and inactive compounds respectively [14].

Molecular docking is widely used to identify and predict a new ligand for substrate or protein target in specific site. Generally, the potential of active compound (ligand) is determined by binding affinity value in docking process. Table 1 shows that each of active compound of *Camellia sinensis* has strongly

bind to protein target of Caspase 1 and Caspase 3. The highest affinity is Theaflavin that has binding affinity -7.5 Kcal/mol to Caspase 1 and -8.7 to caspase 3. Apoptosis process is mediated by Caspase 3. To inhibit this mechanism, bioactive compound of *Cammellia sinensis* should bind to the active site of Caspase 3. One of bioactive compound from *Camellia sinensis* that promising for inhibitor is theaflavin. Other target is Caspase 1. this protein has the main role in pyroptosis. Surprisingly, the result of molecular docking is theaflavin could bind to this protein as well as caspase 3. The multi-target mechanism of herbal is commonly well-known. This mechanism can reduce the adverse effect and has more benefit than synthetic drug. Systemic Lupus Erythematosus pathogenesis related to innate and adaptive immune response such as inflammasome, apoptosis, clearance apoptosis, pyroptosis [5; 6; 15].

*Camellia sinensis* can strongly bonded with Caspase 1 as a target for the treatment of systemic Lupus Erytematosus by using the mechanism of Pyroptosis. Pyroptosis is one of the mediator for SLE pathogenesis. Pyroptosis begins an inflammatory process in SLE. The inflammation occurs due to an increasing of immune comlexes antinuclear antibodies (ANA) with nuclear antigens. This will triggers the damage of tissue and cell death. Pyroptosis is a form of cell death that occurs SLE. Pryroptosis can be induced by an inflammatory process during the pathogenesis of lupus. Pyroptosis can be characterized by the presence of HMGB1 and ATP where it acts as an inflammatory DAMP. The product of pyroptosis is the release of intact nuclei and the formation of LE cells [5, 16, 17, 18].

Caspase 1 is an enzyme that processes interleukin-1 (IL-1) and IL-18 into its active form during the inflammatory process. In the presence of autoantibodies, the immune complex activates the inflammasome machine in monocytes [19-22]. It can be concluded that the precipitating factors for autoimmune if nuclear and cellular autoantigens are found, the release of inflammatory cytokines such as (IL-1 and IL-18) and the release of danger molecules such as HMGB1 and ATP. The changes of immune system during the inflammatory process will trigger to lose of tolerance and induce autoimmune [5, 16, 17, 18].

The process of cell death through pyroptosis or apoptosis will have an impact on tissue damage and immune dysregulation, especially developing into lupus nephritis [23]. Considering the process of inflammation and cell death in pathogenesis SLE, a therapy to prevent inflammation and cell death, proven effective in the treatment of SLE.

## Conclusion

It can be concluded that Camellia sinensis is promising for Systemic Lupus Erythematosus by acting as antioxidant, antiinflammation, antiapoptosis, and anti pyroptosis. Experimental analysis is necessary for proving this result.

**Ethical Clearance-**obtained from the ethics commission of Medicine Faculty, Brawijaya University.

**Conflict of Interest-**no conflict of interests regarding the publication

**Source of Funding-**the Directorate of Research and Community Service, Directorate General of Research and Development Strengthening, Ministry of Research, Technology and Higher Education (Kemenristekdikti).

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# Herpes Virus, Causes of Infections and Preventive Methods

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## Abstract

Herpes simplex virus (HSV) usually has two groups, including HSV1 and HSV2. HSV1 often causes skin and mucous membranes in the upper part of the body like the nose and mouth. HSV2 group causes skin disease in the genital mucosa. This type of virus is quite common in our life today, has a great influence on human health and needs certain attention. The paper was based on previous research as well as conducted with the collected data from surveys of 40 patients infected with herpes simplex virus among 250 people who were asked at two dermatology hospitals in southern Vietnam between March and April 2019. Thanks to the analysis method developed by Hancock, this research aims to verify some causes of infecting herpes simplex viruses, effective treatment methods as well as ways to prevent this kind of disease in order to enhance common knowledge for the prosperity of human beings. Accordingly, some solutions have been recommended with the purpose of making our world a better place to live.

***Keywords****: Health, Herpes Viruses, Infections, Prevention.*

## Introduction

The proceedings are the records of the conference. ACM hopes to give these conference by-products a single, high-quality appearance. Herpes virus is thought to be a very wise and stubborn. Once they reside in the body, they will never leave the host. During the initial exposure, herpes virus quickly invades neurons in place and occupies there. They may not work immediately but are always ready to start at any time. Researchers always believe that there will be a way to completely remove them from the body. The CRISPR / Cas9 gene modification technology is being used to target specific DNA sections of herpes virus, applying techniques to eliminate the ability of the virus to cross-copy with the goal of completely removing the virus from the body. Researchers are working on animal models to be able to apply this technology to practice in the most effective ways[1].

## Content

### Definition of herpes virus and its types

Herpes simplex virus includes types 1 and 2 which can infect both skin and nerves of human beings. These viruses are rather common and infect both children and adults. In fact, herpes simplex virus consists of more than 80 types that are found in not only humans but also animals ranging from domestic ones such as cats, dogs or birds to other bigger ones such as monkeys, cows or horses[7, 9].

Of the 80 types, types 1 and 2 are the most concerned ones due to their harms. After infecting the immune system of the patient, they will intrude neurons of the dorsal root ganglia and stay there as their lifelong location[9]. Herpes simplex virus type 1 is often the cause of sores around the mouth and lips (sometimes called vesicles or cold sores). Moreover, HSV-1 can cause genital herpes athough most cases of genital herpes are caused by type 2 herpes. People infected with HSV-2 may have ulcers around the genitals or rectum. For the diseases and symptoms induced by HSV-2, sores may be present in other locations but are often detected under the waist[5].

### The signs and symptoms of herpes disease

Oral herpes is often asymptomatic, and most people infected with HSV-1 do not know they are sick. Symptoms of oral herpes include sore or blisters appearing in or around the mouth. Sores on the lips are often called cold sores. Infected people often have tingling, itching or burning sensations around the mouth before the appearance of sores. After infecting, blisters

or ulcers can recur at a different time of the year. The frequency of relapse in each person is very different [Fig 1].

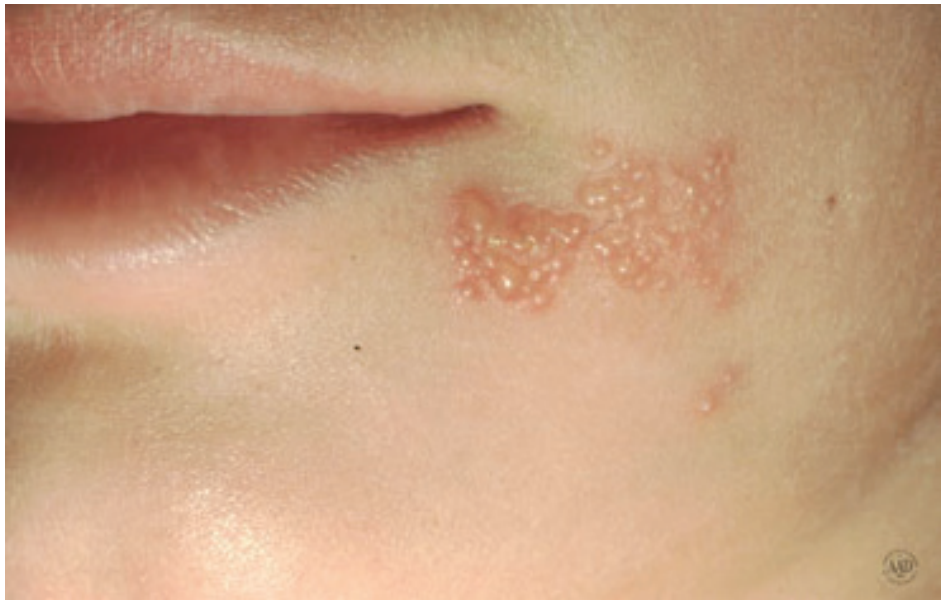

**Fig 1. The image of herpes**

Genital herpes usually has no signs, light symptoms or unnoticeable symptoms. Most patients do not know they have an infection. Normally, about 10-20% of people with HSV-2 have previously had genital herpes.

When symptoms appear, people with genital herpes will definitely have a lot of genital, anal or ulcerative ulcers. In addition to ulcers, symptoms of new genital herpes infection usually include fever, body aches and swollen lymph nodes [Fig 2].

**Fig 2. The image of swollen lymph nodes**

Humans are commonly infected with chronically genital herpes through sexual transmission and there is no cure for it[9]. Most of the patients hardly ever know that they suffer from genital herpes. The viruses can also be passed from parents to their children during birth. Moreover, if there is no appropriate treatment, most infants may not be alive or at least they will suffer from brain damaging.

**The cause to the illness**

Herpes simplex virus is a direct, infectious virus. Children will often be infected with HSV-1 when they are exposed to an infected adult and will always become infected if they are left untreated. Adults can also be infected with HSV-1 via sharing eating utensils or kissing lips. The virus will spread very fast when a person is infected with it. In addition, there will be genital herpes caused by HSV-1 if there is a cold sore and sexual activity during that time. We should also note that HSV-2 is likely to infect the reproductive organs, so we need to be careful to avoid the infection[4, 6].

**Risks of getting herpes**

According to WHO, an estimated 3.7 billion people under 50 years old (67%) are infected with HSV1 and about 417 million people aged 15-49 (11%) are infected with HSV2. People will be at high risk of having unprotected measures such as condoms. In addition, a number of other factors increase the risk of disease HVS-2, for instance, contacting with many sexual partners, especially for female; having a sexually transmitted infection (STI) and the weak immune system.

**Modern treatments and traditional therapies**

Although there is no absolute cure for herpes, some treatments can relieve its symptoms. Drugs can reduce pain, shorten the healing time and reduce the number of subsequent outbreaks. Doctors can use some medicines like Famvir®, Zovirax® and Valtrex® to relieve the symptoms[8].

However, using purple echinacea daisies to treat herpes is also a rather effective way. Purple chrysanthemum tea is believed to help boost the immune system since it supports the body's natural immune response while fighting the viruses

We can also take supplements up to 4 times a day with 300mg each to boost our immune system. Children are not allowed to use purple daisies without consulting a doctor. People with autoimmune disease, diabetes, tuberculosis, connective tissue disorders, multiple sclerosis, liver dysfunction, HIV or AIDS should not use purple daisies. Besides, people who are allergic to chrysanthemum may also be allergic to purple daisies because their its side effects[7].

Using lemon balm or aloe vera is considered to be another choice. Studies assume that these plants help reduce redness and inflammation in herpes and decrease the risk of re-infection as well. Lemon balm and aloe vera is available in most nutritional and herbal stores as a form of a supplement, topical cream, tincture and herbal tea[2, 4].

## Methodology

Thanks to the framework compiled from previous studies. The study was conducted under surveys of interviews with 40 patients who have been suffered from herpes simplex virus at two big hospitals in Vietnam, the HCMC Hospitals of Dermato Venereology and Can Tho Hospital of Dermato Venereology in Vietnam. Only patients who have diagnosed to be infected with typical symptoms were asked to join our interviews. After aspects of the problem under information had been collected, an analysis method developed by Hancock was applied to analyse the statistics.

RESULTS AND RECOMMENDATIONS

In 250 patients at the hospitals who were asked, various types of dermatological diseases were recognised. They are illustrated in Figure 3.

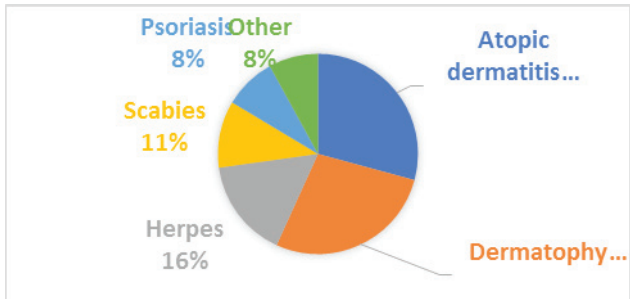


**Fig 3. The frequency of dermatophytosis diseases between March and April 2019.**

According to the graph, atopic dermatitis and dermatophytosis are the most two common

dermatological diseases, occupying 29 percent and 28 percent respectively. Meanwhile, 16 percent of patients were infected with herpes virus. The least common were Scabies (11 percent) and Psoriasis (8 percent). The other diseases such as tinea captitis, hives larticaria, juvenile plantar dermatosis, etc. shared 8 percent.

Causes of herpes virus infection found out from the 40 interviews are not surprising. To limit the progression of herpes, our living habits should be carefully concerned. First, avoiding direct contact with people who are sick is important. Besides, we must not share any items that may transmit viruses around such as glasses, towels, jewelry, clothing, makeup, lipsticks and personal belongings. However, most people recognize that avoiding any kinds of sexual activity with an infected person is a vital thing to prevent infection. If the person has no signs and symptoms but was previously diagnosed with the virus, they should use a condom when having sex. A lot of patients said they had seen the similar signs of herpes on their sexual partners before they recognised them on their body parts. However, eye touching is another thing they should take into consideration as they do not realize the harmful effects of this action whether they will be infected or not [Fig 4]. In order to avoid being infected with the virus, each reason for herpes infection should be strictly kept away.

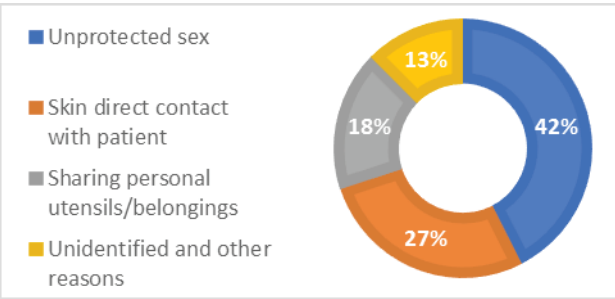


**Fig 4. Reasons for genital herpes infection.**

The pie chart shows the means of infection with herpes simplex virus. Having unsecure sexual activities was the most popular one, at 42 percent, followed by skin direct contact with infected people (27 percent) and sharing personal utensils between the healthy people and the patients (18 percent). 13 percent of people were infected with other reasons and some had no idea why they were infected because not only did they have unprotected sexual activities but they also lived and used the same utensils with the patients.

Some people have bad habits such as using saliva to wet contact lenses. They are not careful when applying makeup and removing makeup. Meanwhile, other people believe that they use cream or makeup powder can help cover herpes or sores or they will be prone to bacterial infections in the surounding environment. In fact, the sores will no longer cause infection once they have healed completely and the affected skin has returned to normal.

**A breakthrough in modern medicine about future treatments for herpes**

Acyclovir was developed and used in 1982. It has been shown to be effective and inhibit viral growth. Next, nucleoside antiviral and its derivatives are the first drugs that can fight this disease[8].

It is reported that the drug is only effective in reducing symptoms, there is no inhibitory effect on viral replication because the drug is not strong enough. Using this drug for a lomg time only reduces the transmission by about 50% and it is not effective for severe herpes infections, high risk of death such as encephalitis, neonatal herpes infection. In fact, most patients were advised to use acyclovir to treat their disease [Fig 5].

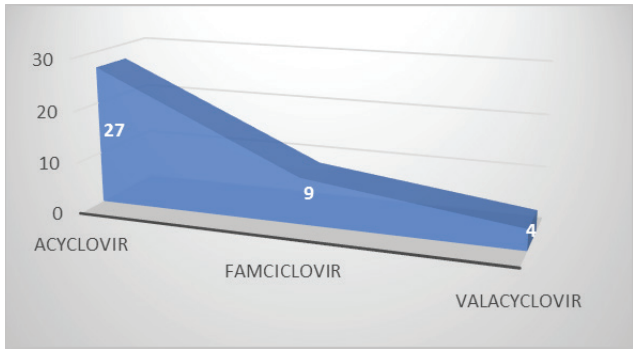


**Fig 5. The frequency of suggested three different types of medicine in presciptions.**

Therefore, a new generation called the helicasse inhibitor group was born that has helped contribute to the improvement of herpes treatment. The first experiment of the helicase inhibitor group, pritelivir with a daily dose of 75 mg, showed that the decrease in viral transmission in the drug group was only 2.1% compared to 16.6% of the placebo group.

**Vaccines to treat Herpes**

Most of the body's immune systems are able to

fight the herpes virus and make it exist in a hidden state, which is not dangerous to the body. Therefore, the researchers based on that to develop a kind of genital herpes treatment vaccine called GEN-003. This vaccine reduced the ability to spread across the skin by about 50% for at least 12 months. This result is equivalent to taking nucleoside daily. Patients do not need to take medicine daily, but only use three divided doses for each 21 days apart, which is effective in preventing and is suitable for those who have difficulty in taking drugs. In fact, the vaccine is planned to be submitted to the US Food and Drug Administration and is expected to be available by 2020[3].

**Using 10 natural methods for treating herpes ulcers**

Chinese have used traditional ways to treat herpes virus. Such methods with their positive effects are not groundless. If we are patient and apply herbs or other trivial things, the effect will be sometimes relatively good. More significantly, it is convenient in case we have no time to go to the hospital, have no good conditions, or are psychologically afraid to see a doctor [4, 10].

Among the traditional methods, ice is approachable. Cold sores often have a little pain and swelling. Patients just need to rub ice directly onto the pain. This simple measure will temporarily reduce the discomfort by the disease.

The next method is milk since it may be resistant to cold virus-like viruses. In addition, milk containing lysine which can fight ulcers. Milk should be drunk in order to fortify the body.

Aloe vera also has its great impact on treating herpes ulcers. Cold ulcers can be very painful and the aloe vera's gentle anti-inflammatory effect is good for relieving pain while direct gels do not produce much results[7].

Peppermint oil is considered as a smart choice if we want to kill the virus causing herpes. Patients should try using some peppermint oil every day, applying it directly to the wound and the oil will help heal the disease faster[4].

Corn flour is normally seen as a food but grafting cornstarch can neutralize the acidity of the ulcer, making the virus unable to thrive.

Then, melissa officinalis, known as lemon balm, is often used for food or juice in some Asian countries. In fact, it can promote rapid healing of ulcers, make the wound tighten and this process becomes more quickly [Fig.6].

**Fig 6. The image of melissa officinalis**

Glycyrrhiza uralens (Chinese liquorice) can be used to make dough or made into a paste. By applying it on the ulcers, the patient can soothe ulcers, fight inflammation, reduce swelling as well as redness.

Honey works very well with cold sores due to its powerful anti-inflammatory effect. We only need to use a cotton cloth to apply honey to acne and wash it after 30 minutes.

Finally, a peeled garlic clove can be one of the good methods. It can be applied onto the location of the acne and hold for 10 minutes. After that, the patient has to rinse the location with warm water. It requires the patient to conduct it once every two hours for several days.

## Conclusion

All patients diagnosed with herpes virus should receive medication as soon as possible and get advice on the risk of relapse as well as how to reduce recurrence. The purpose of antiviral therapies including Western medicine and Oriental remedies is to reduce symptoms by the disease. However, to determine exactly whether or not we are sick with the herpes virus, we should seek medical advice for specific treatments and prevention of sequelae.

**Limitations of the Research**

Research scope is among limitations in the current

study and we hope that the future research should expand the number of respondents as well as diversify research questions in order to find out different aspects of better medications.

**Ethical Clearance:** I am ensuring the quality and integrity of our research. The ideas and opinions expressed in this paper are our effort. By writing this paper, we surely respect the confidentiality and anonymity of our research respondents since they participated in our study voluntarily.

**Conflicts of Interest:** No conflicts of interest noted in the paper.

**Source of Funding**: The paper was completed thanks to the support of FPT University

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# Association between Inactive-Gymnastics and Active-Gymnastics Elderly towards Cognitive Functions Measured by The Mini-Mental State Examination (MMSE)

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## Abstract

**Background** : The decline of cognitive function is a problem that often experienced by the elderly. **Objectives :** to determine the role of elderly gymnastics towards cognitive function.

**Methods :** A total of 50 elderly patients that fulfilled the inclusion and exclusion criteria in Kedurus village, Surabaya, from September to October 2013 were conducted. The cognitive function was examined using The Mini-Mental State Examination (MMSE) and the results were allocated to two groups: the case group with the MMSE score less than 26/30 while MMSE control group from 27/30.

**Results :** During the study, 50 subjects were enrolled (25 case groups and 25 control groups). It was obtained in case group that did inactive-gymnastics was 15 (60%) and active-gymnastics was 10 (40%), with P = 0.047 and OR 3.188 (CI 0.99-10.17)

**Conclusion :** There was no significant correlation between inactive-gymnastics elderly and active-gymnastics towards cognitive function.

***Keywords:*** *Cognitive Function, Elderly, Gymnastics Elderly*

## Introduction

The structure of the world's population including Indonesia is currently towards the aging process that characterized by the increasing number and proportion of the elderly population. The proportion of elderly people in Indonesia has increased significantly over the last 30 years with a population of 5.3 million people (4.48 percent of the total Indonesian population) in 1971 to 19.3 million (8.37 percent of the total Indonesian population) in 2009[1].

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The aging process is a natural process that characterized by a decrease or changes in physical, psychological and social conditions in interacting with others. The aging process will occur continuously naturally from birth to aging. The aging process is not a disease but is a process of decreasing the body's resistance in the face of internal and external stimuli of the body[2].

However, most of the elderly process is still within normal limits due to the plasticity process. This process is the ability of a related brain structure and function to keep developing because of stimulation. Therefore, in order not to quickly back off this plasticity process, it must be maintained[3].

One attempt to inhibit cognitive deterioration due to aging is by doing sports movement or physical exercise. Truthfully, someone grows old because they do not want to move. Exercise could increase the potential work of

the brain is improving general physical fitness in the form of brain exercise that intellectually stimulating activity who aims to maintain brain health by doing bodybuilding[4].

Structured and programmed movement learning is used to stimulate different learning centers in the brain. Movements that cause left and right hemisphere functions work together is to strengthen the correlation between the two hemispheres. Movements across the midline of the body could integrate the two hemispheres of the brain so that the brain is able to organize itself[5]

There are many factors that affect cognitive abilities in elderly. It is stated that by living a healthy lifestyle and exercising the body and mind of the elderly could slow down the process of mental decline. In general, we could argue that activity is a key factor in maintaining a quality of life in elderly. Maintaining mental fitness is considered to be important in the continuous quality of life of the elderly[6].

Other studies have reported that some physical activity might cause the changes in the brain structure (increasing the number of neurons and branched dendrites). It also reported that in the elderly through aerobic exercise (brisk walking of an hour walking) or yoga-type stretching could improve their cognitive function on cognitive tests[7],

Provision of exercise in the elderly began with the light intensity and time then increased slowly and ut tend to uncompetitive/compete. Sports exercise for the elderly has great benefits because it could increase aerobic ability that will increase the flow and volume of blood supply that carries oxygen to the organs of the body especially to the brain organ[8].

This study aims to determine the correlation between inactive-gymnastics elderly and active-gymnastics elderly toward cognitive function as measured by The Mini-Mental State Examination(MMSE).

## Methods

This research was an observational analytic research using case-control design which implemented in September 2013 to October 2013 in Kedurus District of Surabaya. All elderly people who follow both inactive and active-gymnastics that meet the criteria for inclusion and exclusion were used as the samples.

The control inclusion criteria were; Aged 60-70 years, Men and Women, more than 27 for MMSE scores. The exclusion criteria for the control of this study were among others were; Brain tumor, moderate to severe brain injury, stroke, Not willing to participate in the research. Exclusion criteria of case research were; Experiencing cognitive impairment with obvious causes of structural lesions (brain tumor, moderate to severe brain injury, stroke), Unwilling to take part in research.

The independent variables were inactive-gymnastics elderly and active-gymnastics elderly. The dependent variable was the cognitive function that measured by MMSE while confounding variables were diabetes mellitus, hypertension, heart disease, uncontrolled dyslipidemia, education, smokers, alcohol drinkers.

Prior to conducting this study, the researcher had a data retrieval procedure as well as a pickup flow that began by selecting the appropriate elderly in the inclusion criteria and given an explanation of the purpose and usefulness about this study research, then asked to participate without coercion. At the end of the explanation, the subject asked to read, ask about things that have not been understood yet. If they have understood and agreed, then they were required to sign an approval letter. Examination of cognitive function was performed by MMSE. If there were things that have not been understood or less clear, it could be asked back to the doctor who gives an explanation (Resident in-training I neurology by giving a phone number).

All recording results were collected for further data tabulation and statistical analysis. Collected categorical data were analyzed by using chi-square test while numerical data were analyzed by unpaired t-test. This study used SPSS 17.0 program.

## Results

All study subjects performed to recording demographic data including sex, age, last education, and type of jobs. All elderly were-examined for cognitive function by using MMSE. There were 50 subjects consisting of 25 subjects with normal MMSE results that called as controls and 25 subjects with disturbed MMSE results that referred to as cases.

**Demography data**

There were 50 subjects which consist of 25 subjects for case group and 25 subjects for the control group.

Characteristic of Research Subject Based on Mean Age

The mean age of case study subjects was 63.60 ± 4.093 years, while the control group was 63.40 ± 3.617 years (P = 0.333) shown in table 1.

**Table 1. Characteristics of study subjects based on mean age**

| | **Cognitive Function** | | | | **P** |
|---|---|---|---|---|---|
| | **Case** | | **Control** | | |
| | Mean | Std.Intersection | Mean | Std.Intersection | |
| Age | 63,60 | 4,093 | 63,40 | 3,617 | 0.333 |

Clinical data

**Characteristics of Research Subjects Based on Mean of Systolic Blood Pressure**

Characteristics based on blood pressure was in table 4, in the case group the mean of systolic blood pressure was 137.60 ± 7.234 and in the control group was 133.20 ± 10,693 with p = 0.051.

**Table 2. Characteristics of research subjects based on mean systolic blood pressure**

| | **Cognitive Function** | | | | **P** |
|---|---|---|---|---|---|
| | **Case** | | **Control** | | |
| | Mean | Std.Intersection | Mean | Std.Intersection | |
| TD | 137,60 | 7,234 | 133,20 | 10,693 | 0.051 |

**Characteristics of Research Subjects Based on Mean of Systolic Blood Pressure**

Characteristics based on smoking risk factors in case group was 3 (12%) and control was 1 (4%), while non-smokers in case group was 22 (88%) and control was 24 (96%) with P = 0.297, in table 3.

**Table 3. Characteristics of research subjects based on smoking risk factors**

| | **Cognitive Function** | | **Total** | **P** |
|---|---|---|---|---|
| | **Case** | **Control** | | |
| Smoking<br>Yes<br>No | 3 (12%)<br>22 (88%) | 1 (4%)<br>24 (96%) | 4<br>46 | 0.297 |
| Total | 25 (100%) | 25 (100%) | 50 | |

**Mean of Random Blood Glucose Level (GDA) on study subjects**

Characteristics of subjects based on random blood glucose levels have obtained the mean in the case group was 115.32 ± 55.426 and in the control group was 101.92 ± 45.767, with P = 0.101.

**Table 4 Mean of Blood Glucose Ratios (GDA) in the study subjects**

| | **Cognitive Function** | | | | **P** |
|---|---|---|---|---|---|
| | **Case** | | **Control** | | |
| | Mean | Std.Intersection | Mean | Std.Intersection | |
| GDA | 115,32 | 55,426 | 101,92 | 45,767 | 0.101 |

**Characteristics of subjects based on mean serum LDL levels**

Characteristics of subjects based on serum LDL levels, in the case group, have obtained mean was 120.12 ± 20.547 and in the control group was120.60 ± 29.364 with p = 0.177.

**Table 5. Characteristics of subjects based on mean serum LDL levels**

| | **Cognitive Function** | | | | **P** |
|---|---|---|---|---|---|
| | **Case** | | **Control** | | |
| | Mean | Std.Intersection | Mean | Std.Intersection | |
| LDL | 120,12 | 20,547 | 120,60 | 29,364 | 0.177 |

**Correlation of inactive-gymnastics elderly and active-gymnastics elderly toward cognitive function**

The differences in cognitive function in case group inactive-gymnastics elderly was 15 (60%) and 10 (40%) of active-gymnastics elderly, (p = 0.047).

**Table 6. Correlation of inactive-gymnastics elderly and active-gymnastics elderly toward cognitive function**

| | **Cognitive Function** | | | | **p** | **RO (IK 95%)** |
|---|---|---|---|---|---|---|
| | **Case** | | **Control** | | | |
| | **N** | **%** | **n** | **%** | | |
| Active-gymnastics<br>Yes<br>No | <br>10<br>15 | <br>40<br>60 | <br>17<br>8 | <br>68<br>32 | 0.047 | 3,188 (0.99 – 10.17) |
| Total | 25 100 | | 25 100 | | | |

There was also an OR of 3,188 - (CI 95% 0.999 - 10,171), so the subjects of inactive-gymnastics elderly had OR for cognitive impairment by 3.18 times compared to the active-gymnastics elderly, but not statistically significant

because they contained a number 1 in the interval confidence (95% CI 0.999 - 10,171).

## Discussion

In the basic data characteristic of subjects, there was no significant difference in some basic variables, in this study was attempted to all subjects in almost equal condition, wish to minimize the influence of other factors that will affect cognitive function.

In one study linking physical activity and decreased risk of Cognitive Impairment (CI), in elderly there was a difference between women who did high physical activity to decreased risk of Cognitive Impairment (CI) (OR 0.58; 95% CI, 0.40-0.82) and at men no significant difference, this was due to the elderly women occur menopause which very influential on lipid profiles, so that physical activity in elderly was very useful to keep the occurrence of decreased cognitive function, especially in women[9].

From age characteristic in both groups, there was no difference of mean age between case group and control. According to WHO a person has been categorized as elderly at age 60 years and above. In this research was limited to the age range of 60 to 70 years, and the mean age of study subjects was almost the same (63.60 ± 4.093 years) compared to the control group (63.40 ± 3.617 years). There was no significant difference between case group and control group with p = 0.333.

Characteristics of education level were divided into four groups; elementary school, junior high school, senior high school, and college. The higher the level of education then the cognitive function will be better[10]. Characteristics of education level were divided into the level of education; elementary school, junior high school, senior high school, and college. The higher the level of education then the cognitive function will be better[10]. The comparison of the level of education obtained at the level of elementary education was 13 (52%) people in the cases group larger than the junior high school and senior high school level but in this study, there was no significant correlation P = 0.163.

The characteristics of the type of job status were; unemployed in case group was 23 (92%), in control group was 22 (88.0%). In the employee was obtained in case group by 2 (8,0%) and the control group by 3 ( 12%) while in the unemployed group, the percentage of cases was greater and in the working group. This in accordance with studies that stated, still working after retirement could sustain the elderly cognitive function, unemployed elderly have poor cognitive performance, which found from 41% of 50-60 year unemployed have the ability to recall memory compared to that the employee one[11].

Smoking as a confounding factor against cognitive dysfunction, in a study that conducted to search at the smoking correlation with cognitive function, was found that smoking causes a 0.13 point/year drop in MMSE values compared to non-smokers. There was no significant correlation with P = 0.297, this might be due to men smoke more and most of them inactive at gymnastics.

Mean of systolic blood pressure, in case group was 137,60 ± 7,234 and in control group was 133,20 ± 10,693, there was no significant difference in both groups with p = 0,051. In a study that looks at the correlation between hypertension and cognitive function, the mean of MMSE values was lower in the hypertension group by 25.9 ± 3.9 than in the normal blood pressure group. This decrease in cognitive function was correlated to vascular damage by arteriosclerosis in large vessels and stress oxidative properties in blood vessel walls[12].

Mean of random blood sugar level with cognitive function has no significant difference in both groups, in case group by 115,32 ± 55,42 and in control group by 101,92 ± 45,767 with value p = 0.101. In a study that correlates blood sugar level and cognitive function has obtained the correlation between high blood sugar levels with decreased cognitive function[13].

Mean of serum LDL level with cognitive function has no difference in both groups, in case group was 120,12 ± 20,547 and in control group was 120,60 ± 29,36 with p = 0.177. In a study that linking Lipid profile and cognitive function with LDL case group 130.5 ± 29.6 and control 112.3 ± 35.6 has a significant correlation to cognitive function decline with p = 0.038[14].

Examination of cognitive function was by using MMSE score which one of cognitive aspect examination of mental function, orientation, registration, attention,

vigilance recall, visuospatial and language used was to assess the change of cognitive function[13], ideally, a measuring instrument has sensitivity and high specificity. The MMSE values was under 27/30 considered as abnormal and indicate cognitive impairment, while the values under 24/30 were suspected of a Dementia Syndrome[15].

In this study, there was no statistically significant correlation between inactive-gymnastics elderly and active-gymnastics elderly to cognitive function, with CI 95% (0.999 - 10.171). According to WHO (2010), there were various activities that could perform by elderly to maintain cognitive function such as walking activity, cycling, doing daily tasks at home and play activities, so gymnastics was not the only physical activity that required by elderly to maintain cognitive function and fitness, activity is a key factor in maintaining quality of life in old age[6]

## Conclusion

There was no correlation between inactive-gymnastics elderly and active-gymnastics elderly with cognitive function.

**Ethical Clearance**: The present study was carried out in accordance with the research principles. This study implemented the basic principle ethics of respect, beneficence, nonmaleficence, and justice.

**Conflict of Interest:** None declared

**Source of Funding:** This study is done with individual funding.

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# The Politics of Judicial Law in the Development of the National Health Law

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## Abstract

Normatively, the follow up on the Constitutional Court's Decree has been regulated in the Constitution No.12 of 2011. Yet, the mentioned norm has not optimally regulated the follow up of the Constitutional Court's Decree as one of the main sources in the planning and the renewal of the national law. This is shown by the fact that there was a norm which was annulled by the Constitutional Court, yet it was still written in the new Constitution. Because of that, the Constitutional Court's verdict, especially those regarding the politics of judicial law, is crucial to be included in the national law planning and development documents as a guide for the lawmakers in the form of the Constitution. This is because the Constitutional Court's decree includes the politics of the judicial law, which determines the road of the national health law's development, so that the constitution in the aspect of health will not be against the 1945 Constitution.

This research is a qualitative study, by using the post-positivism paradigm and the juridical-normative approach. The research approach used is statute approach and case approach. The research approach is used to see the politics of the judicial law contained in the Constitutional Court's Decree which should have been the guide of the national health law development.

***Keywords:*** *verdict, politics of judicial law, law development.*

## Introduction

The constitutional change which happened in the period of 1999-2002 has changed the design and the structure of the governance in Indonesia. The birth of some new stately institutions such as the Constitutional Court, the Regional Representatives, and the Judicial Commission are the means to strengthen the check and balance mechanism between the stately institutions. The Constitutional Court was created in the third amendment of the constitution's change. Yet, this institution was only effective in carrying out its constitutional tasks after the issuing of the constitution which regulates the Constitutional Court, which was the Constitution No. 24 of 2003 regarding the Constitutional Court on August 13th, 2003. The Constitutional Court consists of nine judges in which each three were appointed by the President, the Legislative House, and the Supreme Court with a five-year term of office. They may then be reappointed for one term of office.

Based on the stipulations of Article 24C of the Republic of Indonesia's 1945 Constitution, *juncto* of the Constitution No. 8 of the years 2011 the Constitutional Court has four rights and one responsibility, which are:

(1) Testing the Law against the Republic of Indonesia's 1945 Constitution;

(2) Making the verdict upon stately institution power dispute, in which its power was given by the Republic of Indonesia's 1945 Constitution;

(3) Making the verdict on the dissolution of political parties; and

(4) Making verdict on the disputes of the general election results.

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The presence of the Constitutional Court and its constitutional review is aimed to create the check and balance mechanism between the stately institutions so that there are no misuses of power in the establishment of the state, as stated by Lord Acton[1], *"power tends to corrupt, absolute power corrupt absolutely.* Because of that, as the executor of the check and balance mechanism, if the health constitutions as the legislative house's products are proved to be against the constitution, it can be revoked by the Constitutional Court. Apart from undergoing constitutional trials, the Constitutional Court is also known as undergoing norm trials. This is because there is the Constitutional Court's power in testing the constitutionality of a constitution.

In its development, especially after the change of the 1945 Constitution, there are new legal sources which must become the guide in undergoing the national law renewal, which is the Constitutional Court's verdict. Normatively, the Constitutional Court has the role as the negative legislature, which functions in annulling the norms in the constitution, including those regarding health. According to Hans Kelsen[2]*," The annulment of a law is legislative function, an act-so to speak-of negative legislation. A court which is competent to abolish laws-individually or generally-function as negative legislature".* Meanwhile, according to Siahaan[3] the Legislatives and the Presidents act as the positive legislature who creates the law.

Generally, Bagir Manan states that the efforts to renew the colonial law are not only limited by the formation of the constitutional regulations. Yet, it may also be done through the judge's verdict[4]. In that verdict also, this article aims to explain and to discuss the politics of the judicial law in the Constitutional Court's verdict in the process of creating law, especially those regarding health.

## Discussion

In general, the Politics of Law's definition according to experts and specialists is substantively and basically the same. According to Moh. Mahfud MD[5], politics of law is legal policy or formal line (policy) concerning health law which will be enacted by formulating a new law or by replacing the old law, in order to achieve the State's goals. From several existing definitions, the core of Politics of Law's definition is legal and health policy that will or has been nationally implemented by the Indonesian government. That is namely: *first,* a legal development in which its main point is making and updating the legal materials so that they can meet the needs; *second,* the implementation of the existing health legal provision, including the affirmation of the institution and the guidance functions by the law enforcers. From these definitions, it showed that politics of law encompasses the process of legal making and legal implementation that can indicate the nature and the direction in which health law will be established and enforced.

In its development, Politics of Law is not only made by legislators, namely it is made by the People' Representative Council and the President. It can also be carried out by the Constitutional Court as a judicial institution whose one of its authorities is to test the constitutionality of a constitution against the 1945 Constitution. The Constitutional Court's decision often determines in which direction the legislators must direct their legal politics.

In fact, it is not uncommon for the Constitutional Court to act as a positive legislature, because the Constitutional Court does not only state that a legal norm is contrary to the constitution so that it does not have binding legal force, but the Constitutional Court also takes the role of a law-maker because it participates in formulating new norm in its conditionally constitutional or conditional unconstitutional decisions. According to Stone, the Constitutional Court's involvement in the legislative process by formulating norm in its decision can also be referred to as judicialization of politics. The following is Stone's[6] full opinion.

"Judicialization of politics is the intervention of constitutional judges in legislative processes, establishing limits on law-making behavior, reconfiguring policy making environments, and sometimes, drafting the precise terms of legislations"

Therefore, the Constitutional Court must now be seen as a law-making body other than the President and the People's Representatives Council. According to Asshiddiqie[7], this is seen as a convergence between the legal systems. This is because, recently there is a strong tendency in the environment of countries that adopt the system of judge-made law to give a greater role to the

Constitution as in the civil law system. Conversely, in the civil law environment there is also a desire to enlarge the court's role as a law-making institution.

The Constitutional Court acts as a positive legislature. Because the Constitutional Court is involved in formulating new norm by making the interpretation so that the norm referred to does not conflict with the constitution. Morover, the Constitutional Court gives an interpretation of the health constitution when the rules in the constitution do not clearly regulate something in question or give orders to the legislator to revise the norms in a constitution until a certain time limit. If the legislator does not make the revision to a norm in a constitution as instructed in the decision of the Constitutional Court, then that norm directly becomes unconstitutional. The order in the decision of the Constitutional Court was termed by Paczolay[8] as a constitutional mandate. However, the term used by the author is judicial legal politics because the Constitutional Court has given directions of the national legal development which will be addressed.

On the other hand, based on Laksono's[9] research examining the decisions of the Constitutional Court from 2003-2015, there are several variants of the constitutional mandate contained in the Constitutional Court's decisions, they are as follows:

1. The Decision of the Constitutional Court that contains suggestion, recommendation, advice, or encouragement to make amendment, improvements, or formulation of the Constitution;

2. The Decision of the Constitutional Court that provides the alternatives normalization in formulating the Constitution;

3. The Decision of the Constitutional Court that contains prohibition to contain a certain norm;

4. The Decision of the Constitutional Court that must contain a specific norm in formulating Constitution;

In the rule of law perspective, disregarding judicial decisions is considered as a bad precedent. Law supremacy doctrine within the conception of the rule of law has obliged all parties to obey the judicial decision. Although there are some parties which argue, from the perspective of authority separation theory, the institution with authority to make laws is the parliament, therefore the judiciary may not function as a parliament. However, in the development of the idea of judicial review, it turns out that the function of the Constitutional Court is not only limited as negative legislature, but also functions as positive legislature. According to Stone, the involvement of the Constitutional Court in the legislative process by drafting norms in its decisions may be referred as judicialization of politics.

This matter is also in accordance with Asshiddiqie's opinion that currently, there is a tendency for countries which adopt civil law system to broaden the role of the judiciary in making laws. Conversely, in countries which adopt common law system, there is a tendency to give major roles to the law. This is also an indicator that the constitutional doctrine in one country always develops following the development of law and society.

Within the period 2013-2019, there were at least 26 times the testing of laws in health sector which included laws on health, laws on medical practice, laws on animal husbandry and animal health, laws on health personnel, hospital law. There are 6 (six) issues which are often disputed by their constitutionality according to Junaidi[10], namely:

1. Phrases regarding health caution;

2. Revocation of criminal sanctions for nurses who perform medical and pharmaceutical services;

3. Safeguarding the use of addictive substances so as not to interfere and endanger public health and public environment;

4. Provision of a designated space to smoke;

5. Health warning in cigarette production alongside with the sanctions;

6. Related to health financing sources originating from the government.

Below are several decisions which contain important guidelines which are considered by legislators in constructing laws, particularly in the development of health law. The examples of the Constitutional Court verdicts where the application grants the Petitioner's and contains constitutional mandate, include:

1. Decision Number 4/PUU-V/2007 concerning the testing of Constitution Number 29 Number 2004 regarding Medical Practices. In this decision, the Constitutional Court stated that the provisions of criminal sanctions in Article 75 paragraph (1), Article 76, Article 79, letter a of the Medical Practices are contrary to the constitution. The Constitutional Court eradicated criminal sanctions and only applied a fine to doctors or dentists who practiced without having registration certificate and practice permit as stipulated in Article 75 paragraph (1) and Article 76 of the Constitution and the threat of imprisonment as regulated in Article 79 letter a Medical Practice Constitution. Within this decision, Constitutional Court also provides guidelines to legislators in regulating criminal sanctions, to uphold criminal law which is humanist and closely related to the code of ethics. Therefore, the provision of criminal sanctions has to uphold the following guidelines: (i) criminal threats may not be used to achieve any particular goal which fundamentally might be able to be achieved in other ways which are as effective yet with less suffering and loss, (ii) criminal threats may not be used if the side effects are more detrimental than the actions to be criminalized, (iii) criminal threats has to be rational, (iv) criminal threats has to maintain harmony between order, in accordance with law, and competence (order, legitimation, and competence), and (v) criminal threats has to maintain the equality between community protection, honesty, procedural justice. Thus, the provision of appropriate sanction for doctors or dentists who practice with neither registration certificate nor license to practice would be a fine sanction.

2. Decision Number 12/PUU-VIII/2010 concerning the testing of the Constitution Number 36 of 2009 regarding Health. In this decision, the Constitutional Court has revoked the provisions of Article 108 paragraph (1) of the Health Constitution regarding the elucidation of the following phrase "health personnel" which contained in the elucidation section of Article 108 paragraph (1) of the Health Constitution and enclose the definition of "health personnel" in Article 108 paragraph (1) of the Health Constitution instead. This means, the Constitutional Court has repositioned the norms from the elucidation into the Article 108 of the Health Constitution. Under its consideration, Constitutional Court stated that the placement of exclusion provisions in the Explanation is considered as an improper placement, because such provisions are also included in the category of normalization and are not supposed to merely be explained. Moreover, the normalization contained in the said elucidation may have implications for the imposition of criminal sanctions, despite the existence of said sanction provisions may be found in another article. Norms are supposed to be placed within the article. Exception provisions are highly limited as they do not provide neither protection to patients in emergency nor provide protection to health workers. The test begun when Misran, a nurse who was also the head of the Community Health Center (Puskesmas) and was assigned in a remote area in East Borneo in where no doctor and pharmacist felt disadvantaged by the enactment of Article 108 paragraph (1) of the Health Law and its explanation. With this provision, Misran, as both of the head of Puskesmas and a nurse was unable to optimally carry out their duties in providing health services to patients, notably when there are patients who need emergency measures as one of the impacts of the narrow definition of health personnel and be jotted down in the article instead of in the explanation. With the eradication of norm regarding who are referred to as health workers in the elucidation of Article 108 paragraph (1) of the Health Constitution, then was placed in the Article 108 paragraph (1) section has guaranteed legal certainty for health workers in providing optimal services to the community.

3. Decision Number 57/PUU-IX/2011 concerning Testing of Constitution Number 36 of 2009 concerning Health. In this decision, the Constitutional Court has revoked the phrase "may" in the Elucidation Article 115 paragraph (1) of the Health Constitution which states, "For several specific places such as workplaces, public places, and other places **may** provide designated area to smoke". Therefore, the provision of designated smoking areas at workplace, public places, and other places is no longer optional, but considered as a necessity.

From this provision, it can at least be concluded that the decision of the Constitutional Court was accounted for the making of a law. In other words, the Constitutional Court's decision should be an important source of law which has to be considered to form a national health law.

## Conclusion

The presence of the Constitutional Court after

the constitutional amendment has a significant role in striving to form a national health law. As the decision of Constitutional Court often contains judicial legal politics which has to be a ground rule for the legislators, which in this case are President and the House of Representatives. The decision of Constitutional Court has to be upheld in making a law related to health sector, thereby such laws will not contradict the constitution as the supreme law (the supreme law of the land).

**Ethical Clearence:** Yes.

**Conflict of Interest:** No

**Source of Funding : Authors**

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# Pattern of Fatal IntraAbdominal Injuries in Autopsy Cases- A 3 Year Retrospective Study

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## Abstract

**Introduction-** Abdominal trauma is an injury to abdomen and is a common presentation in the emergency room if it is caused by blunt force. According to WHO, in few years trauma will become the first or second leading cause of loss of productive years of life for both developed and developing countries. The most common cause of blunt abdominal trauma are road traffic accidents, fall from height, assaults, industrial accidents, etc.

**Objective-** To study the pattern and prevalence of abdominal injuries in relation to the various epidemiological factors.

**Materials and Method-** This retrospective study was conducted over a period of 3 years from January 2016 to December 2018. The total number of cases studied were 120 showing abdominal injuries. This study on medicolegal autopsies was carried out at mortuary of Jawaharlal Nehru Medical College, Belagavi, Karnataka.

**Results-** A total of 120 cases were included in this study who presented with blunt abdominal trauma. In our study males (83 cases) outnumbered females (37 cases) and majority of the cases were in age group of 21-30 years (38.3%). Most of the cases were from rural background (57.5%). Road traffic accidents (75.8%) were the most common reason behind the abdominal trauma. The most common cause of death was shock and haemorrhage (69.2%). Liver was involved in majority of the victims followed by spleen.

***Keywords-*** *Abdominal injuries, Blunt trauma, Road Traffic Accidents*

## Introduction

Abdominal trauma is an injury to abdomen and is a common presentation in the emergency room if it is caused by blunt force. The incidences of blunt abdominal trauma are increasing day by day due to the modern industrial era alongwith the development of automobiles. The trauma to abdomen usually occurs due to Road Traffic accidents, fall from height, assaults, industrial accidents, etc. Road Traffic Accident (RTA) is one among the top 5 causes of morbidity and mortality in South East Asian countries.[1] The fatality rate in road traffic accident in India is one of the highest in the world and reported to be 20 times more than that reported in developed countries.[2] The abdominal cavity contains the vital organs like liver, kidneys, spleen, stomach, small intestine, large intestine, etc and trauma to this region challenges the integrity as well as the viability of an individual. These injuries deserve more detailed thought process as many of these lesions are not immediately fatal and present difficult clinical problems for the surgeon to solve. The solid organs such as liver and spleen are more readily lacerated by blows as compared to hollow organs like stomach, intestine, etc. The most important reason for the increase in mortality and morbidity in such cases is either the delay in early diagnosis or misdiagnosis. The extent of blunt abdominal trauma is increasing at an

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alarming rate as increasing population is relying more on motor vehicles for the transportation. This study was conducted to study the pattern and frequency of intra abdominal injuries seen in autopsy cases with the blunt abdominal trauma.

## Materials and Method

This retrospective study was conducted over a period of 3 years from January 2016 to December 2018. The total number of cases studied were 120 showing abdominal injuries. This study on medicolegal autopsies was carried out at mortuary of Jawaharlal Nehru Medical College, Belagavi, Karnataka. The study included data regarding age, gender, cause of accident, type of victim in road traffic accident, cause of death and incidence of visceral injuries of abdomen. All observations were recorded in specially designed proforma for study. Data was collected and then analyzed to determine the results. Statistical analysis was done by using SPSS software version 25 and the results were calculated in percentages.

## Results

A total of 120 cases were included in this study who presented with blunt abdominal trauma. Since there is minimal bony protection for underlying organs, the abdomen is more vulnerable to fatal injuries. In our study males (83 cases) outnumbered females (37 cases) and majority of the cases were in age group of 21-30 years (38.3%) followed by 31-40 years (15.8%) as depicted in Table 1.

**Table 1- Distribution of cases according to age and sex**

| Age Group | Males | Females | Total no. of cases | Percentage |
|---|---|---|---|---|
| 0-10 | 1 | 1 | 2 | 1.7 |
| 11-20 | 7 | 4 | 11 | 9.2 |
| 21-30 | 34 | 12 | 46 | 38.3 |
| 31-40 | 11 | 8 | 19 | 15.8 |
| 41-50 | 12 | 6 | 18 | 15 |
| 51-60 | 13 | 4 | 17 | 14.2 |
| 61-70 | 3 | 1 | 4 | 3.3 |
| >70 | 2 | 1 | 3 | 2.5 |
| Total | 83 | 37 | 120 | 100 |

**Table 2- Distribution of cases according to Place of Residence**

| Place of Residence | Number of cases | Percentage |
|---|---|---|
| Rural | 69 | 57.5 |
| Urban | 51 | 42.5 |
| Total | 120 | 100 |

As depicted by Table 2, the majority of cases were from rural background (69 cases, 57.5%) as compared to urban background (51 cases, 42.5%).

**Table 3- Distribution of cases according to type of accident**

| Type of Accident | Number of cases | Percentage |
|---|---|---|
| Road Traffic Accidents | 91 | 75.8 |
| Fall from Height | 18 | 15 |
| Direct Impact of Blunt Object | 6 | 5 |
| Others | 5 | 4.2 |
| Total | 120 | 100 |

According to Table 3, the most common reason behind the abdominal trauma was road traffic accidents (91 cases, 75.8%) followed by fall from height (18 cases, 15%). 6 cases (5%) were due to direct impact of blunt object over the abdomen.

**Table 4- Distribution of cases according to type of victims in Road Traffic Accidents**

| Type of Victims in RTA | Number of cases | Percentage |
|---|---|---|
| Bike Rider | 35 | 38.5 |
| Pillion Rider | 29 | 31.8 |
| Pedestrian | 12 | 13.2 |
| Four wheeler | 11 | 12.1 |
| Cyclist | 4 | 4.4 |
| Total | 91 | 100 |

As depicted in Table 4, the majority of the victims in Road Traffic Accidents were bike riders (35 cases, 38.5%) followed by 29 cases of pillion riders (31.8%) and 12 cases of pedestrian (13.2%). 11 cases (12.1%) were occupant of four wheeler while 4 victims (4.4%) were cyclist.

**Table 5- Distribution of cases according to Cause of Death**

| Cause of Death | Number of Cases | Percentage |
|---|---|---|
| Shock and Haemorrhage | 83 | 69.2 |
| Septicaemia | 37 | 30.8 |
| Total | 120 | 100 |

Shock and haemorrhage was the most common cause of death seen in 83 cases (69.2%) as compared to 37 cases of septicaemia (30.8%) as depicted in Table 5.

**Table 6- Distribution of cases according to incidence of visceral injuries of abdomen**

| Visceral Injuries | Number of Cases | Percentage |
|---|---|---|
| Liver | 21 | 17.5 |
| Spleen | 18 | 15 |
| Kidney | 15 | 12.5 |
| Small Intestine | 10 | 8.3 |
| Stomach | 5 | 4.2 |
| Liver, Kidney | 15 | 12.5 |
| Liver, Spleen, Kidney | 13 | 10.8 |
| Liver, Spleen, Small Intestine | 12 | 10 |
| Spleen, Kidney | 11 | 9.2 |
| Total | 120 | 100 |

As depicted in Table 6, Liver was involved in majority of the victims (61 cases) followed by spleen (54 cases). Kidney was involved in 54 cases as compared to 22 cases of small intestine. 5 cases of stomach injury were also reported.

## Discussion

In our study, males (69.2%) predominated females (30.8%) which is similar to the studies conducted by Khajuria et al.[3] This could be due to the risk taking behavior of males and indulging in outdoor activities as they are the earning members of the family. This study has found that majority of the victims were in the age group 21-30 years (38.3%) followed by 31-40 years (15.8%) because of the fact that persons in this age groups have tendency to take unnecessary risk thereby subjecting themselves to danger of accidents and injuries. This observation is consistent with the studies conducted by Suresh et al.[4]

Most of the cases were from rural background (69 cases, 57.5%) as compared to urban background (51 cases, 42.5%) which is similar to the study conducted by Reddy et al.[5] This could be due to the reason of ignorance of road safety rules and traffic sense. In this study, the most common cause of abdominal trauma was road traffic accidents (91 cases, 75.8%) followed by fall from height (18 cases, 15%) which is consistent with the studies conducted by Panchal et al.[6] Among road traffic accidents, bike riders (38.5%) constituted maximum number of cases followed by pillion riders (31.8%). These results are similar to the studies conducted by Gupta et al[7] and Norton et al.[8]

The most common cause of death in our study was shock and haemorrhage (69.2%) which is similar to the studies conducted by Ravindra et al.[9] Liver was involved in majority of the victims (61 cases) followed by spleen (54 cases). Kidney was involved in 54 cases as compared to 22 cases of small intestine. This observation is consistent with the studies conducted by Bakkannavar et al[10] and Maurice et al.[11] Among solid organs, liver was most affected as it is more anteriorly placed and hence more susceptible to injury by blunt trauma.

## Conclusion

In our study abdominal trauma is a major cause of mortality among young adult males of age group 21-30 years. Most of the cases were from rural background. Road Traffic Accidents were the most common cause of injuries followed by fall from height. Liver was involved in majority of the victims followed by spleen. The main cause of death was haemorrhagic shock due to multiple injuries. A thorough examination should be done in all road traffic accident cases as many of them show fatal visceral organ damage without external injury. In

order to help the authorities to plan better availability of health care on road, the offending agent in Road Traffic Accident should be identified. Awareness of road safety measures, proper attention towards accurate diagnosis and prompt treatment of the accident victim is the need of hour to bring down the mortality as well as the morbidity.

**Ethical Clearance-** Taken from Institutional Ethical Committee

**Conflict of Interest-** None

**Source of Funding-** Self

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# ARM Diagnosis with Distal Colostography on Anorectal Malformations

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## Abstract

**Background:** Anorectal Malformation (ARM) is a common congenital disorder and clinically recognizable, however, there has been no successful therapy. Establishment of ARM diagnostic is based on clinical and radiological of perineum USG, invertogram and distal colostography. A low-ARM handling requires an immediate post-natal repair and a high position requires a preliminary colostomy to prevent intestinal obstruction.

**Objectives:**To determine the establishment of ARM diagnosis with distal colostography, evaluate the ARM management, and its accompanying complications.

**Methods:** This study used secondary data that derived from medical records. Consecutive sampling obtained 38 medical records that fulfilled the inclusion criteria from July 2012 to June 2013. Then samples were analyzed statistically.

**Results:** The number of ARM referrals from other hospitals was 92.1%. The number of ARM which performed by preliminary colostomy was 89.5% and 26.5% of it was accompanied by complications. Based on the distal colostographic results, the number of high ARM location was 54.1% and the low location was 45.9%. The number of low-ARMwhich performed by preliminary colostomies was 88.2%. Twenty-eight subjects who had performed anorectoplasty obtained suitable colostographic results of 71.4% and unsuitable results of 28.6%.

**Conclusion:** Distal colostographic results obtained by high-ARM by 54.1% and low location by 45.9%. The number of low-ARM that has been performed of colostomy by 88.2%. The number of distal colostographic results that in accordance to the findings of anorectoplasty was 71.4% and unsuitable was 28.6%.

***Keywords:*** *Anorectal Malformation (ARM),ARM types, distal colostography, congenital disorder*

## Introduction

Anorectal malformation (ARM) is a congenital disorder of anal malformation and or rectum due to abnormal separation of urogenital structures with hindgut during early embryogenesis. The etiology of ARM is allegedly related to genetic and multifactorial mutations.[1, 2]

The incidence of AMR reached 1 per 2500-5000 of live births and increased annually (0.2-0.3% to 1.2% of all live births). The AMR incidence was also higher in developing countries. Naser reported that the incidence of AMR in Chile (2000) reached 1 case per 1,298 live births, it was allegedly related to high rates of birth, malnutrition and low antenatal care of pregnant women in the country[3].

Based on data at Surgery Department of Dr. Soetomo General Hospital Surabaya, there were 43 ARM cases which treated in surgery unit for a year (January-December 2012) and 99 cases of ARM have been performed surgery (colostomy, anorectal repair and colostomy stoma closure) in operating room of Dr. Soetomo General Hospital Surabaya for a year(July 2012 – June 2013).

The ARM diagnosis is based on clinical abnormalities of anus and fistula during anamnesis and perineal examination meanwhile, photo of X-ray prone cross-table lateral view and/or perineal ultrasound are used to determine the type of ARM whether in low or high position[1, 4, 5].

Treatment that given to low-ARM is immediate post-birth repair of the perineum, whereas the preliminary colostomy is performed in high-ARM to prevent intestinal obstruction. It also as a pathway for colostography in order to know precisely the location of the distal rectum and the fistel rektourinarius. This requires a pediatric surgeon for determining the surgical techniques, thus normal physiologic postoperative anus can be achieved[6-10].

Based on medical data survey of ARM patients who treated at child surgery unit of Dr. Soetomo General Hospital Surabaya (March-April 2013), it was found that >80% of MAR patients were referral from other hospitals and >50% of them had performed preliminary colostomy without distinguished whether low or high ARM. Moreover, there was also a prolonged delay of definitive repair (weeks to months) caused by physical limitation of the patients and hospital resources, thus it increased the risk of colostomy complications such as prolapse, infection, fistula, and other complications. The existing problems could be caused by the difference of ARM management in Dr. Soetomo General Hospital with literature findings, thus it could encourage the authors to determine the diagnosis of ARM based on distal colostography; and to evaluate the ARM management and its accompanying complications.

## Method

Subjects of this study were 38 data of patient medical record in Dr. Soetomo General Hospital Surabaya from July 2012 to June 2013. Consecutive sampling was conducted during the study period. Subjects were selected based on the inclusion criteria, such as all medical records of patients with Anorectal Malformations with completed and accessible data.

This study was a retrospective observational study which used secondary data from medical records. The study protocol was approved by Dr. Soetomo Teaching Hospital Surabaya Indonesia. Research data was analyzed with descriptive statistics, then it was displayed in tabular form.

## Results

ARM patients who fulfilled the inclusion criteria were 38 children consisted of 26 males (68.4%) and 12 females (31.6%). Patients aged ≤1 year were 9 children (23.7% ) and >1 year were 29 children (76.3%). The age range of patients was between 4 months-9 years 11 months with the mean age of 2 years 8 months. We found 35 ARM referral patients from other hospitals outside Dr. Soetomo General Hospital (92.1%) and 3 ARM patients from Dr. Soetomo General Hospital Surabaya(7.9%).

ARM patients who have performed preliminary colostomy were 34 children (89.5%) and 4 children without preliminary colostomy (10.5%). ARM patient with preliminary colostomy and complications was 9 children (26.5%) and those with no complication were 25 children (73.5%). We obtained distal colostographic images of high-ARM by 20 children (54.1%) and low-ARM by 17 children (45.9%). In low-ARM, it was found that 15 children (88,2%) have performed preliminary colostomy and only 2 children (11,8%) were not performed with colostomy. Anorectal abnormality was found in colostography of 28 children, it was suitable with the anorectoplasty results of 20 children (71.4%) and an unsuitable results of 8 children (28.6%).

There were ARM patients with single disorder (Isolated MAR) of 24 children (63.2%) and ARM patients with other malformations of 14 children (36.8%).

**Table1 Distribution of Subjects by Sex, Age**

| Variable | Category | Frequency | Percentage |
|---|---|---|---|
| Sex | Male | 26 | 68.4 |
| | Female | 12 | 31.6 |
| | Total | 38 | 100.0 |
| Age | ≤ 1 year | 9 | 23.7 |
| | > 1 year | 29 | 76.3 |
| | Total | 38 | 100.0 |
| Origin of subjects | Other hospitals | 35 | 92.1 |
| | Dr. Soetomo General Hospital | 3 | 7.9 |
| | Total | 38 | 100.0 |

**Table 2. Distribution of ARM Patients**

| ARM Patients | Frequency | Percentage |
|---|---|---|
| have been performed preliminary colostomy | | |
| Preliminary colostomy | 34 | 89.5 |
| Without preliminary colostomy | 4 | 10.5 |
| Total | 38 | 100.0 |
| with Complications of Preliminary Colostomy | | |
| Complications | 9 | 26.5 |
| Without complication | 25 | 73.5 |
| Total | 34 | 100.0 |
| ARM Type Based on Distal Colostography | | |
| High | 20 | 54.1 |
| Low | 17 | 45.9 |
| Total | 37 | 100.0 |
| Anorectal Disorder Suitability of Colostography and Anorectoplasty | | |
| Suitable | 20 | 71.4 |
| Unsuitable | 8 | 28.6 |
| Total | 28 | 100.0 |
| Anorectal Disorder Suitability of Colostography and Anorectoplasty | | |
| Suitable | 20 | 71.4 |

***Cont...*** **Table1 Distribution of Subjects by Sex, Age**

| | | |
|---|---|---|
| Unsuitable | 8 | 28.6 |
| Total | 28 | 100.0 |
| low-ARM with Preliminary Colostomy | | |
| Preliminary Colostomy(+) | 15 | 88.2 |
| Preliminary Colostomy(-) | 2 | 11.8 |
| Total | 17 | 100.0 |
| Based on Other Comorbid Malformations | | |
| Isolated ARM | 24 | 63.2 |
| ARM accompanied with other malformations | 14 | 36.8 |
| Total | 38 | 100.0 |

## Discussion

Anorectal Malformation (ARM) patients were 38 children with age range of 4 months-9 years 11 months that consisted of 68.4% male and 31.6% female. This finding was similar to several previous studies [1, 11, 12] who reported that ARM incidence was more common in the male. The number of ARM referral patients from other hospitals outside Dr. Soetomo General Hospital Surabaya was 92.1% meanwhile, patients from Dr. Soetomo General Hospital Surabaya was 7.9%. This results showed the unequal distribution of competency-based child health services particularly in East Java due to the limited resources and facilities required in the diagnosis and treatment of ARM.

We obtained 89.5% of ARM patients who have been performed of preliminary colostomy (mostly performed in the original hospital) and 10.5% of patients without preliminary colostomy. This result was one of the causes of improper management of ARM in Dr. Soetomo General Hospital Surabaya. It was contrary to recommended therapy in the literature that indicated preliminary colostomy only on high-ARM and other special cases.

Indications of preliminary colostomy included the decompression needs in the emergence of neonatal intestinal obstruction. It enabled the colostography to be performed for further diagnosis of anorectal disorders and protect the pasca repair of a distal colorectal tract. ARM patients with preliminary colostomy and complications were found in 26.5% of patients and those with no complications were 73.5%. The most common complications were prolapse stoma, retraction stoma and fecaloma. Several causes of complications were the location of stomas in the transverse colon and the length of patient waiting time from the implementation of definitive repair to colon anastomosis due to availability of operating room and limited number of pediatric surgeons[13-15].

Distal colostographic results from this study obtained a high-ARM of 54.1% and a low-ARM of 45.9%. The most types of abnormalities were ARM with rectourethral fistula in male and rectovaginal fistula in the female, this was in accordance with the results of some previous studies[1,11]. There was 88.2% of low-ARM patients with the preliminary colostomy, these results indicated the need for an evaluation of preliminary indication of colostomy at low-ARM in Dr. Soetomo General Hospital Surabaya. It was due to the literature of low-ARM that suggested anorectal repair without preliminary colostomy. The anorectal abnormality was found in colostography of 28 children, it was suitable with the anorectoplasty results of 20 children (71.4%) and unsuitable results of 8 children (28.6%). These

results showed that colostography was a quite accurate examination to determine the location of the distal rectum while detecting the fistula that a surgeon needs in the selection of surgical techniques. The differences between the results of colostographic and anorectoplasty might be due to improper colostography techniques, less experienced radiology officers and the presence of fecalomas that block contrast to achieve the distal rectum and fistula.

The number of Isolated ARM patients obtained in this study was 63.2% and patients with other malformations were 36.8%. This result was different from previous studies that reported ARM incidence with other malformations was 45% and 66% [11, 12]. This was due to the domination of low-ARM in this study meanwhile some studies mentioned that co-morbid malformations were more commonly found in high-ARM [12]. Other comorbid malformations found in this study were congenital heart defects, spina bifida with myelocele and down syndrome.

## Conclusion

Distal colostographic results in Dr. Soetomo General Hospital Surabaya obtained high ARM of 20 children (54.1%) and low-ARM of 17 children (45.9%). The number of low-ARM who has performed the preliminary colostomy was 15 children (88.2%). The number of anorectal disorder in distal colostography that was in accordance to the findings on anorectoplasty was 20 children (71.4%) and unsuitable results was 8 children (28.6%).

**Conflict of Interest:** There is no conflict of interest in this research

**Source of Funding:** This is research use individual funding

**Ethical Clearance:** This research have ethical clearance from faculy of medicine Universitas Airlangga

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# Multiplanner Measurement to the Clicked Tempromandibular Joint (Condylar Process and Articular Dick) with Conbeam Computed Tomography

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## Abstract

Background: The purpose of the current study was to actualization, the relationship of condyle-fossa position, in clinically symptomatic untreated in first dental special center in baquba, and by cone-beam computed tomography (CBCT). Objectives: Cone-beam computed tomography was superior to conventional radiography and conventional tomography for estimating internal disorders of temporomandibular joint. Cone-beam computed tomography demonstrated excellent evaluation of bony structures. Methods: fifty patients were examined in this study. Temporomandibular Joint with cone-beam computed tomography of the patients. Width and shape of glenoid fossa, width and shape of condyle, symptoms of the patient, soft tissue and clicking in both the right and left TMJs were measured. Data were analyzed using ANOVA test. Results: A statistically significant differences in the position right and left condyles were found among the patients that complete edentulous, partial edentulous, and fully erupted teeth. In patients, significant statistical differences were found between right and left TMJs in both values the X axis and the Y axis values. The difference between the right and the left X axis values in patients was also statistically significant. Conclusion: Cone-beam computed tomography is most commonly used in oral and maxillofacial surgery, implant dentistry and orthodontics. Cone-beam computed tomography examination not accepted unless its medical necessity is established and the benefits superimposes the risks.

***Key Words:*** *mandibular condyle, glenoid fossa, Temporomandibular joint*

## Introduction

Pain related to the temporomandibular joint (TMJ) was mutual in the most population. Only about 3%-7% of the patients with pain linked to TMJ disorder and seek to the medical care [1,2]. Although TMJ disorders or dysfunctions were the most popular clinical conditions that refer to the imaging examination, pathologies that specific to the bone and the joints also common. Cone-beam computed tomography was the most widely technique of choice that used for diagnostic. Cone-beam computed tomography (CBCT) is a new medical imaging technique that creates 3-D images at a lower absorbed dose and cost comparing with conventional computed tomography (CT). This imaging technique based on a X-ray beam with cone-shaped that concentrated on a 2-D detector that achieves by one rotation around the object, and produced a series of 2-D images [3]. These images are re-constructed in 3-D using a modification developed by Feldkamp *et al.* in 1984 that modified original cone-beam algorithm. Craniofacial region images were often collected with a advanced resolution than those collected with a conventional CT. In addition, the new systems were more practical, due to come in smaller sizes [2]. Considerably TMJ underdeveloped at birth in comparison to other diarthrodial joints making it more exhibit to perinatal and postnatal abuses. TMJ has an articular surfaces, disk, synovial fluid, fibrous capsule, synovial membrane, and ligaments. TMJ are comprises from mandibular condyle inferiorly and the glenoid fossa superiorly and articular eminence of the temporal bone[3].

The mandibular condyle appearance was awfully variable between patients and in different age groups. The cranial component of the TMJ lies beneath the

squamous portion of the temporal bone anterior to tympanic plate [4]. The articular fossa was formed entirely by the squamous portion of the temporal bone. Along the medial aspect of the glenoid fossa was the petrotympanic fissure anteriorly and the petrosquamous fissure posteriorly. The articular eminence (AE) forms the anterior boundary of the glenoid fossa [5]. The AE is a transverse bony bar anterior to the glenoid fossa and medial to the posterior margin of the zygomatic process. The articular disk was biconcave, round or oval, avascular fibrocartilage located between the condyle and glenoid fossa. The disk was significantly thinner centrally in the intermediate zone [6]. Instead, the disk is firmly attached to the medial and lateral poles of the mandibular condyle. This allows simultaneous movements of the disk and the condyle. The muscles of mastication (medial and lateral pterygoids, masseter, and temporalis) in addition to other accessory muscles help opening and closing of the jaw [4,6].

**Biomechanics of TMJ movements**

Jaw movement comprises the high level of coordination and interaction between bilateral mandibular condyles, muscles, disk, and ligaments of the joints [7]. The functional interactions within the TMJ are complex and incompletely understood [8, 9]. A basic view of the complex interactions in open and closed mouth positions was describe, in a normal joint, the thin intermediate zone of the disk always interrupted between the condyle and the temporal bone in both the closed-mouth and open-mouth situations, for prevention articular damage. In the closed position of the mouth, the condyle fixed in the glenoid fossa. The disk was interposed between the glenoid fossa superiorly and the condyle inferiorly. The articular eminence located anterior to the articular disk. The normal disk positioned in front of the condyle and the junction of the posterior band and bilaminar zone located immediately superior to the condylar head near the 12 o'clock position [1, 3,4,9,10-11]. However, some controversy exists over the range of normal position of the disk [1, 3, 4, 11-12]. The junction of the posterior band and bilaminar zone should located within 10 degree of vertical to be within 95 percentile of normal. There was significant relationship variation of the posterior band and bilaminar zone in normal people, resulting in incongruous classification the displacement of the anterior disk [13, 14]. Rammelsberg et al [15] proposed the disk positions of up to +30° from the vertical be considered normal. Many other authors have suggested that the intermediate zone be the point of reference so that in a normal joint it was interposed between the condyle and the temporal bone in all joint positions [16, 17]. Comparing to the different disk positions of 12, 11 and 10 o'clock, and establish the intermediate zone criterion for disk displacement to be more stringent. Recently [17] have proposed parallel conclusions the inferior belly alternately contracts, this produces lateral movement of the jaw.

**Imaging techniques**

CMCT is suitable to assess the bony elements of the TMJ. CT is perfect to evaluation the fractures, erosions, infection, degenerative changes, invasion by tumor, as well as most bony congenital anomalies [18]. A typical imaging protocol is: 120 kV, 100 mA, 1 mm collimation, 1 mm/rotation (pitch), and imaged with a closed mouth[18]. CT is principally done when the suspicion of bony involvement from the MRI and if primary bony pathologies were suspected clinically. Cognate advantages of CBCT over MRI include, fascinating bone details and 3D evaluation of congenital, traumatic, pathological and postsurgical conditions.

## Materials and Method

A hundred patient were identified by gender, age, were used in this study. To undertake the measurements 10 linear distances were selected in the maxilla and mandible. The selected lines were orientated vertically, horizontally, and obliquely to account for linear measurements made in all three dimensions [8]. The gold standard was obtained for each of the 10 lines by physical measurements using a digital caliper with an accuracy of 0.01 mm (Gamma, Amsterdam, and the Netherlands). The physical measurements were repeated twice by three independent observers. The normal disc position of the 100 subjects was confirmed by history, clinical examination and cone-beam computed tomography (CBCT) [9]. Then, the images of the TMJ of the subjects were taken using CBCT to evaluate the optimal Shape of the condylar and fossa.

## Statistical Analysis

The gold standard accuracy of the selected distances was established by averaging the physical measurements

of the three observers (double blind examination). The mean of each measurement for each image type was compared with the mean of the gold standard using analysis of variance of repeated measurements. The significance level was set to $P \leq 0.05$. Corresponding image types were measured for all scan positions to minimized interaction with the statistical results. ANOVA test were used for each measurement to evaluate the average differences between the right and left side for each element of the sample [6].

## Results

The measurements were processed and analyzed using SPSS 20.0. For all values of the variables, the mean and standard deviation were reckon, based on patient's gender, ratios of male to female, shape of condyles (Table 1, 2, 3,4 and 5). The distribution of quantitative variables (condylar shape, condylar fossa) was measured for normality using the Shapiro-Wilk test before analysis. The ANOVA test was used where appropriate to examine the difference in mean between gender (male and female). P-values was determine the difference between the right and left sides of the mandible.

**Statistical data for the result:**

The results in table (1) show the percentage of males to female.

**Table (1) ratios of male to female**

| Male | Female |
|---|---|
| 68% | 32% |

However, revealed a significant difference between genders when shape of condyles and gleniod fossa were compared.

The ratios of the shape of condyles in left side of the males was showed high percentage of rounded shape of condyles in left side compared to other shapes as a 16% flat, 8% oval and 4% irregular shape. Nevertheless in the females the shape of the left condyle was estimate 12% oval shape, 10% rounded, 8% flat and 2% irregular shape.

The shape ratios of the condyles in right side of males was: irregular 0%, flat 20%, oval 4% and high [percentage of rounded 44% and in left side of the females: irregular 0%, flat 14%, oval 8% and rounded 10%, respectively as show in table (2).

**Table (2) show shape of condyles**

| | Male | | | | Female | | | |
|---|---|---|---|---|---|---|---|---|
| | **Irregular** | **Flat** | **Oval** | **Rounded** | **irregular** | **Flat** | **Oval** | **rounded** |
| Left | 4% | 16% | 8% | 40% | 2% | 8% | 12% | 10% |
| Right | 0 | 20% | 4% | 44% | 0 | 14% | 8% | 10% |

The ratios of the shape of glenoid fossa condyles in left side was in males irregular 4%, flat 26%, oval 6% and rounded 36% and in left side of the females irregular 0%, flat 8%, oval 6% and rounded 14%, respectively.

The ratios of the shape of condyles in right side was in males: irregular 6%, flat 20%, oval 20% and rounded 28% and in left side of the females: irregular 0%, flat 8%, oval 8% and rounded 10%, respectively as show in table (3).

**Table (3) show shape of gleniod fossa**

| | **Male** | | | | **Female** | | | |
|---|---|---|---|---|---|---|---|---|
| | **Irregular** | **Flat** | **Oval** | **Rounded** | **Irregular** | **Flat** | **Oval** | **rounded** |
| Left | 4% | 26% | 6% | 36% | 0 | 8% | 6% | 14% |
| Right | 6% | 20% | 20% | 28% | 0 | 8% | 8% | 10% |

There was significant difference between males and females when condylar shape and glenoid fossa was compared. In addition, the mean values of condylar shape in males were higher compared to females (Table 4).

**Table (4) statistical analysis of condylar shape.**

| **Variable** | **number** | **Mean** | **SE** | **Maximum** | **Minimum** | **P Value** |
|---|---|---|---|---|---|---|
| Left | 100 | 18.9 | ± 4.2165 | 23.1 | 14.9 | 0.04 |
| Right | 100 | 17.85 | ± 5.2765 | 24.5 | 14.4 | 0.03 |

The glenoid fossa shape of the left and right side of the mandible were showed, and the values were predisposes to statistical analysis include (mean, stander error, maximum, minimum and *P* Value) as show in (Table 5). P-values were used for each measurement to evaluate the average differences between the right and left side for each element of the sample.

The results showed significant difference among males and females in left side glenoid fossa but showed non-significant differance among males and females in right side glenoid fossa diminsion.

**Table (5) statistical analysis of glenoid fossa shape.**

| **Variable** | **number** | **Mean** | **SE** | **Maximum** | **Minimum** | **P Value** |
|---|---|---|---|---|---|---|
| Left | 100 | 22.5 | ± 5.7389 | 28.5 | 17.5 | 0.01 |
| Right | 100 | 22.1 | ± 4.9870 | 27 | 16.9 | 0.06 |

**Figure (1): CBCT picture of a normal TMJ**

## Discussion

Academy of Dento-Maxillo-Facial Radiology has developed the basic principles of CBCT uses of in dentistry [13]. CBCT examinations must not be carried out unless a necessary use have been performed and must be justified for each patient to reveal that the benefits outrun the risks. CBCT offer a choice of volume, sizes, and examinations must use the smallest and compatible with the clinical situation, if this offers a lower radiation dose to the patient [12] and the resolution compatible with an adequate diagnosis and the lowest achievable dose should be used.

The results showed highest percentage in patient that severing from clicking symptom in rounded shape condylar process and glenoid fossa in both left and right side and in both gender (males and females), comparing with other shapes of the two variables agree with [19]. These population that sever from clicking symptom with irregular shape showed lower ratio when comparing with other shape, but also showed uneven percentage between both flat and oval shape of condyle and glenoid fossa.

When comparing of two structure of TMJ showed, in males showed rounded shape left condyle represented about 40% and 36% rounded shape left glenoid fossa, this disproportion in the percentage of the shape of two structure cause difficulty in joint movement during opening and closing of the mouth agree with[20] round shape condyle represented higher percentage . While in irregular shape left condyle and glenoid fossa represented about 4% of patients that severing from clicking, this low percentage of patient that showed clicking during joint movement due to disharmony in the shape of two anatomical structure. Nevertheless oval shape of left condyle represented about 8% while the glenoid fossa represented about 6%. While the flat shape left condyle constitutes 16% while the left glenoid fossa that has flat shape constituted 26%. When examined the right side of all males showed the highest percentage represented by round shape of both anatomical structure. Round right condyle represented about 44%, while its glenoid fossa represented by 28% all patient. Nevertheless the second percentage of the patients that have flat shape condyle and glenoid fossa, that represented by 20%. While the other shape "oval and irregular showed different percentage "condyle 4%-0% and joint fossa 20%-6%) all these different percentage in different shapes of anatomical structure causes painful symptom like concurrent with joint clicking. In females also showed different shape of

condylar process and glenoid fossa when examined by CBCT and also the high percentage of the patient that have clicking in round shape joint structure agree with [20].

## Conclusion

CBCT is most frequently applied in oral and maxillofacial surgery, CBCT examination must not be carried out unless its medical necessity is proven. Large percentage of population had clicking with round shape condylar and glenoid fossa, and lower percentage had irregular shape TMJ unit Difference in the shape of TMJ units increase the risk of the clicking.

**Conflict of Interest**: None

**Funding:** Self

**Ethical Clearance:** Not required

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# Performance of the Health Cadres in Children's Growth and Development Monitoring Program after Training in the Working Area of Public Health Services of Abiansemal II, Badung, Bali

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## Abstract

Screening of growth in each child's routine is a occurrence of early developmental delay in children. However, often these activities could not be implemented due to lack of health human resources. Therefore, it needs to involve the active participation of communities, especially cadres health. Generally, this research aims at monitoring the program of growth and development of children after training. This research was conducted in the Public Health of Abiansemal II. Study population was all health cadres. The research was carried out by total sampling on each selected village health centers in the region. The study design is quasi-experimental methods (quasi-experimental research) with a model of one group pretest-posttest design. Instrument data collection using questionnaires and observation sheets. The statistics are using the Wilcoxon analysis (non-parametric). The results of the study noted that there were differences in the median pre-post knowledge (75 to 90, p value ≤ 0.0 5 ), attitude (72.7 to 80, p value ≤ 0.0 5 ), and skills (78 to 91.3, p value ≤ 0.0 5 ). This study concludes that an increase of of knowledge, attitudes and skills of health Cadres after training. Need to do the continuous training for health cadres and fully involving them in stimulating and early detection of growth and development of children .

***Keywords*** *: Early detection, growth, development, performance, cadre*

## Introduction

The era of globalization requires quality human resources, therefore children must be prepared in order to grow and develop optimally. An important period in child development is toddlerhood, because at this time the basic growth that will influence and determine further developments such as cognitive abilities, creativity, psychosocial, emotional, and behaviors that run very fast, in this period the parents' active role is very important[1].

The development of a child is the result of the interaction of various interrelated factors, namely genetic factors, the bio-physico-psycho-social environment, and behavior. Disruption of developmental delay is a serious problem for countries in the world[2]. In 2004 it was estimated that around 23% of children in the world experienced developmental disorders. In the United States, an estimated 12-16% of children experience developmental and behavioral disorders. Communication disorders and cognition disorders are part of developmental disorders that occur in about 8% of children. The number of toddlers in Indonesia is 10% of the population, with the prevalence (on average) of developmental disorders varying from 12.8% to 16% so that it is recommended to observe / growth screen for each child[3].

Delay of development is often too late to be known so that healing takes longer. The Indonesian Ministry of Health launched the Early Growth and Development Stimulation, Detection,Intervention Program (SDIDTK) for children 0-72 months. However, in implementation

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there are still obstacles so that this program cannot run as expected[4]. Study in Semarang City found that the SDIDTK program is not correctly disseminated, the supporting facilities were still inadequate and there was a lack of support from the Head of the public health[5].

A comprehensive and coordinated of SDIDTK program for toddlers can be carried out in the form of partnerships between families (parents, child caregivers and other family members), communities (cadres, community leaders, professional organizations, non-governmental organizations, etc.), with professionals (health, education, and social)[6]. Cadres have a very important role in society because they are health care workers who are in the midst of the community[7].

Interviews with officers at the public health of Abiansemal II said that the SDIDTK program in *Posyandu* is not well implemented even though visitors reaches 80%. This is due to the limited human resources who have the ability to carry out these activities. One of the efforts that can be done is by involving the active participation of health cadres who have been trained in SDIDTK. Generally the purpose of this study is find out the differences the performance of health cadres in the toddler growth and development monitoring program after training.

## Method

The research is quasi experimental research with one group pretest-post test design that is giving questionnaires before and after being given treatment[8]. The respondents were health cadres involving 50 respondents. Instrument data collection is used questionnaires and observation sheets. To ensure the consistency of the respondents' answers in the knowledge statement, the questions are arranged that are *favorable* and *unfavorable*, so that they are not always positive statements and are often the right answers[9]. Data analysis techniques include descriptive analysis, normality test data and Wilcoxon analysis.

## Results

Characteristics of respondents showed the highest age in respondents was> 35 years (56%), secondary education (54%), employment as a housewife (70%), number of children 2-3 people (80%), highest income > 3 million IDR (38%).

**Table 1: Respondents Characteristic**

| **KarakteristikCharacteristics** | **Responden (n=50)Respondents (n = 50)** | |
|---|---|---|
| | **nn** | **%%** |
| 1. Umur1. Age<br>< 20 tahun<20 years old<br>20-35tahun20-35 years<br>> 35tahun> 35 years old | <br>11<br>2121<br>2828 | <br>22.0<br>4242.0<br>5656.0 |
| 2. Pendidikan2. Education<br>DasarBasic<br>MenengahMiddle class<br>TinggiHigh | <br><br>1919<br>2727<br>44 | <br><br>3838.0<br>5454.0<br>88.0 |

***Cont...*** **Table 1: Respondents Characteristic**

| | | |
|---|---|---|
| 3. Pekerjaan3. Work<br>Tidak bekerja/IRTNot working<br>Wiraswastaentrepreneur<br>SwastaPrivate<br>PNSCivil servants | <br>3535<br>99<br>55<br>11 | <br>7070.0<br>1818.0<br>1010.0<br>22.0 |
| 4. Jumlah anak4. Number of children<br>1orang1 person<br>2-3orang2-3 people<br>≥ 4orang≥ 4 people | <br>99<br>4040<br>11 | <br>1818.0<br>8080.0<br>22.0 |
| 5. Pendapatan5. Income<br>Kurang dari 1.800.000,-/bulanLess than IDR 1.800.000/ month<br>IRp 1.800.001 s/d2.500.000,-/bulanIDR 1.800.001 to 2.500.000/ month<br>IRp2.500.001 s/d3.000.000 /bulanIDR 2.500.001 to 3.000.000/ month<br>Lebih dari Rp 3.000.000,-/bulanMore than IDR 3.000.000/month | <br>77<br>1515<br>99<br>1919 | <br>1414.0<br>3030.0<br>1818.0<br>3838.0 |

*Shapiro-Wilk* tests shows the three variables *p value* < 0.05, then continued with *Wilcoxon Test.*

The results showed that knowledge of the respondents before and after the training was 75 vs 90, while the value range before training was 55-90 and after treatment is 72- 100 (*p value ≤ 0.001)* . The median value of attitude before and after training was 72.7 vs 80, and the value range before training was 55-85 and after training 60-98 ( *p value ≤ 0.001*). The median value of skills before and after training was 78 vs 91.3, and the value range of skills before training was 55-85 and after training was 60-100 ( *p value ≤ 0.001*).

**Table 2 Differences in Knowledge, Attitudes and Skills of Health Cadres**

Before And After Training

| **IndikatorIndicator** | | **Descriptive** | | **ZWZW** | **NilaipP value** |
|---|---|---|---|---|---|
| | | **SebelumBefore** | **SesudahAfter** | | |
| Pengetahuan<br>Knowledge | Mean (SD)Mean+SD<br>MedianMedian<br>ModeMode<br>RentangRange | 71,9 (11,73)71.9+11.73<br>7575<br>8080<br>55-9055-90 | 87.96 (9,6)87.96+9.6<br>9090<br>9595<br>72-10072-100 | -6,06-6.06 | 0,000.00 |
| SikapAttitude | Mean (SD)Mean+SD<br>MedianMedian<br>ModeMode<br>RentangRange | 72,1 (7,17)72.1+7.17<br>72,772.7<br>6565<br>55-8555-85 | 81,7 (7,3)81.7+7.3<br>8080<br>7777<br>60-9860-98 | -6,09-6.09 | 0,000.00 |

***Cont...*** **Table 2 Differences in Knowledge, Attitudes and Skills of Health Cadres**

Before And After Training

| | | | | | |
|---|---|---|---|---|---|
| Keterampilan Skills | Mean (SD)Mean+SD<br>MedianMedian<br>ModeMode<br>RentangRange | 76,2 (4,99)76.2+4.99<br>7878<br>7878<br>55-8555-85 | 90,5 (7,78)90,5+7.78<br>91,391.3<br>100100<br>72-10072-100 | -6,09-6.09 | 0,000.00 |

*Description: ZW = Wilcoxon Test in pairs*

## Discussion

The level of knowledge of respondents varied, meaning that there was a difference in knowledge that was quite far between respondents. This condition occurs because of the varied information obtained by respondents regarding stimulation and early detection of developmental growth in children. Respondents also had not received health education about SDIDTK from both health workers and health institutions.

Based on the facts, even though health counseling has never been held about SDIDTK but there were five respondents who received a knowledge score of 85 at the time of the pretest. Apparently, the respondents knew about SDIDTK from electronic media (through browsing on the internet) and by reading health articles to stimulate and detect child growth and development. The source of information is one of the factors that can affect one's knowledge to broaden their horizons so that they can improve knowledge and ability[10].

The knowledge posttest shows median value of 90 with a standard deviation of 9.6 . The training carried out by the lecture method, audio visual media, modules can arouse the attention of health cadres to listen. Thus the information submitted can be received well and clearly by the respondents. Some respondents get a low value of knowledge due to low individual motivation factors both internal motivation and external motivation. This was revealed when the respondents stated that the activities to examine infants and toddlers were solely the duties of midwives. Mubarak (2007) states that motivation is a process of linkages between business and satisfaction of certain needs. Motivation is a process for achieving a goal[11].

The respondents were 56% are over 35 years of age which are middle adulthood periods. According to Werner in Hurlock (2002), achievement in middle adulthood is a positive picture of individuals. Individuals over 40 years of age generally have sufficient experience in education and association so that they have sufficient knowledge, definite attitudes and values about social development that are well developed[12].

Based on education, 54% of respondents attended high school. The respondent's education level can influence the respondent's knowledge after training so that there are differences in the results of the *pretest* and *posttest*. This result is reinforced by the theory by Irmayanti (2007) that educational factors influence one's knowledge so that the higher a person's education is the easier they are to receive information and the more knowledge they have[13].

The level of education of a person can influence the learning process in accepting new knowledge. The higher education, the easier the person receives information so that the more knowledge he has. Knowledge is very closely related to education where it is expected that someone with higher education will have more extensive knowledge[14].

The results of the pretest attitude, respondents obtained a median value of 72.7 with a standard deviation of 7.17. This indicates that respondents still consider stimulation and early detection activities not yet important and are carried out only when there is a disruption of child growth and development. This is because their knowledge is still lacking, so that readiness

and motivation to do stimulation and early detection of growth and development is also less. The posttest shows median value of 80 with a standard deviation of 7.3 . Value of respondent's attitude range after training 60-98. This attitude improvement was caused by cadres who had gained knowledge about SDIDTK toddler in training . Attitude is not always fixed, because attitudes can develop when they get positive and impressive influences from both inside and outside. The statement is in accordance with Wawan's theory (2010 that aspects of knowledge will determine a person's actions (practices), the more positive aspects of an object are known, the more positive attitudes toward the object will be generated. This means that the better the level of one's knowledge, the better the attitude or practice[15].

Personal experience factors is one of the main parts that influence attitudes so someone will experience that has been passed. Other people also influence a person's attitude who are considered important. As in Allport's theory that a person is determined by various various factors outside of a person play a role as determinants and even modifiers of behavior[16]. Extrinsic motivation has a role when individuals do something[17].

Based on some research results it can be concluded that knowledge influences the attitude of each person, if the person's knowledge is good then that person will have a positive attitude. Knowledge is an important component to form positive attitudes and behaviors[18]. Attitudes are very closely related to the level of knowledge[19]. The results obtained with the theory which how well one's knowledge of objects will determine their attitude towards the object. The higher a person's knowledge of an object is expected to produce the right attitude (positive) on the object[20].

The results of the pretest-posttest skills obtained a median value of 78 vs 91.3. This illustrates that respondents are able to learn and practice the skills given so as to achieve the expected goals. During the training use module, audio visual and also demonstrated. In accordance with Hamalik's research (2005), which states that the use of learning media at the learning orientation stage will greatly help the effectiveness of the learning process and the delivery of messages[21]. Knowledge from the results of not knowing to know, this happens after someone does sensing a particular object and the stimulus. Most human sensing is obtained through the eyes and ears, but the more the five senses are used in learning an object, the better and more knowledgeable in learning an object[18].

The research by Rahmat (2012) in Menden Village, Central Java shows that counseling can influence and increase one's knowledge to understand something, also influence attitudes and actions in an activity[22]. The change in skills from before and after training is also influenced by characteristic factors, such as age and parity. Most of the respondents are middle adulthood and have 2-3 children. This period is a period of establishment for individuals so that they will be able to play an active role in society and social life. They will spend more time sharing their experiences. Intellectual ability, problem solving and verbal abilities have almost no decrease in individuals in the middle adult period[12]. Majority of cadre jobs were housewives so they have free time to learn new skills. The average family income is IDR 2,800,000 so income of the respondent's family is above the UMR Regency of Badung[23].

The cadres mostly have children 2-3 people so that they have sufficient experience to care for children and have skill of SDIDTK well. SDIDTK can be carried out properly if the examiner can cooperate with his children and caregivers. They like to train themselves with new skills and enjoy sharing with the community. Nirwana, Utami IH, and Utami HN (2015) research in Malang shows cadres had dedicated themselves as health promoters in their villages and were very motivated to help other women to maintain their health, such as cervical cance desease[24]. It seems with study by Peter NA et al (2015) who examined *training* to health cadres in conducting the first pertologan on accidents in Africa. Cadres become competent and able to do help after training[25]. Similar research by Gutnik L (2016) in Malawi that training can increase competence of health cadres to conducting breast cancer screening to the community[26].

## Conclusion

There was an increase in knowledge, attitudes and skills of health cadres before and after training on SDIDTK . Knowledge with a median of 75 to 90 ( $p\ value \leq 0.05$ ) . The attitude with a median of 72.7 to 80 ( $p\ value \leq 0.05$ ) and Skills with a median of 78 to 91.3

( *p value* ≤ *0.05* ) .

Health workers, especially midwives may conduct ongoing training so that cadres always get refreshments and skills about SDIDTK. The policy holder of the Puskesmas is to increase the participation of health cadres to stimulate and detect child growth and development . hould have further research on training methods suitable for health cadres.

**Conflict of Interest**: All of the authors contributed to writing this paper and declare no conflict of interest.

**Etichal Clearence:** Ethical Clearance obtained from the Ethic Committee, Health Polytechnic of Denpasar, Ministry of Health of Indonesia and respondent assignment.

**Acknowledgment:** We would like to acknowledge the cooperation, commitment and kind support of the subjects. We would also like to thank Health Polytechnic of Denpasar, Ministry of Health of Indonesia and Public Health Services of Abiansemal II, Badung Regency, Bali Province, Indonesia.

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# The Effect of Re-unification Education on Empathy and Multicultural Competence of Nursing-College Students

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## Abstract

**Background**: South Korean society is increasingly multicultural. As the percentage of North Korean defectors, married immigrants, and foreign workers increases, nurses will encounter more patients (and their family members) from diverse cultural backgrounds, which can pose a substantial burden. There is also a need for multicultural education among young people generally in South Korea. The purpose of this study was to identify the effects of an educational program about re-unification on nursing student's empathy and multicultural competence.

**Method**: A six-session re-unification educational program was developed based on a cultural-competency model. It was implemented outside the regular nursing curriculum among first-year and second-year nursing students from September to October 2019. Data were collected from 65 students: 32 in the experimental group and 33 in the control group.

**Finding**: Multicultural "capacity" increased in the experimental group relative to the control group ($t=2.60$, $p<0.001$). The results indicate that re-unification education can build and strengthen the multicultural competence of nursing-college students.

**Conclusion**: This result can be an important part of preparation for re-unification, because these students will be the main providers of nursing care for the multicultural population at that time.

***Keywords**: Re-unification educational program, nursing-college students, multicultural competence, empathy*

## Introduction

South Korean society is becoming more multicultural. Already, North Korean defectors, married immigrants, and foreign workers make up more than 4% of the population[1]. As that percentage increase, nurses will encounter more patients (and their family members) from diverse cultural backgrounds, which can be a substantial burden on those nurses[2]. Existing evidence indicates a need for multicultural education among young people in South Korea. Many South Korean college students were found to have a negative attitude toward the provision of preferential benefits to North Korean defectors[3]. In addition, South Korean nursing students were found to have a very low "supportive attitude" toward North Korean defectors[4], nursing students' multicultural awareness of North Korean defectors was different from their awareness of other cultures[5]. This indicates that nursing students would benefit from a more positive awareness of North Korean defectors. There is room for education-based improvement with regard to these students' empathy and multicultural competence. Multicultural competence comprises perception, knowledge, and skills. Cultural awareness in particular is a key element of multicultural competence, and a previous study[6] indicated that competence including cultural awareness is related to the ability to be empathic. This is consistent with a need to increase both multicultural competence and the ability to be empathic among college students. To be empathic here comprises

taking an inclusive attitude to effectively synchronize feelings, in the interests of altruistic behavior[7]. It also includes taking an affirmative role to acquire the knowledge needed to integrate well with people of other cultures and to avoid or to end prejudice[8]. Looking forward toward potential re-unification of north and south, we see a need for education that begins with an understanding of North Korean people and society, as well as an understanding of North Korean defectors from a multicultural perspective[9]. With consensus on re-unification recognized as the most important factor in re-unification education[10], positive perceptions of North Korean defectors can be promoted, together with understanding of North Korea, which may contribute to the success of eventual re-unification. Bringing latent attitudes and feelings to light can increase empathy and multicultural competence. However, it is still difficult to find a program combining re-unification education with strategies for enhancing multicultural competence. We evaluated a re-unification educational program for nursing-college students. The program was developed based on a model of cultural competence, and its effects on the students' empathy and multicultural competence were measured.

## Study Objectives

The goal of this study was to examine the effect of a re-unification educational program on empathy and multicultural competence of nursing-college students. There were two hypotheses. **Hypothesis 1:** Multicultural competence will increase in the experimental group, i.e. the group receiving the re-unification education, relative to the control group. **Hypothesis 2:** Empathy will increase in the experimental group relative to the control group.

## Methods

### Study design

This was an experimental study. The two outcome variables (empathy and multicultural competence) were measured both before and after the intervention (the re-unification educational program) in both groups.

### Participants

The participants were first-year and second-year students at a nursing college in D city. To minimize any influence of students' motivation to participate in the program, the control group comprised students who were interested in the program but could not participate because of other academic commitments. After the end of the study, the control group was provided with the contents of the program in lectures abbreviated to two hours. The sample size was computed using G*power 3.1.9[11]. In a previous study of the effect of an educational program on multicultural competence[12], the effect size was 0.97. For the independent-sample t-test with an alpha level of 0.05, an effect size of 0.50, and a power of 0.85, the minimum number of students required for each group was 30. At the start of the study, 35 students were in the experimental group and 37 were in the control group, but 3 in the experimental group participated in only part of the program and 4 students in the control group withdrew their consent. Thus, for the final analyses n=32 for the experimental group and n=33 for the control group.

### Measurements

Empathy and multicultural competence were measured using structured self-report questionnaires. The questionnaire used before the program had 3 items asking about general characteristics, 28 items to measure empathy, and 28 items to measure cultural exchange capacity. The follow-up questionnaire included the same 56 items measuring empathy and multicultural competence

### Multicultural Competence

Multicultural competence was measured using the Korean-language version of the Cross-Cultural Competence Inventory (CCCI)[13, 14]. It is a 28-item measure of commitment, self-efficacy, and cultural empathy, using a 5-point Likert-type scale. Six of the question-items are negatively worded, so they must be reverse-scored. Higher total scores indicate greater capacity for cultural exchange (maximum score: 5). Coefficient α (internal-consistency reliability) was 0.84 in the baseline survey.

### Empathy

Empathy was measured using the Interpersonal Reactivity Index (IRI)[15]. It has 7 question-items measuring perspective taking, fantasy, empathic

concern, and personal distress, using a 5-point Likert-type scale. Nine of the question-items are negatively worded, so they must be reverse-scored. Higher total scores indicate greater empathy. Coefficient α was 0.74 in the baseline survey.

**Intervention: The re-unification educational program**

The intervention was a re-unification educational program that was implemented as an extracurricular activity. The program was based on a model of cultural competence[16]. Cultural competence is a synthesis of acquired knowledge and skills in cultural awareness, cultural knowledge, and cultural sensitivity. During the first session of the program, after the participants completed the questionnaires on cultural exchange and empathy, the content focused on understanding the backgrounds of other cultures, with emphasis on the basic idea of a single Korean people. The next part of the program comprised sessions two through four, and it focused on health, inequality, and education for North Koreans and defectors. During the fifth session, cultural sensitivity was promoted by helping the students learn how the Korean language is used differently by people in the north and in the south, and the students practiced communication in role play. The sixth and final session focused on planning and preparation for re-unification based on empathy and multicultural competence. There was one 60-minute session per week.

**Data Collection**

Data were collected from September through October 2019. The recruitment announcement was posted for two weeks on a bulletin board designated by the school. To students who indicated their interest in participating, the researcher explained the purpose of the study, the guarantee of anonymity, and the rights of participants. Students who could participate in all six sessions of the program were assigned to the experimental group, and those who had commitments that would prevent them from participating in all six sessions were assigned to the control group. After informed consent was obtained in writing, students in both groups completed the baseline questionnaire. The baseline questionnaire included the scale for measuring empathy and the scale for measuring the capacity for cultural exchange. On the questionnaire the students used a nickname rather than their actual name, and the questionnaires were collected using an opaque box. After the six weekly sessions, all students completed a follow-up questionnaire that included the same two scales again. The nickname used before was used again, and again the questionnaires were collected using an opaque box. After the follow-up data were collected, students in the control group received the contents of the program in two hours of lectures.

## Statistical Analysis

The data were analyzed using IBM SPSS 22.0 software. Baseline homogeneity of empathy and multicultural competence between the groups was tested using the independent-samples t-test. The *a priori* hypotheses regarding the effects of the program on empathy and on multicultural competence were tested using the before-after change in scores (independent-samples t-test).

## Findings

**Homogeneity of demographic characteristics between groups**

The two groups did not differ significantly with regard to age, gender, or year in school (Table 1).

**Table 1: Tests of baseline homogeneity of demographic characteristics between groups (n=65)**

| Characteristic | Division | Experimental group (n=32) | Control group (n=33) | t or χ2 | P |
|---|---|---|---|---|---|
| | | n(%) or M±SD | n(%) or M±SD | | |
| Age | | 20.47±0.84 | 19.94±1.35 | 1.90 | 0.063 |
| Gender | Men<br>Women | 4 (12.5%)<br>28 (87.5%) | 7 (21.2%)<br>26 (78.8%) | 0.88 | 0.349 |
| Year in school | First year<br>Second year | 11 (34.4%)<br>21 (65.6%) | 17 (51.5%)<br>16 (48.5%) | 1.95 | 0.163 |

Inter-group homogeneity of empathy and of multicultural competence at baseline. At baseline, the two groups did not differ significantly with regard to empathy or multicultural competence (Table 2).

**Table 2: Test of baseline homogeneity of dependent variables between groups (n=65)**

| Variable | Experimental group (n=32) | Control group (n=33) | t | p |
|---|---|---|---|---|
| | M±SD | M±SD | | |
| Multicultural competence | 3.50±0.35 | 3.49±0.34 | 0.03 | 0.980 |
| Empathy | 3.46±0.32 | 3.33±0.27 | 1.78 | 0.079 |

**Effect of the re-unification educational program on empathy and on multicultural competence** Table 3 shows the results of tests of hypothesis regarding the effects of the re-unification educational program on multicultural competence and on the ability to be empathic. **Hypothesis 1:** Multicultural competence increased by 0.20±0.24 points in the experimental group, but it decreased by 0.03±0.26 points in the control group ($t=2.60$, $p<0.001$). Therefore, hypothesis 1 was supported. **Hypothesis 2:** Empathy increased by 0.05±0.20 points in the experimental group, and it increased by 0.13±0.22 points in the control group ($t=-1.43$, $p=0.157$). Therefore, the second hypothesis was not supported.

**Table 3: Empathy and multicultural competence before and after re-unification education (n=65)**

| variable | group | Baseline | After the intervention | Pre-post difference | t | p |
|---|---|---|---|---|---|---|
| | | M±SD | M±SD | M±SD | | |
| Multicultural competence | Experimental group (n=32)<br>Control group (n=33) | 3.50±0.35<br>3.49±0.34 | 3.70±0.34<br>3.47±0.38 | 0.20±0.24<br>-0.03±0.26 | 2.60 | < 0.001 |
| Empathy | Experimental group (n=32)<br>Control group (n=33) | 3.46±0.32<br>3.33±0.27 | 3.51±0.33<br>3.46±0.26 | 0.05±0.20<br>0.13±0.22 | -1.43 | 0.157 |

## Discussion

Empathy and cultural competence are essential for high-quality nursing[13]. Re-unification education for multicultural competence may improve students' understanding of North Korean defectors. We investigated the effects of such education on nursing-college students' empathy and multicultural competence. At baseline, the average score on the scale measuring multicultural competence was 3.50. A very similar result, 3.48, was found in a study of 663 college students[5]. A very similar score, 3.55, was found in fourth-year college students[5], and in that study multicultural competence was higher in female college students than in their male counterparts. On the empathy scale, the average score was 3.39, which was slightly lower than the average score of 3.47 found previously[17] in a study of 201 nursing students. Research on larger numbers of students is needed to determine whether that difference is reproducible and, if so, whether it is due to, for example, the students' year in school. The results of this study support the hypothesis that the re-

unification educational program increased multicultural competence. This is consistent with the increase in multicultural competence in a study of another program for nursing-college students[13]. In at least one previous study[13], the program tested was included in the curriculum and lasted for 14 weeks. While in this study the six sessions were implemented as an extracurricular program, still the same effect was found. Therefore, the goal of promoting multicultural competence can be achieved at least to some extent through a short-term program that students are not required to attend. The re-unification educational program apparently had no effect on the students' empathy. Others[18] have found that multicultural nursing education based on team learning did have a positive effect on empathy. Their program differed from the one in this study in that it included direct contact with people of other cultures. Thus, future programs probably should include experiences such as exchange activities with North Korean defector nursing students[19,20] or special lectures given by North Korean defectors themselves. The program tested in this study was developed on the basis of a conceptual model of cultural competence, and it combined multicultural education with content aimed at increasing students' understanding of re-unification [21]. Another important point is that students who were not motivated to participate were not included in either group. While that minimized any influence of students' motivation to participate (because all students in both groups were motivated to participate), it also means that no conclusions can be drawn regarding students who were not motivated to participate. Therefore, future work should include large randomized controlled studies to test the potential effects of students' motivation to increase their empathy and their multicultural competence.

## Conclusion & Recommendations

This re-unification educational program can increase the multicultural competence of nursing students. Future research should include randomized controlled trials of larger numbers of students. Also, to increase empathy, the program should include direct multicultural experiences.

**Ethical Clearance:** Not required

**Source of Funding:** This study was done with support from the designation and development project for leading universities in unification education at Kangwon National University, in 2019.

**Conflicts of Interest:** None

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# Assessment of Health Status of Children with Cancer who Undergo Chemical Therapy

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## Abstract

Purpose sample of 65 parents to assess their children with cancer who undergo chemotherapy in Child Central Hospital / Al-Asscan / in Baghdad City to determine the psychological, physical, social and nutritional aspects from 25 /10/ 2016 to 24 /4 /2017. Information was collected through direct interview with parents and analyzed by application of descriptive statistical and Chi square.

Results of the study indicated that high percentages concerning to psychological aspect **(**Measures to treat anxiety); psychological aspect **(**prepare child to provide chemotherapy); social aspect **(** Provide Social support) and Nutritional aspect (Daily diet as recommended).There was no significant differences between health status according to their aspects.

Based on such results many studies may be recommended for standing on health status of children. Health education and awareness programs can be design on chemotherapy and needs of children's cancer to increase awareness of parents.

***Key words:*** *Health Status, Children with Cancer, Chemotherapy.*

## Introduction

*Cancer* defines as abnormal growth of cells that not control. The cells can spread by blood and lymph. There are many kinds of cancers [1]. Some of them have not stopping and spread into surround tissues .Cancer in children the same parts of body such as other populations. It can occur sudden, no early signs and symptoms, need to high rate of cure and dealing with carefully. Most common cancer in children is leukemia. Treatment of cancer that affect included surgery, radiation and chemotherapy therapy [2, 3].

Childhood cancer is mostly common and distributed under eighteen. Cancers are rare in children. Overall, incidence rates of them has different across the world [4]. Almost, children with cancer can survive and healthy lives. So, the children in low-income countries do not complete nursing care or treatment plans [5]. A report of IARC (2016) state that there are many of cancers in the world are diagnosed as a children cancer who under of nineteen of age annually [ 6].

Chemotherapy is effective drugs that used in treatment of cancer. The types of treatment of cancers in children depends on level of cancer stage, type and its spread of disease [7,8] patients with cancer and their parents have many of health problems when chemotherapy is receiving, it may be coordinated the treatment program through medical team.[9]. The responsibility of health team is to management of signs and symptoms, providing support when starting of diagnosis. Parents in hospital may receive counseling, education about management of side effect, providing treatment plans and support for psycho-social needs [10].

A program has improved medical care plans to children cancers. Such care can help children and their parents to identify clinical health, screening, investigations, problem's health and how to treat side effects [11] .World Health Organization acts as measures prevention of childhood cancer that promote national care plans and programs that can prevention, diagnosis and treatment measures [12] .

## Material and Method

A descriptive study which used an assessment approach was implemented o;n children in Al-Asscan Central Child/ in Baghdad City to assess of psychological, physical, social, and nutritional aspects of children with cancer who undergo chemotherapy and find out of relationships between demographic data with aspects of their health status from 25 /10/ 2016 to 24 /4 /2017.

Purposive selection of (65) parents and their children. Data was receiving through direct interview from the parents by using of a questionnaire tool that consist of six parts. Demographic data of the sample, aspects of psychological, Physical, social and nutritional. Validity of the questionnaire was determined through the 3 experts. Data was collected by personal interview and analyzed by application of frequencies, percentages and Chi square.

## Findings

**Table 1: Distribution of parents and their children according to demographic characteristics**

| **Variables** | **Frequency (F)**<br>**65** | **Percentage (%)**<br>**100** |
|---|---|---|
| Gender<br>parents / Mothers (most)<br>children / Giles (most) | <br>53<br>39 | <br>81.5<br>60 |
| Age<br>Parents / 30-40 years (most)<br>Children / More than 3 years (most) | <br>33<br>32 | <br>50.8<br>39,3 |
| Education Status<br>parents /Intermediate School ( most) | <br>25 | <br>38.5 |
| Employment Status<br>Un Employment (both parents) | <br>47 | <br>72.3 |
| Duration in Hospital<br>Less than 3 months (most) | <br>43 | <br>66,1 |
| Type of disease<br>Leukemia | <br>35 | <br>53,8 |

The finding indicated that majority of mothers (81.8 %), in years of 30-40 (50.8%) at Intermediate School 38.5%. High percentage of them was un Employment (72.3%). So, more than half of children was Giles (60%), more than 3 years (49.3%), almost of them 66.1% while hospitalized of 3 months (49.3%) with type of disease is Leukemia at (53.8%).

**Table 2: Assessment of psychological aspect of the sample**

| Items | Psychological aspect | | | | Total | % |
|---|---|---|---|---|---|---|
| | Yes | | No | | | |
| | F | % | F | % | | |
| Consultation services | 41 | 63.1 | 24 | 36.9 | 65 | 100 |
| Psychological support | 46 | 70.8 | 19 | 29.2 | 65 | 100 |
| Measures to treat anxiety | 48 | 73.8 | 17 | 26.2 | 65 | 100 |
| Measures to control stress | 38 | 58.5 | 27 | 41.5 | 65 | 100 |
| Help to problem solving approach | 39 | 60 | 26 | 40 | 65 | 100 |

P value 0.05 Chi square 0.233

This table indicated that high percentages of psychological aspect was **(**Measures to treat anxiety 73.8%) **.**

**Table 3: Assessment of physical aspect of the sample**

| Items | Physical aspect | | | | Total | % |
|---|---|---|---|---|---|---|
| | Yes | | No | | | |
| | F | % | F | % | | |
| prepare child to provide chemotherapy | 57 | 87.7 | 8 | 12.3 | 65 | 100 |
| Provide education before chemotherapy | 41 | 63.1 | 24 | 36.9 | 65 | 100 |
| provide care during chemotherapy | 39 | 60 | 26 | 40 | 65 | 100 |
| Provide education after chemotherapy | 48 | 73.8 | 17 | 26.2 | 65 | 100 |
| Offer medications as order | 52 | 80 | 13 | 20 | 65 | 100 |
| Medications are available | 53 | 81.6 | 12 | 18.4 | 65 | 100 |
| Child was better in hospital | 47 | 72.3 | 18 | 27.7 | 65 | 100 |
| Awareness about side effects of chemotherapy | 53 | 81.6 | 12 | 18.4 | 65 | 100 |
| Provide Nursing – medical care | 51 | 78.4 | 14 | 21.6 | 65 | 100 |
| Prepare child to Lab. Investigations and Procedures | 53 | 81.6 | 12 | 18.4 | 65 | 100 |

P value 0.05 Chi square 0.455

This table indicated that high percentages of psychological aspect was **(**prepare child to provide chemotherapy 87.7%) **.**

**Table 4: Assessment of social aspect and Nutritional aspect of the sample**

| Items | Social aspect | | | | Total | % |
|---|---|---|---|---|---|---|
| | Yes | | No | | | |
| | F | % | F | % | | |
| Family visits are found | 39 | 60 | 26 | 40 | 65 | 100 |
| Provide Social support | 48 | 73.8 | 17 | 26.2 | 65 | 100 |
| Role of child in their families | 21 | 32.3 | 44 | 67.7 | 65 | 100 |
| Have friends are play with him in hospital | 24 | 36.9 | 41 | 36.1 | 65 | 100 |
| Have social stigma due to disease | 31 | 47.6 | 34 | 52.4 | 65 | 100 |
| Have social activities | 21 | 32.4 | 44 | 67.6 | 65 | 100 |
| **Items** | **Nutritional aspect** | | | | **Total** | **%** |
| | **Yes** | | **No** | | | |
| | **F** | **%** | **F** | **%** | | |
| Provide 6 meals of diet | 37 | 56.9 | 28 | 43.1 | 65 | 100 |
| Diet is soft & balance | 34 | 52.4 | 31 | 47.6 | 65 | 100 |
| Daily diet as recommended | 41 | 63.1 | 24 | 36.9 | 65 | 100 |
| Receive diet before chemotherapy dose | 36 | 55.3 | 29 | 44.7 | 65 | 100 |
| Not nutritional problems due to disease | 27 | 41.6 | 38 | 58.4 | 65 | 100 |
| Diet is regular and contains water | 29 | 44.7 | 36 | 55.3 | 65 | 100 |

P value at 0.05 Chi square 0.991

This table indicated that high percentages of social aspect was (provide Social support 73.8%).so high percentage of Nutritional aspect was (Daily diet as recommended 60%)

## Discussion

Results in Table 1 agreed with statement of child care plans that including treatment, and observe of child to return a normal life. As well as; signs and symptoms of an infection and measurers to prevent infections disease)[13]. Also, parents of children must be providing information and suggestions to help when children with cancer know what to expect [14]. Results supported too through the leukemia in childhood account for twenty-nine percent of all cancers who under 14 of old in 2018[15,16].

Results in Table 2 supported with that the stress and anxiety was depending on their situation of children.

Anxiety may be highest level when a child and their parents was waiting for results of diagnosis or waiting treatment to start)[17]. Feelings of these aspects are mostly common in such people to these life change experience [18].

Results in Table 3 supported by results that explain of prepare and monitoring health of children allows health professionals to assess the impact health intervention and prevention programs and identify needs of children [19]. Parents of children need to parental tasks because they plays vital role when providing medical care and prepare child to chemotherapy. These procedures due to major source of anxiety and stress for both children and parents [20].

Results out of Table 4 agreed with the statement of Parents and both nurses and health professionals in hospitals should pay special attention in case of social support in order to offer access to different kinds of support to children with cancer [21]. Such children who receiving high psycho-social support tends to feel less anxiety[22].

Results in Table 5 indicated that high percentages of Nutritional aspect of the sample (Daily diet as recommended according to order 60%). This result agreed with statement of many kids undergoing cancer treatment tends to eat less and lose body of weight because their appetites are affected [23]. Such issues supported with the term of healthcare that may be ask questions about health diet, weight history, counseling and diet changes are made to improve the condition of patient's nutrition [24].

## Conclusion

The study concluded that there is disparities in assessment of health status of children who are infected with cancer and who are undergo to chemotherapy, but in general it is good for the living conditions of the challenges and pressure. Which confirmed its recommendations that health programs can be design on chemotherapy of cancer, side effects and children needs related to bio-psycho-social aspects and nutritional need to promote their health services.

**Conflict of Interest:** non

**Source of Finding-** self or other source: Self

**Ethical Clearance:** Formal approvals were made for the administration of the Central Child Hospital in order to meet the sample of the research. The parents were interviewed by the researcher and distributed questionnaires and observations of their children to assess their health status. The patient parents were cooperating with the researcher, not record any difficulties in this study.

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# Effects of Onion Extract on Hepar Histopatology in Alloxan-Induced Diabetic Rattus Novergicus

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## Abstract

This study was aimed to know the effect of giving shallot extract (*Allium ascalonicum L*) to histopathological feature of rat (*Rattus norvegicus*) liver induced by alloxan. Alloxan was intraperitoneally injected 120 mg/kg BW (single dose). A total of twenty male Wistar rats of three months old were used in the study. The rats were divided into five groups. 1) negative control group (K-) treated by CMC Na 0.5 %, 2) positive control group (K+) treated by metformin 45 mg/kg BW as a standard drug, 3) extract of *Allium ascalonicum* 250 mg/kg BW (P1), 4) extract of *Allium ascalonicum* 500 mg/kg BW (P2), 5) extract of *Allium ascalonicum* 750 mg/kg BW (P3). Rats were treated for 14 days. The data of this study were analyzed by Kruskal Wallis Test, then it continued by Mann-Whitney Test. The result of this study is *Allium ascalonicum* can improve the histopathological feature of rats liver induced by alloxan.

***Keyword:*** *Allium ascalonicum, alloxan, liver, Rattus norvegicus.*

## Introduction

Diabetes mellitus (DM) is a degenerative disease that continues to grow in Indonesia. The increasing prevalence of this disease is caused by people's lifestyles and eating patterns. Diabetes mellitus (DM) occurs due to decreased function of the pancreas to produce insulin or insulin receptors do not occur due to complications, whereas diabetes does not turn into glycogen and cannot enter cells[(1)]. Clinical manifestations include disorders of lipid metabolism, carbohydrates, and proteins which will then stimulate the condition of hyperglycemia. Then the condition of hyperglycemia will develop into diabetes mellitus[(2)].

In the treatment of diabetes, oral antidiabetic drugs may be useful for sufferers who are allergic to insulin or who do not use insulin injections. While its use must be understood, so there is conformity with the indications without causing hypoglycemia conditions. Therefore, experts develop a traditional treatment system for diabetes mellitus that is relatively safe by using ingredients from herbal plants[(3)].

One of the plants that can be used as an alternative is onion (Allium ascalonicum L). Onion are very beneficial for health because they are rich in antioxidants to inhibit free radicals[(4)]. The dominant flavonoid content in the onion tubers, especially quercetin, is thought to have a hypoglycemic effect and is beneficial for people with diabetes mellitus[(5)].

This study uses alloxan to induce the condition of diabetes mellitus. Giving alloxan can increase blood glucose levels, causing disruption of insulin production due to damage to pancreatic β cells. Disruption of glucose entry into cells results in high blood glucose levels[(6)]. This hyperglycemia condition can cause oxidative stress from several organs, including the liver, heart, brain, and skeletal muscles[(7)]. Oxidative stress can cause lipid metabolic reactions, proteins including enzymes, which can cause oxidative damage if it continues it can cause liver cell damage and death. This study aims to determine

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the effect of the onion extract (Allium ascalonicum L) on the histopathological picture of the liver of white rats (Rattus norvegicus) induced by alloxan.

## Material and Method

This research was conducted in February - March 2015 at four locations, namely the Experimental Animal Laboratory, Department of Basic Medicine, Faculty of Veterinary Medicine, making histopathological preparations of white rat liver (Rattus norvegicus) in the Diagnostic Center Building Dr.Soetomo General Hospital Surabaya, as well as observation and scoring of preparations histopathology in the Department of Veterinary Pathology, Faculty of Veterinary Medicine, Airlangga University.

This study used 20 white male Wistar rats divided into 5 treatment groups, each group containing 4 white rats. The treatments consisted of K-, K +, P1, P2, P3. On the first day, all white rats measured their blood glucose levels and then induced an alloxan dose of 18 mg / 150 grams BW intraperitoneally. Giving alloxan is done once on the first day of treatment. After four days of the alloxan induction process (to get a constant rise in blood glucose levels) then the blood glucose level was measured again. After an increase in blood glucose levels, in the K-group given 0.5% CMC Na, the K + group was given a dose of 45 mg/kg BW of metformin, while groups of P1, P2, P3 were given onion extract at a dose of 250 mg/kg BW, 500 mg/kg body weight, 750 mg/kg bodyweight for 14 days.

After the next stage of treatment is carried out euthanasia using chloroform, then performed surgery on white mice for liver organs. The liver is then fixed to a place containing a 10% BNF solution. Histopathological preparation using Haematoxylin Eosin (HE) staining. Examination of liver histopathology preparations using a 400 times magnification microscope on five different fields of view for each slide. Assessment criteria using the scoring method[8].

**Table 1 Scoring assessment of the degree of liver cell histopathology [8]**

| | Degeneration | Necrosis |
|---|---|---|
| None | 0 | 0 |
| Minimal (0-25%) | 1 | 1 |
| Mild (25-50%) | 2 | 2 |
| Moderate (50-75%) | 3 | 3 |
| Severe (75-100%) | 4 | 4 |

## Result

This study used 20 white rats which were divided into five treatment groups with four replications. Before being divided into treatment groups, all-white rats were induced by alloxan at a dose of 18 mg / 150 grams BW intraperitoneally. The results of the examination of blood glucose levels of alloxan-induced white mice 18 mg / 150 grams BB intraperitoneally showed an increase in blood glucose levels that exceeded the normal range. Examination of blood glucose levels of rats using the EasyTouch brand glucometer.

After the condition of hyperglycemia, the K-group was treated with 0.5% CMC Na 0.5 ml by giving once a day for 14 days orally. For the K + group treated with metformin at a dose of 45 mg/kg body weight by giving once a day for 14 days orally, while in the groups P1, P2 and P3 treated with shallots extract at a dose of 250 mg/kg body weight (P1), 500 mg/kg BW (P2), and 750 mg/kg BW (P3) by giving once a day for 14 days orally. Then data were analyzed with the SPSS using the Kruskal-Wallis test and if there were significant differences between treatment groups ($p < 0.05$), then continued with the Mann-Whitney test.

### 1. Liver cell degeneration

Microscopic observations of white rat liver cell degeneration showed no significant difference between treatment groups ($p > 0.05$). The statistical analysis of observations of liver cell degeneration can be seen in table 1.

**Table 2 Median values of liver cell degeneration**

| Treatment | Median |
|---|---|
| K- | 2.8000[a] |
| K+ | 2.0000[a] |
| P1 | 2.4000[a] |
| P2 | 2.3000[a] |
| P3 | 2.1000[a] |

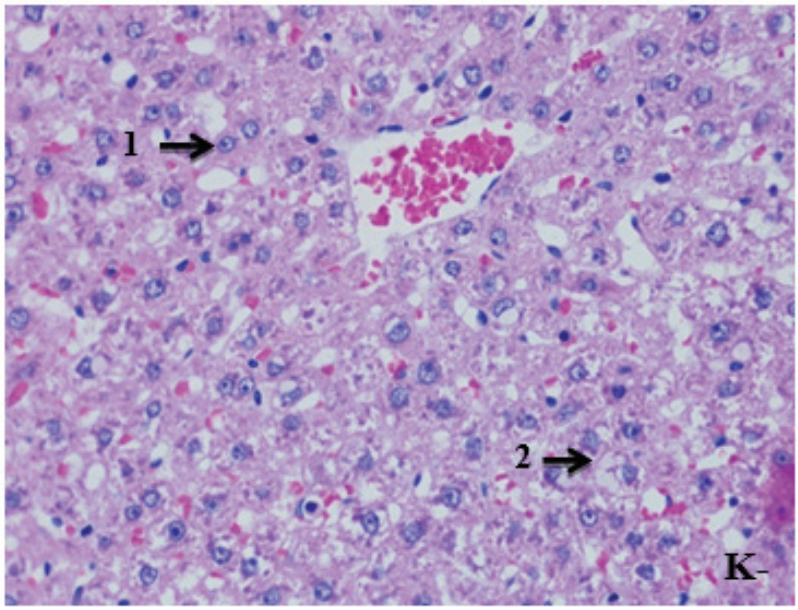


**Figure 1 Histopathology of liver cell degeneration in rat K-treated. (1) Normal liver cells. (2) The degenerated liver cells are seen to have swollen so that the cavity looks wider (HE staining; 400x magnification).**

In the K-group treated with alloxan and CMC Na 0.5%, the most severe degeneration occurred (2.8000), when compared to the K + group who were treated with alloxan and metformin 45 mg/kg BW degeneration occurred with a value (2.0000). Groups P1, P2 and P3 treated with alloxan and onion extract 250 mg / kg BW, 500 mg / kg BW and 750 mg / kg BW showed degeneration statistics with median values (2.4000), (2.3000) and (2.1000). The results show different figures for each treatment, but the Kruskal-Wallis statistical test did not show any significant difference ($p > 0.05$). Histopathological picture of liver cells in degenerated mice can be seen in the following figure.

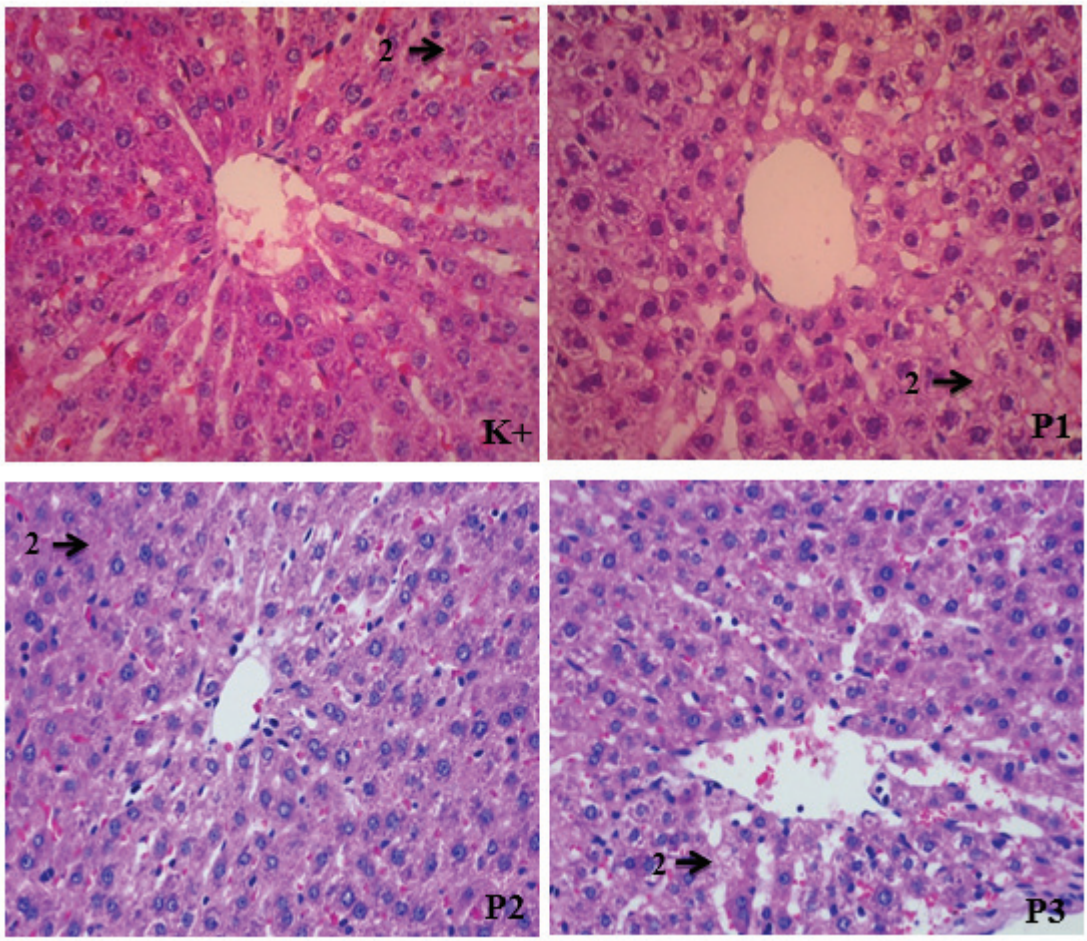


**Figure 2 Histopathology of rat liver cell degeneration treated with K +, P1, P2, P3. (2) The degenerated liver cells are seen to have swollen so that the cavity looks wider (HE staining; 400x magnification).**

### 2. Liver cell necrosis

Microscopic observations of white rat liver cell necrosis showed significant differences between treatment groups ($p < 0.05$). The statistical analysis of observations of liver cell necrosis can be seen in table 2.

**Table 2 Median values of liver cell necrosis**

| Perlakuan | Median |
|---|---|
| K- | 1.6000[a] |
| K+ | 1.4000[a] |
| P1 | 1.3000[a] |
| P2 | 1.0000[b] |
| P3 | 1.0000[b] |

Statistical analysis of the occurrence of liver cell necrosis in the K-, K +, and P1 groups were not significant differences in the three treatments. In the P2 and P3 groups, there were also no significant differences. However, the K-, K +, and P1 treatment groups showed significantly different results when compared to the P2 and P3 treatments seen from the superscript listed. Histopathological picture of liver cells of mice undergoing necrosis can be seen in the following figure.

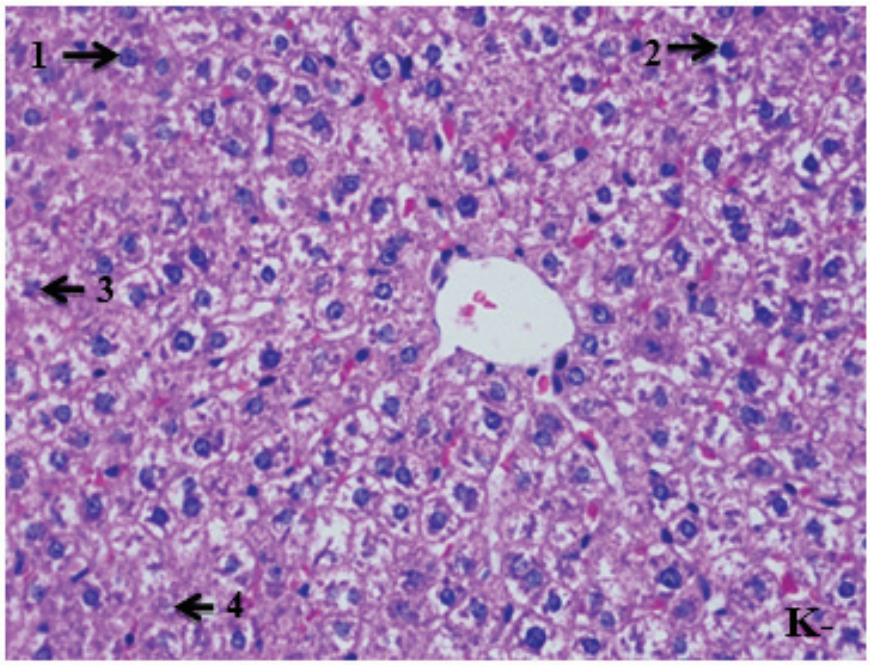


**Figure 3 Histopathology of liver cell necrosis in rat K-treated. (1) Normal liver cells. (2) Liver cells experience necrosis in the form of picnotics. (3) The nucleus of the liver cell experiences karyoreksis. (4) The nucleus of the liver undergoes cariolysis. (HE coloring) 400x magnification.**

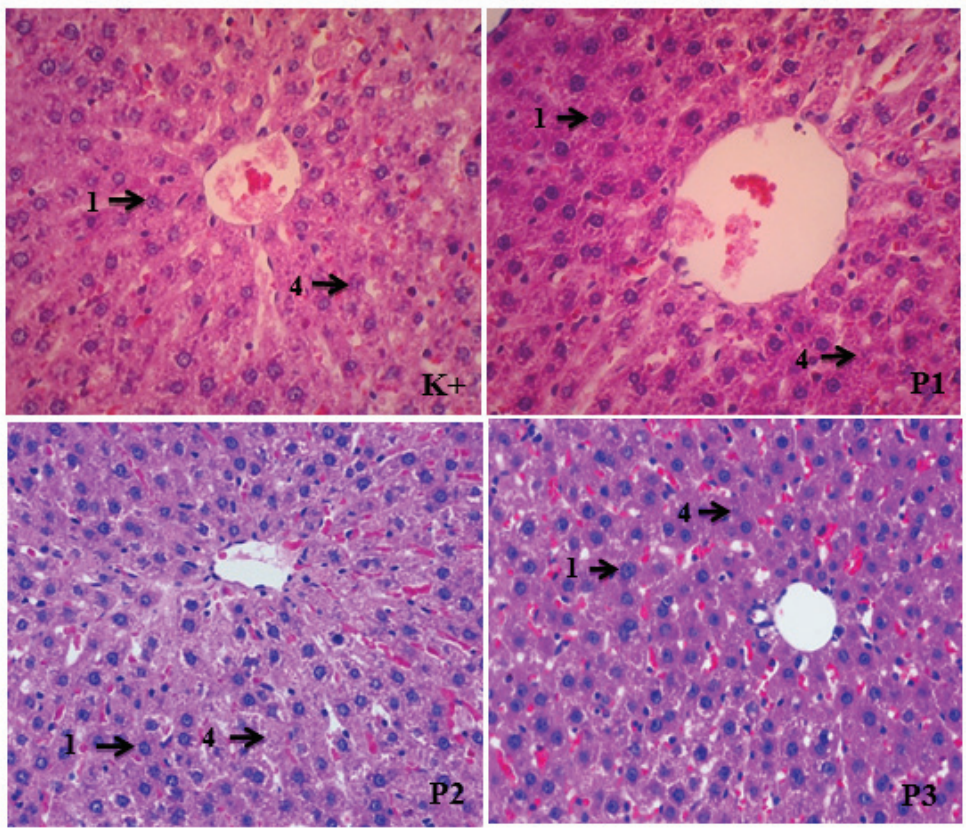


**Figure 4 Histopathology of rat liver cell necrosis with treatment K +, P1, P2, P3. (1) Normal liver cell nucleus. (4) The nucleus of the liver cell undergoes karyolysis. (HE coloring) 400x magnification.**

## Discussion

This research was conducted to see the effect of the onion extract (Allium ascalonicum L) on the histopathological picture of the liver of the white rat (Rattus norvegicus) induced by alloxan. Statistical results of the occurrence of liver cell degeneration showed no significant difference, while the occurrence of liver cell necrosis there were significant differences in each treatment. This is enough to prove that the onion extract plays a fairly good role in repairing liver cell damage due to alloxan induction.

Giving alloxan can increase the blood glucose levels of white mice that cause disruption of insulin production due to damage to pancreatic β cells. This compound can enter rapidly into pancreatic β cells and is reduced to dialuric acid which will then be oxidized back into alloxan which results in a redox cycle with the end result of radical peroxide compounds. This radical peroxide compound will undergo a process of dismutase to hydrogen peroxide. Hydrogen peroxide together with Fe2 + will form a reactive hydroxyl ($OH^-$) radical compound so that it can cause damage to pancreatic β cells. Disruption of glucose entry into cells results in high blood glucose levels[6].

This hyperglycemia condition can cause oxidative stress from several organs, including the liver, heart, brain, and skeletal muscles[7]. Oxidative stress can cause lipid metabolic reactions, proteins including enzymes, which can cause oxidative damage, if this continues it can cause liver damage and death. The liver functions in the process of biotransformation and detoxification of endogenous and exogenous substances that enter the body, and functions to filter blood from various organs that contain food, medicine, toxins, and bacteria. The state of diabetes will affect the occurrence of cell morphological changes from the liver[9].

### 1. Liver cell degeneration

Degeneration is a state of decreased intracellular biochemical changes accompanied by morphological changes due to nonfatal lesions in cells or as a cell reaction to lesions that are still reversible storage process or accumulation of fluids or other substances in cell organelles[10].

Based on the results of statistical analysis with the Kruskal Wallis test, there were no significant differences between the treatment groups ($p > 0.05$). In the K- (2.8000) treatment showed the most severe degeneration when compared to the K + (2.0000) treatment, this clearly happened because in the K (-) treatment no therapy was given and only 0.5% CMC Na was given which did not provide a therapeutic effect. in the liver, whereas in the K + treatment therapy is given with the drug metformin dose 45 mg/kg BW. Metformin is an oral anti-hyperglycemia biguanide class. Metformin works to reduce blood glucose levels by inhibiting hepatic glucose production (by reducing glycogenolysis and gluconeogenesis) and reducing insulin resistance especially in the liver and skeletal muscles[11].

In groups P1, P2, and P3 treated with onion extract doses of 250 mg / kg BW, 500 mg / kg BW, 750 mg / kg BW showed statistical results of median values (2.4000), (2.3000) and (2.1000). These data indicate that there was a decrease in the mean value of liver cell degeneration when compared to the K-treatment group which was only given CMC Na 0.5%. This means that onion extract can be an alternative therapeutic reference to improve the histopathological picture of the alloxan-induced liver. Onion has high phenolic phytochemicals. Recent research has reported that phenolic phytochemicals from onion have a blood glucose-lowering effect and high antioxidant activity in the alloxan-induced diabetic rat[12].

Shallots are believed to contain chemical components that have anti-inflammatory, anti-cholesterol effects, anticancer, and antioxidants such as quersetin[4]. There are studies that report that shallots contain high levels of quercetin, saponins, isorhamnetin and glycosides[13]. Most plants that contain bioactive compounds such as glycosides, alkaloids, terpenoids, flavonoids, and ceratenoid have antidiabetic activity. [14].

### 2. Liver cell necrosis

Necrosis is the death of liver cells. Dead cell nuclei can appear smaller, chromatin and reticular fibers multiply. The nucleus appears more dense and dark (picnotic) which can be broken or broken into several segments (karyoreksis) and then the cell nucleus is not visible because it has undergone perfect lysis (karyolysis) [15]. The mechanism of the occurrence of necrosis occurs

when tissue experiences hypoxia or the entry of a foreign body that is considered poisonous, the mitochondria will be injured, resulting in ATP down and Na + and K + pomp disturbed. Na + enters the cell which causes the lysosome to burst, releasing the hydrolytic enzyme so that it dissolves the cell[16].

Based on the results of statistical analysis with the Kruskal Wallis test showed that there were significant differences in each treatment group ($p < 0.05$) and continued with the Mann-Whitney test. In the group K- (CMC Na 0.5%), K + (metformin 45 mg / kg BW), and P1 (onion extract 250 mg / kg BW) there were no significant differences in the three treatments. In the P2 and P3 groups, there were also no significant differences. However, the treatment groups K-, K +, and P1 showed significantly different results when compared with treatments P2 and P3. The effect of decreasing the occurrence of different liver cell necrosis in each treatment may be influenced by different amounts of concentration at each dose of therapy.

Hepatocyte damage begins with changes in membrane permeability followed by cell death (necrosis). Increased enzymes in the blood caused by severe liver damage and accompanied by necrosis, so that enzymes from the mitochondria also come out of the cell[17].

## Conclusion

Based on the results of this study it can be concluded that the administration of onion extract (Allium ascalonicum L) can improve the histopathological picture of the liver of white rats (Rattus norvegicus) induced by alloxan.

**Conflict of Interest:** There is no conflict of interest to be declared**.**

**Source of Funding:** None

**Ethical Clearance:** This study was approved by the Faculty of Veterinary, Universitas Airlangga

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# Inclusive and Sustainable Healthcare Delivery-A Public Private Participatory Model

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## Abstract

Healthcare has become one of India's largest sectors with high income generation and employment opportunities. Indian Healthcare includes Public and private hospitals, clinics outsourcing, telemedicine, medical tourism, health insurance and other medical equipment. Public spending on public health and welfare in India are still not at the required level even after introduction of Ayushman Bharath. The gap between the actual spending by common man and the required amount is high in low-income which results in inter-state inequality in healthcare.

The aim of this paper is to analyze the public private participatory projects by Narayana Hrudayalaya and its CSR activities to reduce the problems faced by common Indian citizen in receiving good healthcare.

***Key Words:*** *Healthcare, public-private participation, out of pocket spending, underprivileged, Narayana Hrudayalaya, CSR activities.*

## Introduction

Good health is an important component of human development and improvement. Empowerment of people comes from the freedom from poverty, hunger, and malnutrition, and freedom to work and lead a healthy life.[1] Access to good healthcare is highly required for better development and empowering citizens. Government intervention in healthcare is highly recommended in world level to provide and regulate health services especially in developing countries as they have high income disparity between rich and poor and poverty.

Government spending for public health care in low and middle income countries is below than what is actually required. Low income generations and revenue collection and high demand for expenditure contribute to this gap in public health spending in these countries. Another problem is limited access to public health care facilities which forces common man to go to public health providers which increases out-of-pocket (OOP) spending, especially for the poor.[2]

Universal health care is providing access to key primitive, preventive, curative, and rehabilitative healthcare for all at an affordable cost. However, most low- and middle income countries find this a major challenge, as it requires substantial increases in public spending. Some middle income countries like Thailand, some Latin American countries China, Indonesia, and Vietnam, are focusing on improving access to healthcare.

In India there have been some recent initiatives to improve public spending on health care which resulted in some increase in access to good healthcare. The, National Rural Health Mission (NRHM), established in 2005, and the recent introduction of Rashtriya Swastya Bima Yojana (RSBY) and Ayushman Bharat Yojana launched in 2018 a national health insurance scheme for people below the poverty line are the two most important initiatives by the central government. Several state governments also have come up with their own insurance schemes. Despite such programs, the actual public spending on health is not at required level.

**The Critical Need for Health Care for Under Privileged**

Most rural and informal sector workers in the world do not have any form of health security. The labour sector of the Indian economy consists of roughly 487 million workers, the second largest after China. Of these over 94% works in unorganized enterprises ranging from pushcart vendors to home-based diamond and gem polishing operations.[3]

The poor are particularly vulnerable to the lack of health security. The poor spend a greater percentage of their income on health or related expenditures. In fact, healthcare costs are one of the primary reasons for rural indebtedness and poverty. Moreover, there is the issue of accessibility. Thus for many, simply accessing health care is by itself, an expensive proposition.

**PPP in Healthcare by Narayana Hrudayalaya**

'Low Cost Healthcare', an expression private hospital rarely speaks about these days. Nevertheless, there is one company, Narayana Hrudayalaya Limited, which has a mission to offer low cost health services to all the patients they can reach out to, in order improve the wellbeing of our nation. Corporate social responsibility is recent and an evolving concept for the business organizations in the country. NH CSR policy is a set of basic principles and guidelines to direct focus and influences the actions and decision-making towards providing necessary care and assistance to the needy through Public Private Participatory projects.

## Review of Literature

A literature review aims at reviewing current knowledge of theoretical and methodological contributions to a particular topic.

According to **Dr. A Venkat Raman and Dr James Warner** (2006) some issues at the policy level need in-depth analysis whether the government should directly propose and handle the PPP initiatives or whether it should create a specialized independent agency and provide incentives that encourage higher level of private sector involvement in provision of healthcare services.[4]

**Rustam Sengupta** (2013) in his book Sustainable and Inclusive Innovations in Health Care Delivery – A Business Model Perspective, found that the healthcare sector in India is undergoing a very good phase of progressive rapid growth. All healthcare providers are attracting investment in this sectors.[5]

Dr Jennifer Gill and Prof David Taylor (2013) of the UCL School of Pharmacy have suggested in their research Health and Health Care in India National opportunities, global impacts, that it is possible that the country's established expertise in areas like information technology and vaccine production will prove useful in recasting current models of self-care and professional care and opening the way to a unique and potentially world leading Indian health service model.[6]

Public Private Partnership (PPP) in Indian Health Care by **Dr. R Ramakrishnan** (2012) opined that PPP in healthcare is an instrument for improving health of the population. According to him medical sector is a national asset. Private and public sectors are very much accountable for overall health system of the country.[7]

**Govinda Rao and Mita Choudhury** (2012) said that it is the duty of central government to expand health infrastructure in both rural and urban areas of the country.

The above studies mainly focus on equitable distribution healthcare services, government intervention in providing healthcare finances, effectiveness of different public-private participatory projects and infrastructural developments in health sector.

**Research Design**

## Objectives of the Study

The main objectives of the study are:

1. To understand the role of government in healthcare financing.

2. To review the CSR activities of Narayana Hrudayalaya.

**3. To understand the public Private participatory projects of Narayana Hrudayalaya**

## Methodology

The paper is conceptual in nature and is adopted the descriptive research design. Primary data used in

the study is collected from patients using convenience sampling and secondary data obtained from reports of Narayana Hrudayalaya, official sites of Govt. of India and Govt of Karnataka, newspapers, books and journals

**Role of Government in financing healthcare**

Health care involves not only public spending by the government but also the activities of the private parties. Heath care commonly considered as a public good, but its demand and supply cannot be regulated solely by the invisible hands of the market.

Government should focus on

- Accessibility
- Fair distribution
- Availability to vulnerable groups and under privileged
- Expanding role of government in health care system

A public–private partnership (PPP) is a government service or private business venture which is funded and operated through a partnership of government and one or more private sector companies. These schemes are sometimes referred to as PPP, P3 or $P^3$. This is mainly done by the government sponsoring the private players to work in a particular field. The model has successfully worked in various other sectors like roads, airports, telecom, irrigation and etc.

CSR activities of Narayana Hrudayalaya

NH CSR policy directly focuses on providing necessary care and assistance to the needy. This policy is in accordance with the requirements set out in Section 135 of Companies Act 2013 read with Companies (Corporate Social Responsibility) Rules, 2014 notified by Central Government in this behalf.

NH aims to make a positive difference in the lives of the people by engaging in activities that eliminates or alleviates pain and suffering to the under privileged sections of the society.[8]

**NH CSR policy intends for:**

· Promoting healthcare facilities for the upliftment of people by providing affordable and accessible healthcare.

· Promoting educational facilities to help and assist talents of the children and amateurs.

· Strive for socio-economic development thereby reducing inequality between rich and poor.

NH CSR FOCUS AREAS

· Healthcare

· Enhancing livelihood

· Education

Narayana Hrudayalaya Public Private Participatory Projects

**Overview of projects/programs undertaken during Financial Year 2017-18**

· Rajiv Gandhi Arogya Yojana (RAY):

This program was initiated in November 2005 to develop a model of rural primary health care system in Amethi. The project currently includes 4 Primary Healthcare Clinics spread across four blocks of Amethi constituency and covers the basic healthcare needs of around 200 villages catering to a population of more than 60,000 people.

· **Railway Clinics:**

This program was initiated in July 2011 in the State of Karnataka in collaboration with Southern Railways. The objective is to provide timely care to the patients or accident victims in railway stations, and thereby curb the increasing number of deaths due to railway accidents.

· Mobile Mammography Screening:

The effort therefore, of the mammography screening program, has been to educate, screen, identify and refer patients for further treatment. In the past financial year, the program reached out to 7,000 women through 171 camps and 2,048 mammograms were conducted.

· Care Companion Program:

The Care Companion Program (CC Program) was first set up in 2013 in the NH Hospital in Mysore. This

program is designed to educate patient family members with low or no prior medical knowledge for attending to the needs of patients. Multi-lingual group teaching sessions use interactive videos for identifying warning signs of illness, checking temperature, pulse, blood pressure, timely medications etc.

· **E - Health Centre Program (eHCs):**

The program focuses on delivering quality and affordable primary health care to people living in resource-deprived locations of India using appropriate technologies. NH is the healthcare partner to implement, operate and manage eHealth Centres.

A Total of 9 eHealth Centres have been established in states of Karnataka, West Bengal, Rajasthan and Gujarat. A total footfall of 64,037 has been witnessed since inception.

· **Shorapur Maternal Obstetric Monitoring program**

Yadgir District has been identified by the Ministry of Health and Family Welfare as a High Priority District for the implementation of focused health care interventions under National Health Mission (NHM). Based on statistical data for maternal healthcare indices, it was decided to pilot maternal healthcare interventions in Shorapur Taluk of Yadgir District. NH team stationed in Shorapur co-ordinates free drives for Ultra sonography (USG), High Risk Pregnancy detection (HRP), as well as blood transfusion for anaemic pregnant women.

With implementation of this workflow innovation, there has been a 50% rise in detection of high risk pregnancy cases.

· **Udaan:**

According to the World Health Organization, India has seven doctors for every 10,000 people, half the global average. These shortages exist despite India having one of the largest medical education systems in the world. The unwillingness of doctors to work in rural areas is another challenge. Considering these twin challenges, the objective of Udaan is to nurture the potential of rural students from disadvantaged backgrounds and create a platform which they could leverage on towards realizing medical Education.

**New PPP Programs Initiated By Narayana Hrudayalaya**

· Community Radio program

Narayana Hrudayalaya Foundation was granted 90.4 spectrum wireless operating license in January 2017 for establishing a community radio station in Health city, Anekal. The community radio was named "Namma Nadi" with focus on health, education, environment, culture and civic issues within the primary and secondary zones of health city.

· **Non-Communicable Diseases (NCD) Program**

This new program was initiated in June 2017 with a focus to improve awareness and conduct screening for non-communicable diseases including breast and oral cancer. The program has been initiated at five locations – Mysore, Jamshedpur, Delhi, Howrah and Bangalore.

## Findings

· Inclusive and Sustainable healthcare system is a must for human resource development of any nation, which in turn increases the growth rate of the country.

· Proper institutional system within bureaucracy by the government and trained people is required for providing quality healthcare to common people.

· Proper PPP initiatives will work wonders in providing quality healthcare to masses.

· PPP is not a substitute for providing health services by the public sector through better governance.

· PPP initiate by Narayana Hrudayalaya through their CSR activities are mostly community model healthcare system which is a beacon of hope for providing healthcare services.

· NH model PPP are not only supporting the public healthcare system in Karnataka state, but also gives its support to other states like Rajasthan, West Bengal, UP etc.

· NH CSR activities focus not only on healthcare, but also supports livelihood enhancement and Education.

· NH PPP UDAN gives lifelong support for

talented poor students to achieve their dreams in higher education especially in the field of healthcare.

**Suggestions**

· The healthcare sector in India is undergoing a rapid change. Apart from the healthcare providers, other health industry contributors also should contribute to PPP projects.

· Government need to focus on providing health security provision to each and every individual with a highly innovative, affordable, and accessible health system.

· There is a need to reform or modify certain administrative systems and procedures.

· Policy makers should also try to establish global health care services market generating foreign exchange and driving its growth process.

· The main challenges on the field still are in terms of logistics, lack of awareness, government apathy and rudimentary delivery channels, measures must undertake by government to overcome these problems.

· Government has to focus on good health and wellbeing for all throughout their lives and should try to reduce the time lag in dispersing the fund to the people.

## Conclusion:

The Union Budget of 2018 introduced a healthcare project for common man; The National Health Protection Scheme (NHPS) is aimed at extending healthcare insurance to 100 million families and raising the insurance ceiling to 5 lakhs per family. The scheme would be a boost for Indian healthcare system.[9]

However, The World Health Organisation's ranking of health systems of countries; India is ranked at 112, way below countries like Bangladesh, Indonesia, Iran and Iraq. This low ranking shows India's low quality medical infrastructure and shortage of doctors. Private healthcare providers can fill the gap in the healthcare services by working with various developmental agencies and other institutions.[10] The transferability of schemes like this depend almost entirely public private participation and the existence of health care infrastructure of a reasonable kind. These projects will provide the country an inclusive and sustainable growth in health sector.

**Acknowledgment**: This research paper is made possible through the help and support from everyone, including: family, friends, and colleagues and in essence, all sentient beings. Especially, Dr.A.V.Chinnasamy, co-author and my research guide, Dr. R Venkatraman Dean Presidency Centre for Management Studies, NH management staff provided with their valuable support and advices.

**Conflict of Interest Statement**

The authors received moral support from Centre for Management Studies, Presidency College and Mother Teresa Women's University. The present paper has been reviewed and accepted as working paper by Presidency CMS. The authors also conduct research in the area of Health Economics and public spending.

**Source of Funding:** The research was a self-funded project.

**Ethical clearance Statement:** In undertaking this research various sources have been consulted in order to ensure that this study meets acceptable ethical guidelines. The paper is conceptual in nature and secondary data obtained from reports of Narayana Hrudayalaya, Bangalore and Asha Workers in Karnataka

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# Factors Analysis Related to the Completeness of Providing Basic Immunization in Infant Aged 12 Months

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## Abstract

**Background:** The highest number of children with incomplete immunizations in Indonesia is five provinces in Java. During 2015, diphtheria cases in Blitar District, East Java reached 44 cases. However, in 2016, there was an increase with the discovery of 49 infants affected by diphtheria and spread in several districts and obtained the number of 12-month-old infants who did not get complete immunizations of 47 infants.

**Aim:** The purpose of this study analyzed the factors related to the completeness of basic immunization for 12-month-old infants.

**Method:** This study was a quantitative study with cross sectional approach. The study was conducted on mothers who have 12-month-old infants by filling out the questionnaires about the relationship of independent variables, namely knowledge and attitudes of the mother, family support and health workers support as well as the dependent variable, namely the completeness of basic immunization. Total respondents were 46 people. Data were analyzed using the Chi Square test to determine the relationship between independent and dependent variables and logistic regression statistical tests to find out the dominant variables related to the completeness of basic immunization.

**Results:** There was a relationship between maternal knowledge (p = 0,000), maternal attitudes (p = 0,000), family support (p = 0,000), and health workers support (p = 0,000) and the completion of basic immunization. The dominant factor related to the completeness of basic immunization was knowledge.

**Conclusion:** Knowledge, attitude, family support, and health workers support have a significant relationship with the completion of basic immunization.

***Keywords:*** *immunization, knowledge, attitude, family support, health workers support*

## Introduction

Basic immunization is the provision of early immunization for infants up to one year old to reach immune levels above the protection threshold. It means that if one day exposed to the disease, they would not be sick or only experience mild illness. The purpose of immunization in general reduces morbidity, mortality, and disability due to disease that can be prevented by immunization (PD3I). In addition, other goals are the achievement of Universal Child Immunization (UCI) targets as determined, the elimination of PD3I such as tetanus, polio, measles, etc. and the implementation of safe immunization and management of medical waste (safety injection practice and waste disposal management)[1,2].

World Health Organization (WHO) in 2011 mentioned 10 facts of serious diseases which become a global burden; one of them is a disease that can be prevented by immunization (PD3I). WHO noted that there are still 18.7 billion infants who do not get basic immunization. The highest number of children with

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incomplete immunizations in Indonesia is five provinces on Java Island (55.3% of the national figure), namely East Java with 150,569 children, West Java with 180,788 children, Central Java with 199,030 children, Banten with 201,087 children and DKI Jakarta with 154,786 children[3–5].

One indicator of the immunization program success is the achievement of Universal Child Immunization (UCI). The achievement of UCI is a picture of immunization coverage in infants (0-11 months) nationally to the village level. WHO and UNICEF determined that immunization coverage indicator was 90% at the national level and 80% in all districts. In Indonesia, Basic Immunization is still 86.8% and Universal Child Immunization (UCI) is still 82.9%. Some disease outbreaks that occur in several provinces in Indonesia are caused by diseases that should be prevented by immunization. In recent years, there have been cases of "re-emerging disease" due to measles and diphtheria in several provinces in Indonesia[6].

The theory of Lawrence Green (1980) stated that a person's health is influenced by 2 main factors namely behavioral factors (behavior causes) and factors outside of behavior (non-behavior causes). A person's behavior factors are influenced by three factors, namely predisposing factors, enabling factors, and reinforcing factors. Predisposing factors consist of the level of knowledge, attitudes, education, perception, beliefs, socio-economic status, and age. The enabling factor consists of health service facilities that have the characteristics of availability, can be accessed, can be accepted, and can be reached. The last is the reinforcing factors consist of family support, health worker support, family support, health care support, and community figure support. The factors affecting health above need to be explored further, especially in relation to the completeness of basic immunization in infants aged 12 months[7,8].

## Method

This study was a quantitative research with analytical survey with cross sectional approach. The population in this study was mothers who had a 12-month-old infant in the working area of the Kademangan Health Center in Blitar, East Java, Indonesia. The sample was determined by calculating the formula, thus as many as 46 respondents were obtained. In this study, the sample was all mothers who have a 12-month-old infant with immunizations that was not on schedule.

Criteria for inclusion of respondents were: 1. Willing to be a research respondent, 2. Can read and write, and 3. Mothers who have babies aged 12 months. However, the respondents' exclusion criteria were: 1. Not willing to be a research respondent, 2. Cannot read and write, 3. Mothers who have infants over 12 months.

The study was conducted on mothers who have 12-month-old infants in the working area of the Kademangan Health Center in Blitar Regency with a questionnaire containing the relationship of mother's knowledge, mother's attitude, family support and support of health workers with the completion of basic immunization. Sampling was done by purposive sampling technique. The dependent variable in this study was the completeness of basic immunization for infants aged 12 months. The independent variables in this study were the factors that influence the completeness which consists of maternal knowledge, maternal attitude, family support, and health workers support. The results of the validity and reliability test on the results of the questionnaire revealed that all questions were valid and reliable. The next data was taken by visiting one by one respondent's house. The analysis in this study included unvaried analysis, bivariate analysis using the Chi Square test with a degree of significance $\alpha < 0.05$, and multivariate analysis.

## Result

### Respondent Characteristic

Table below showed the distribution respondent result based on age, last education, and job.

**Table 1 : Respondent Characteristic**

| **Respondent Characteristic** | **%** |
|---|---|
| Age | |
| 17-25 | 10,9 |
| 26-35 | 80,4 |
| 36-45 | 8,7 |
| Total | 100 |
| Last Education | |
| JHS | 71,7 |
| SHS | 26,1 |
| Freshgraduate | 2,2 |
| Total | 100 |
| Job | |
| House Wives | 89,1 |
| Farmer | 4,4 |
| Staff | 6,5 |
| Total | 6,7 |

Knowledge, Attitude, Family Support, Health Workers Support, and Completeness of providing Immunization Level

The level of some characteristic will explain in the below table.

**Table 2 : Knowledge, Attitude, Family Support, Health Workers Support, and Completeness of providing Immunization Level**

| **Measured Variables** | **Category** | **%** |
|---|---|---|
| Knowledge | Good | 52 |
| | Sufficient | 15 |
| | Less | 33 |
| Total | | 100 |
| Attitude | Negative | 43 |
| | Positive | 57 |
| Total | | 100 |
| Family Support | Get support | 67 |
| | Do not get support | 33 |
| Total | | 100 |
| Health Workers Support | Get Support | 61 |
| | Do not get support | 39 |
| Total | | 100 |
| Health Workers Support | Complete | 63 |
| | Incomplete | 37 |
| Total | | 100 |

**The Relationship between Knowledge and Completeness of providing basic Immunization**

There were relationship between maternal knowledge and the completeness of providing basic immunization in infants aged 12 months.

**Table 3 : The Relationship between Knowledge and Completeness of providing basic Immunization**

| Knowledge | Completeness of providing basic Immunization | | | | Total | | P value |
|---|---|---|---|---|---|---|---|
| | Complete | | Incomplete | | | | |
| | f(x) | % | f(x) | % | f(x) | % | |
| Good | 24 | 52,2 | 0 | 0 | 24 | 52,2 | 0.000 |
| Enough | 4 | 8,7 | 3 | 6,5 | 7 | 15,2 | |
| Less | 1 | 2,2 | 14 | 30,4 | 15 | 32,6 | |
| Total | 29 | 63,1 | 17 | 36,9 | 46 | 100 | |

**The Relationship between Attitude Level and Completeness of providing basic Immunization**

There were relationship between maternal attitude and the completeness of providing basic immunization in infants aged 12 months.

**Table 4 : Attitude Level and Completeness of providing basic Immunization**

| Attitude | Completeness of providing basic Immunization | | | | Total | | P value |
|---|---|---|---|---|---|---|---|
| | Complete | | Incomplete | | | | |
| | f(x) | % | f(x) | % | f(x) | % | |
| Positive | 24 | 52,2 | 2 | 4,3 | 26 | 56,5 | 0.000 |
| Negative | 5 | 10,9 | 15 | 32,6 | 20 | 43,5 | |
| Total | 29 | 63,1 | 17 | 36,9 | 46 | 100 | |

**The Relationship between Family Support Level and Completeness of providing basic Immunization**

There were relationship between family support and the completeness of providing basic immunization in infants aged 12 months.

**Table 5 : The Relationship between Family Support Level and Completeness of providing basic Immunization**

| Family Support | Completeness of providing basic Immunization | | | | Total | | P value |
|---|---|---|---|---|---|---|---|
| | Complete | | Incomplete | | | | |
| | f(x) | % | f(x) | % | f(x) | % | |
| Support | 26 | 56,6 | 5 | 10,7 | 31 | 67,4 | 0.000 |
| Do not Support | 3 | 6,6 | 12 | 26,1 | 15 | 32,6 | |
| Total | 29 | 63,2 | 17 | 36,8 | 46 | 100 | |

**The Relationship between Health Workers Support Level and Completeness of providing basic Immunization**

There were relationship between health workers support and the completeness of providing basic immunization in infants aged 12 months.

**Tabel 6 : The Relationship between Health Workers Support Level and Completeness of providing basic Immunization**

| Health Workers Support | Completeness of providing basic Immunization | | | | Total | | P value |
|---|---|---|---|---|---|---|---|
| | Complete | | Incomplete | | | | |
| | f(x) | % | f(x) | % | f(x) | % | |
| Support | 25 | 54,3 | 3 | 6,6 | 28 | 60,9 | 0.000 |
| Do not Support | 4 | 8,7 | 14 | 30,4 | 18 | 39,1 | |
| Total | 29 | 63 | 17 | 37 | 46 | 100 | |

## Discussion

Based on data analysis using the Chi Square test, it was concluded that there was a relationship between maternal knowledge and the completeness of basic immunization in 12-month-old infants. The results of this study were consistent with research conducted by Odusanya (2008) which showed that maternal knowledge about immunization (p = 0.006) was significantly related to immunization coverage. Maternal knowledge referred to what is known by mothers about complete basic immunization which included the type of complete basic immunization, diseases that can be prevented by immunization, immunization schedule, the number of doses given, and the benefits of immunization. People who are highly knowledgeable tended to have a better mindset so they try to apply a healthy lifestyle behavior[1,9].

The results of this study differed from the results of the study of Astrianzah (2011) which examined that there was no relationship between the level of maternal knowledge and the status of complete basic immunization in infants (α = 1,000). In this study, knowledge was everything that was known or answered

by respondents about complete basic immunization in infants including the notion of immunization, benefits of immunization, type of immunization, and timing of immunization in infants. Knowledge was divided into three categories, namely good, sufficient, and less knowledge. Maternal knowledge about the completeness of basic immunization provision found that the majority of respondents' knowledge in the good category was 24 respondents, sufficient categories were 7 respondents, and less knowledge categories were 15 respondents. A person's knowledge was influenced by several factors, including age, education, occupation, interests, experience, culture, and information.

Based on data analysis using the Chi Square test, it was concluded that there was a relationship between maternal attitudes and the completeness of basic immunization for 12-month-old infants. The results of this study were consistent with Isnaini's research (2011) which stated that there was a significant relationship between maternal attitudes and compliance with basic immunization for infants. The formation of attitudes was based on the ability to think to understand and explore the completeness of basic immunization. Positive attitude of a mother, who has formed, can have a good impact on the basic immunization status of their children. On the other hand, if the maternal attitude was negative towards giving immunization, it can have a negative impact on the child's immunization status. The results of this study differed from studies conducted by Conscience (2013) that there was no relationship between maternal attitudes and the completeness of children's basic immunizations with a value of p = 0.671.25[10].

According to the data, the attitude of the respondents in the statement of immunization to infants did not have to be in accordance with the specified schedule, there were respondents who answered agree. For the statement of each complete basic immunization can be done at health service, health center, midwife practice, or doctor's practice. There were respondents who answered disagree. In addition, in the statement of the frequency of giving complete basic immunizations to 12-month-old infants was 12 times, many respondents answered less agree as many as 16 respondents. From the results of the study, it can be illustrated that there were still negative attitudes of mothers about the statements above. In this case, maternal knowledge was very important. If mother has less knowledge about basic immunization, then maternal attitude will be negative, hence, her child was not given complete immunization.

Based on data analysis using the Chi Square test, it was concluded that there was a relationship between family support and the completeness of basic immunization for infants aged 12 months. The results of this study were in accordance with the study of Giantiningsih et al (2013) that the Chi Square Test results obtained exact value with p value of 0.204 <0.05. This examined about the relationship between the role of the family and the completeness of basic immunization in infants aged 10-12 months. The results of this study differed from studies conducted by Gunawan (2009) which stated that there was no significant relationship between family support and the administration of Hepatitis B 0-7 immunization to infants. The best family support in this study lies in the domain of assessment which included families listening to the complaints of mothers when having difficulties in providing immunizations, families caring about maternal fears about the side effects of giving immunizations to their babies, and families always involving mothers in making decisions for provide complete immunization[11].

Based on data analysis using the Chi Square test, it can be concluded that there was a relationship between health worker support and completeness of basic immunization for 12-month-old infants. The results of this study were in accordance with the research of Jusuf (2015) using the Chi Square test p value = 0.031 <α = 0.05. 28 The results of this study differed from research conducted by Yahiji (2015) which revealed there was no relationship between the health profession support and complete basic immunization with p value of 0.580. Health behavior of a person or community was also determined by the presence or absence of health information. The results of this study were obtained by mothers who said they had received counseling about basic immunization from health workers as many as 33 respondents. This depicted that the majority of respondents had received information or information from health workers, so it can be concluded that the factors that encourage mothers to immunize their infants because of the support of health workers[12,13].

The dominant factor related to the completeness of basic immunization based on multivariate statistical

tests was knowledge. The results of this study were supported by Tampemawa's study (2015) which mentioned that the most dominant variable influencing the immunization status of children aged 12-24 months was maternal knowledge. In this study, mothers with good knowledge showed higher completeness of basic immunization rates than mothers with less knowledge. Based on the logistic regression statistical tests that have been carried out, there was a 39.9 times greater risk to immunize their infants in mothers who have good knowledge about immunization compared with less knowledge. This was in line with Notoatmodjo (2010) which stated that a person's actions on health problems will basically be influenced by one's knowledge of the problem[14,15].

## Concusion

There were relationship between maternal knowledge, maternal attitude, family support, and health workers support and completeness of providing basic immunization in infants aged 12 months. Health dominant factors that were related to completeness of providing basic immunization were maternal knowledge.

**Ethical Clearance**: Taken from the Faculty of Nursing, Universitas Airlangga, Surabaya committee, with the number "212-KEPK".

**Source of Funding:** The research was funded by author.

**Conflict of Interest**: There is no conflict of interest

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# The Effect of Soot Particulate towards Vascular Cell Adhesion Molecule-1 (VCAM-1) Expression in the Mechanism of Cardiovascular System Disruption

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## Abstract

**Background:** Air pollution is associated with cardiovascular morbidity and mortality; however, the underlying mechanisms are not yet clearly understood. Several previous studies have implicated potential mechanism action including oxidative stress, systemic inflammation, autonomic dysfunction, and endothelial dysfunction. Several epidemiological studies have examined the association between ICAM-1, VCAM-1 and particulate matter.

**Objective:** To describe the effect of soot particulate exposure in VCAM-1 expression in the mechanism of cardiovascular dysfunctions.

**Methods:** The experiment was conducted in laboratory female rats (Rattus novergicus) and consisted of 3 groups: Control group (n=10), without soot particulate exposure; Treatment 1 group (n=12), exposed by soot particulate with the concentration of 532 mg/m3 an hour each day for 30 days; Treatment 2 group (n=12), exposed by soot particulate with the concentration of 1064 mg/m3 an hour each day for 30 days. The expression of VCAM-1 on cardiac tissue was measured after the end of treatment by immunohistochemical examination. The differentiation of VCAM-1 expression among the groups was tested using the Kruskal-Wallis test and the Mann-Whitney test.

**Results:** The mean rank of VCAM-1 expression in the control group, treatment group 1 and treatment group 2 was significantly different (8.85, 17.63, 24.58, p=0.001). There was a significant difference in VCAM-1 expression by using the Mann-Whitney test among groups ($p < 0.05$).

**Conclusion:** The exposure to soot particles increased VCAM-1 expression significantly in laboratory animals. Our findings indicated the important role of the inflammatory activation pathway as a response to soot particulate exposure in the mechanism of cardiovascular disease.

***Keywords:*** *Soot particulate, vascular cell adhesion molecule-1 (VCAM-1)*

## Introduction

Cardiovascular disease is the leading cause of death and morbidity in the world [(1)]. Epidemiological studies showed an important association between cardiovascular morbidity and mortality after exposure to particles in air pollution, especially particulate matter (PM); however, the mechanism remains unclear. [(2, 3)]. In the last 15 years, air pollution that induces cardiovascular disease has been the focus of intensive research among cardiologists and environmental medicine experts [(4)]. The comparisons of six cities in the United States with different levels of pollution found an increased risk of cardiovascular cases from atmospheric pollution with fine particles [(3)]. PM exposure as a result of air pollution has been a risk

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factor for cardiovascular disease including arrhythmias, myocardial ischemia, myocardial infarction, and heart failure. Nearly 1 million people at risk of death from cardiovascular disease are associated with PM worldwide every year. The risk of myocardial infarction is estimated to be 1.48 times greater for a small increase in PM (25 μg / m3). Compared to the risk of myocardial infarction which was reported, it was approximately 3 times higher in smokers than non-smokers. The increased risk of cardiovascular disease associated with PM is relatively smaller compared to traditional risk factors such as smoking, diet, obesity, diabetes, metabolic syndrome, etc. However, air pollution with the PM is encountered by a larger number of population and lasts a lifetime [(1)].

One of the suspected instrumental mechanisms is the occurrence of oxidative stress which will then increase the Reactive Oxygen Species (ROS) in the body that can cause cell damage through a chain reaction called lipid peroxidation. This oxidative stress further induces changes in the cardiovascular system [(4)]. Exposure to PM can result in lung inflammation, with the release of proinflammatory cytokines by alveolar macrophages that regulate local inflammatory responses. These cytokines also enter the circulation, resulting in systemic inflammation, in which the bone marrow is stimulated and releases leukocytes and platelets, as well as stimulate the liver to produce Creative protein (CRP) and fibrinogen [(3, 5, 6)]. The high levels of CRP will affect endothelial function by weakening the reactivity of nitric oxide (NO) and increasing the expression of intercellular molecule adhesion molecule-1 (ICAM-1), vascular cell adhesion molecule 1 (VCAM-1), and E-selectin. ICAM-1 and VCAM-1 can also be stimulated by interleukin1-β (IL-1β) and tissue necrotic factor-ά (TNF-ά). Increased levels of these cytokines and adhesion molecules in the blood are associated with the widespread of coronary and carotid artery disease. ICAM-1 and VCAM-1 are the members of the Immunoglobulin superfamily and have a role in binding monocytes, lymphocytes to the endothelium, allowing them to enter the intima tunica. This is very important in the process of atherosclerosis [(5, 7)]. The experiment on laboratory rabbits that were given PM exposure to its lung can increase the expression of adhesion molecules on the endothelium. This suggests that several stimulations that induce lung inflammation can also activate vascular endothelium. Active endothelial cells will decrease NO production and increase endothelin. Increased endothelin has been documented in patients with atherosclerosis and coronary disease. Endothelin is a vasoconstrictor and activates monocytes that affect the inflammatory response. This study suggests that pulmonary inflammation increases endothelial dysfunction markers in the circulation. It indicates a possible association between pulmonary inflammation and the occurrence of atherosclerosis [(5)].

In one epidemiological study, Pope et al., (2004) reported that PM exposure [(2, 5)] was a risk factor of cardiovascular disease mortality through pulmonary and systemic inflammatory mechanisms, accelerated atherosclerosis and altered cardiac autonomic function [(8)]. The national study conducted in the United States (US) currently estimated each decrease is 10ug/m3 levels of PM is associated with an increase in life expectancy of 0.61 years [(9)]. Very few epidemiological studies examined the relationship between ICAM-1 and VCAM-1 with PM. This inflammation and endothelial dysfunction can be a process in which air pollution affects the cardiovascular system [(7)].

Based on the elaboration above, the researchers are encouraged to research the effect of soot particulate exposure on VCAM-1 expression in the cardiovascular system by using a laboratory experiment method and rats as the experimental animals.

## Method

### Subjects

The experimental unit of this study was the hearts of female white rats (Rattus novergicus) which fulfilled the research criteria of female rats (Rattus novergicus), aged 4 months (16 weeks), weight 100-200 grams, and healthy. The research was conducted at the Biochemical Laboratory of Faculty of Medicine Universitas Airlangga and Department of Veterinary Anatomy Faculty of Veterinary Medicine, Universitas Airlangga. It was conducted for 6 months with the stages including giving particulate exposure for 30 days, laboratory animal surgery after treatment, VCAM-1 expression examination with immunohistochemical methods.

This research was a laboratory experimental research conducted to examine the hypothesis through several stages of research. The study protocol was approved by

the Ethical Commission to conduct basic science/clinical research in Dr. Soetomo General Hospital Surabaya. The descriptive data analysis was presented in the mean ± SD or median form and the frequency was showed in percentage. To test the normality of data distribution, the present study applied the 'one-sample Kolmogorov-Smirnov test'. One Way ANOVA parametric statistical test was performed to examine the normal data distribution. If there was a significant difference, then it is followed by Post Hoc (Tukey HSD) statistical test. On the other hand, the abnormal data was examined by the non-parametric statistical Kruskal-Wallis test and followed by Mann-Whitney U statistical test. The results of data analysis were displayed in graphics. The data analysis was processed by using SPSS software version 20 (SPSS, Inc., Chicago, IL)

## Results

### Observational Data

The results of VCAM-1 expression measurements were obtained by applying immunoreactive score scale (IRS) according to Remmele and Stegner[32] This immunoreactive score index (IRS) or Remmele scale was the result of multiplication of the intensity of the color reaction and the percentage of cells with positive reactions (∑ = A x B) (score 0-12). It was obtained the difference of VCAM-1 expression among groups (control: mean rank 8.85; T1: mean rank 17.63; T2: mean rank 24.58) (table 1, 2, 3 and figure 1, 2).

### Data Analysis

There was a significant difference in VCAM-1 expression among groups (p=0.001) by using the non-parametric Kruskal-Wallis statistical test (table 4). Based on the result of the Mann-Whitney test, it was obtained a significant difference of VCAM-1 between the Control group and Treatment 1 group (p=0.015), between Control group and Treatment 2 (p=0.000), and between Treatment 1 and Treatment 2 group (p=0.048) (table 5).

**Table 1. The VCAM-1 expression using IRS index (score 0-12) according to Remmele and Stegner**

| A-Percentage of positive cells | B-Color reaction intensity |
|---|---|
| 0: no cells with positive reaction | 0: no color reaction |
| 1: < 10% cells with positive reaction | 1: low color reaction intensity |
| 2: 11-50% cells with positive reaction | 2: medium color reaction intensity |
| 3: 51-80% cells with positive reaction | 3: strong color reaction intensity |
| 4: > 80% cells with positive reaction | |

**Table 2. The VCAM-1 expression in Control group and Treatment group**

| No. | Slide number | IRS index | Slide number | IRS Index | Slide number | IRS Index |
|---|---|---|---|---|---|---|
| 1 | C 1 | 0 | T1.1 | 1 | T2.1 | 1 |
| 2 | C 2 | 0 | T1.2 | 1 | T2.2 | 4 |
| 3 | C 3 | 0 | T1.3 | 0 | T2.3 | 2 |
| 4 | C 4 | 1 | T1.4 | 2 | T2.4 | 1 |
| 5 | C 5 | 0 | T1.5 | 0 | T2.5 | 2 |

***Cont.*. Table 2. The VCAM-1 expression in Control group and Treatment group**

| | | | | | | |
|---|---|---|---|---|---|---|
| 6 | C 6 | 2 | T1.6 | 3 | T2.6 | 3 |
| 7 | C 7 | 0 | T1.7 | 1 | T2.7 | 2 |
| 8 | C 8 | 0 | T1.8 | 0 | T2.8 | 2 |
| 9 | C 9 | 0 | T1.9 | 2 | T2.9 | 4 |
| 10 | C 10 | 0 | T1.10 | 2 | T2.10 | 1 |
| 11 | | - | T1.11 | 1 | T2.11 | 2 |
| 12 | | - | T1.12 | 2 | T2.12 | 2 |
| Average | | 0.3 | | 1.25 | 2.16 | |

**Table 3. The VCAM-1 expression in Control group and Treatment group**

| | **Group** | **N** | **Median** | **Mean Rank** |
|---|---|---|---|---|
| IRS | Control | 10 | 0.00 | 8.85 |
| | Treatment 1 | 12 | 1.00 | 17.63 |
| | Treatment 2 | 12 | 2.00 | 24.58 |
| | Total | 34 | | |

**Table 4. The results of Kruskal-Wallis test in VCAM-1 expression**

| | **IRS** |
|---|---|
| Chi-Square | 14.809 |
| Df | 2 |
| Aymp. Sig | 0.001 |

**Table 5. The results of VCAM-1 expression analysis using Mann-Whitney test**

| **Group** | **Value P** |
|---|---|
| Control-Treatment 1 | 0.015 |
| Control-Treatment 2 | 0.000 |
| Treatment 1-Treatment 2 | 0.048 |

## Discussion

Particulate matter exposure contributes to an increased risk of cardiovascular disease by initiating and promoting the development of atherosclerosis which is the main cause of most cardiovascular diseases [3, 10]. Air pollution can induce peripheral artery, coronary atherosclerosis, and aortic atherosclerosis. PM exposure in a short period has been associated with increased mortality in acute cardiovascular disease [11]. In one epidemiological study, Pope et al., (2004) reported that PM exposure [2, 5] was a risk factor of cardiovascular disease mortality through pulmonary and systemic inflammatory mechanisms, accelerated atherosclerosis and altered cardiac autonomic function [8]. Once it was in PM circulation, it can interact with vascular endothelium or has a direct effect in atherosclerosis plaque which causes local oxidative stress and inflammatory effects in the lung. The endothelial dysfunction caused by PM has been examined in experimental animals in which there

was increased VCAM-1 expression [10, 12].

In 2011, Jette Gjerke Hemmingsen et al. reported that the ROS production increased in the human umbilical vein endothelial cell (HUVEC) that were exposed to PM. The smaller size of PM produces a higher ROS level. The expression of VCAM-1 increases in small size PM exposure as compared to HUVEC control ($p<0.01$) [13]. It indicates the association between PM with oxidative stress and inflammation. In 2011, Aling Dong, et al., compared the retinal vessels that had ischemia with a combination of ischemia and oxidative stress. VCAM-1 expression was higher in retinal vessels that had ischemia and oxidative stress and this increased the lacostasis and bone marrow-derived cells in the retina, which in both cases were blocked by intravenous injection of anti-VCAM-1 antibodies. Increased leukostasis will result in the neovascularization of the retina [14].

Vascular adhesion molecule -1 is a marker of the earliest lesions of atherosclerosis in experimental animals and is an adhesion molecule key that mediates the emergence of leukocytes in early lesions. Endothelial cells with VCAM-1 expression assist the monocyte cells to roll and cling tightly [15, 16]. The antibody that blocks VCAM-1 or β1 or β2 integrins significantly decreases monocyte adhesion and the ICAM-1 or VCAM-1 gene mutation decreases atherosclerosis in laboratory rats [16]. Zhang Jie, et al. revealed that mast cells, neutrophils, and macrophages released the proinflammatory cytokines such as TNFά, INFγ, and IL6 that induced adhesion molecule expression of endothelial cell and recruited leukocytes that were the pathogenesis of the vascular inflammatory disease [16]. Salvi et al. reported that up-regulation of bronchial adhesion molecules such as ICAM-1 and VCAM-1 occurred after exposed to PM [17].

A research conducted by Swapna Upadhyay, et al., in 2010 reported that particulate matter affected the vascular homeostasis in the lung and systemic. This has been identified based on the analysis of various biomarkers that are related to hypertension (ACE), endothelial activation (ET-1, VCAM-1), coagulation factor (TF, PAI-1) and angiogenesis (VEGF). The up-regulation of VCAM-1 in lung tissue can be due to endothelial cell activation by cytokines which were released from active macrophages or collected neutrophil cells. Various studies have proven that VCAM-1 promotes the progressiveness of atherosclerosis by the accumulation, adhesion, and migration of transcendental leukocytes [18]. Furthermore, active endothelial cells can enhance the expression of PAI-1, VEGF, and VCAM-1 which are responsible for the development of atherosclerotic lesions. In the heart, all the signs measured elevated at high levels on day 3 after the exposure [18, 19].

In this study, the results indicated a significant difference in VCAM-1 expression among groups ($p=0.001$). It was also obtained a significant difference in VCAM-1 expression between the Control group and Treatment 1 group ($p=0.015$), between Control group and Treatment 2 ($p=0.000$), and between Treatment 1 and Treatment 2 group ($p=0.048$). The results of this study are following the previous studies. These findings support the hypothesis that exposure to soot particulate can increase VCAM-1 expression in the mechanism of cardiovascular system disruption.

## Conclusion

The inhalation exposure of soot particulate matter with the duration of 1 hour daily for 30 days, a dose of 532 mg/m3 and 1064 mg/m3 significantly increased the VCAM-1 expression in the cardiomyocyte cells of the experimental rats. The results also showed that increased VCAM-1 expression was following increased doses of soot particulate matter exposure, which plays a role in the inflammatory response underlying the occurrence of atherosclerosis. The findings of our study are important in explaining how particulate matter, especially soot, can contribute to cardiovascular causes.

**Conflict of Interest:** There is no conflict of interest in this research**.**

**Source of Funding:** This is research use individual funding.

**Ethical Clearance:** This research has ethical clearance from the Faculty of Medicine, Universitas Airlangga.

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# The Role of Universal Health Coverage in Supporting National Family Planning Program: A Comparative Study

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## Abstract

**Background:** The family planning program in some countries have not been successful yet because the population is growing rapidly. Currently, all the government is trying to provide family planning access in health facilities through the national health insurance program

**Aim:** To compare the role of universal health coverage in supporting national family planning programs

**Method:** This literature study had been made by data reviewing in four different countries which have large population: China, India, the USA and Indonesia. Using the indicator of involvement of UHC in family planning in several countries, there are advocacy and policy, health service, health financing and governance. It was compared the support of contraceptive policy and highlighted the program as a strategy for developing family planning in the national health insurance era

**Results:** Policies related to the use of national health insurance for supporting family planning in several different countries produced different results. In addition to the aspect of finance, the policy on the number of children, the private and public service systems, the priority of contraception choice and family involvement also played a role in the success of the program

**Conclusion:** The correct target program must be immediately determined by the government so it is important for policymakers to self-introspection related to family planning in this country by using the indicator of involvement of UHC.

***Keyword:*** *family planning, universal health coverage, family planning program*

## Introduction

Universal health coverage achievement is defined as providing all people with access to needed promotive, preventative, curative, and rehabilitative quality health services while ensuring that people do not suffer financial hardship in paying for these services. The health system will not be able to achieve UHC by itself. Levels and inequalities in education, income, wealth, and power relationships in society have a bearing on the health resources available, the risk factors to which individuals are exposed, and whether or not people use the services that are available[1,2].

In recent years, integration of family planning services into broader health financing schemes and more specifically, health insurance schemes have been a primary focus for international development. Inclusion of family planning into health insurance can provide a designated, more predictable revenue stream to finance facility-based services and can stimulate underlying demand for services. [1,3].

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The World Health Organization (WHO) has a definition of family planning allows individuals and couples to anticipate and attain their desired number of children and the spacing and timing of their births. Family planning prevents about one-third of pregnancy-related deaths, as well as 44% of neonatal deaths. This is because the timing and spacing of pregnancies at least 2 years between births is needed to prevent adverse pregnancy outcomes[4,5]. The coverage of essential health services with a single number, as well as estimates of gaps in service coverage and more detailed analyses of levels and trends in a subset of service coverage become interesting to discuss particularly in countries which have the biggest number of population in the world [2].

Based on the World Population Review, the top five countries that have the largest number of populations in the world are China (1.433.783.686), India (1.366.417.754), the United States (329.064.917), and Indonesia (270.625.568). The current values of the UHC index of coverage of essential health services show a unique finding, some countries have good achievements and the other not in this paper it will try to compare the role of universal health coverage in supporting national family planning programs in these countries.

## Method

The study used a literature review method through an electronic search of the published literature. The data collection was done with the time limited sampling that conducted from the 2014s until the recent literature. The literatures are available in soft copies; such as PDF journals and direct reading from online journal articles scientifically proven.

A sharp search strategy in digital literature, PubMed and another electronic journal website, was applied by some keywords which obtained "role", "universal health coverage", and "family planning" in five different countries. The highlighting of program as strategy on developing family planning in the era of national health insurance.

The defined inclusion criteria of the studies consists of: (1) the definition of universal health coverage or family planning (2) the study explained the role of universal health coverage to family planning program (3) the studies showed the finding of UHC and family planning in China, India, the United State, Indonesia and Pakistan. (4) the studies included in the review were restricted to English and Indonesia languages. The result of the studies was explained in the result section and the analysis qualitatively provided in the discussion section. Then the citation process was performed by references manager as Mendeley.

## Result and Discussion

### Characteristic of Country

The table below shows the finding of characteristic in each country based on some indicators.

**Table 1: Characteristic of Country**

| Country | Population | Fertility Rate | UHC service coverage index (SDG's 3.8.1) | Family planning demand satisifed with modern methods (%) |
|---|---|---|---|---|
| China | 1.433.783.686 | 1.7 | 76 | 95 |
| India | 1.366.417.754 | 2.2 | 56 | 72 |
| USA | 329.064.917 | 1.8 | ≥80 | 86 |
| Indonesia | 329.064.917 | 2.3 | 49 | 81 |

**Involvement of UHC in Family Planning : Advocacy and Policy**

Evolution of family planning policy in China: the Chinese leader between 1949 and 1976 believed in the principle: "More people, more power" and then they got the hardships of overpopulation but the leader still believed that a larger population was better. China's total fertility rate reached more than six births per woman in the early 1960s. A serious family planning campaign began in China in 1971, commencing with the propaganda theme: "One child isn't too few, two are just fine, and three are too many. In 1973, the State Council established the Leading Group for Family Planning, which was responsible for calling a national birth planning. This family planning campaign was successful; and China's overall fertility rate declined by half between 1971 and 1978. The one-child policy was implemented, in 1979, fertility rates continued to decline. China implemented a policy of 1 child for 30 years, a two-child policy implemented since January 2016 until nowadays.

India was the first country in the world to launch a National Program for Family Planning in 1952. Under the program, the public health sector provides a variety of family planning services at various levels of the health system. "Pariwar Vikas Mission" to improve access to contraception and family planning services in the high fertility district.

The health care system in the United States is quite unique when compared to other developed countries. The United States has no uniform health system, no universal health care coverage. Recently there is a law that requires coverage of health services for all people, which is called the Affordable Care Act (ACA). Since 2013, the entry into force has gradually included provisions for the full coverage of all-female contraceptive methods determined without cost sharing. The Community Health Services Act title X family program is a US government program dedicated to providing family planning services for those in need.

In 2005, the Indonesian government committed to providing health insurance for the poor with the launch of the public health insurance program. That program has now begun a new chapter in the evolution towards universal health coverage. National health insurance is being implemented in stages, with the aim of providing universal health coverage to the entire population by 2019. Indonesia applies a two child policy.

**Health Service**

China has rapidly achieved UHC with benefits that including prevention and comprehensive curative services. In China, improvements in the health system cause the contraceptive prevalence rate of married couples to last more than 85% from 1980 to 2010[7,13–15]. In other hand, the trend of long-term reversible contraceptive methods, IUDs and implants, increased significantly in the US from 2008 to 2014, from 6% to 14%. While women who have lower incomes choose to sterilize, but the figure is quite decreased from 2008 to 2014, which is 32% to 28%[20,21].

In India, Services under the National Family Welfare program currently the family planning methods in India can be broadly classified in two categories – spacing methods. The utilization of contraceptives and distribution of the same to the States/UTs under Free Supply Scheme and through Public-Private Partnership (PPP) under Social Marketing Scheme. Services are dominated by the private sector. The Indian health system has a broad but underutilized health infrastructure. Under the National Rural Health Mission (NRHM), in 2005, Government of India introduced a cadre of female community health workers, called the Accredited Social Health Activists (ASHAs) at village level[16–19].

The services were integrated at the village-level and through multiple sectors. In the 1970s and onwards, about 35,000 salaried family planning field workers worked at the village level to promote contraceptive use and motivate and recruit women into the family planning program.There are trained field workers for family planning. Doctors, nurses, and midwives placed at the local level are encouraged to open their own private practices in the areas where they work. The KB village is expected to become an icon of the population, family planning, and family development (KKBPK) program and reach 14,838 current[11,22].

**Health Financing**

China is reforming and restructuring its health insurance system to achieve the goal of universal

coverage. In 2013, 94.5% of this population owned at least one type of public insurance, and 12.2% bought private insurance. In general, rural populations in China tend to be uninsured and are less likely to buy private insurance. There is a very large socioeconomic gap in public and private insurance coverage[23–25].

India urgently needs UHC - around 600 million people fail to access the health services they need and 63 million Indians are living in poverty because of healthcare costs. The root cause of India's health woes is its chronically low levels of public spending on health. Most Indians are forced to buy services from private providers and in particular from expensive, profit-maximizing hospitals[26].

In America, 28.5 million people remain uninsured, representing nearly 9% of the total population. For comparison, two-thirds of the insured population are covered by private health insurance with the remainder covered under public insurance. Coverage of compulsory employer contraception insurance in the US has become a controversial component of the Canestaro Affordable Care Act (ACA), 2017. Based on a Medicaid statement (as of May 2014), there are more than 2.5 million women of reproductive age who are low income and without insurance, are at risk of unwanted pregnancy and may require family planning services (unmet need) [21,27,28].

Approximately 36.8 percent of Indonesia's population does not yet have any form of health coverage, including those working in the informal sector. There were strong support and financial commitments from international donors and the Government of Indonesia to the family planning program, and there was sufficient financing for the program[11,12,29].

**Governance**

Using Kingdon's theory moved China beyond the frequently used political economy method of analyzing how reforms are introduced when political compromises are made by various stakeholders[23]. In addition, India, The Family Planning division has augmented efforts for improving quality in sterilization service provision. In 2014, Family Planning division updated the manual on Standards and Quality Assurance in Sterilization Services. The Quality assurance committees have been established across all States and districts[16,26].

The U.S, The responsibility for these two functions is shared by private insurance companies as well as the government, both of which are known in policy terms as "payers." As such, the United States can be thought of as a "multi-payer" system. The final structure and outcome of the U.S. healthcare system are unknown, these disagreements between providers, patients, insurers, and political parties will be instrumental in shaping the healthcare provided to Americans[28].

Therefore, there was a very strong political commitment from the government at all levels in Indonesia. Using strong behavior-change communications campaigns and the provision of the clinic and integrated community- based services, BKKBN facilitated the decrease in the birth rate, a decrease in maternal mortality, and contributed to the health and increased economic participation of women[11,30,31].

## Conclusion

Judging from the policies and laws on the use of national health insurance in the use of contraception, each country has its own policies in the family planning program, including determining the number of children recommended, policies in case of violations and the process of equitable national. Each country faces different problems but from the indicators, it is emphasized that the target is directed at increasing the role of the community as well as efforts to improve the quality of providers and the application of national health insurance to support family planning programs.

**Ethical Clearance:** The study protocol was approved by the ethics committees of Universitas Airlangga, Surabaya, Indonesia.

**Conflict of Interest:** None.

**Source of Funding:** This research funded by author.

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# A Study to Assess the Level of Knowledge on Ill Effects of Mobile Usage among Adolescents in Selected College at Kancheepuram District, Tamilnadu, India

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## Abstract

Mobile phone is a device used to communicate verbally all over the world who are not near to us, it is common in adolescents. Mobile phone became more and more a tool in our daily life.Therefore a study was done to assess the knowledge on ill effects of mobile usage among students at selected college,Kanchipuram district, Tamilnadu, India. Was undertaken with the objectives: to assess the knowledge on ill effects of mobile usage among students and to associate the knowledge on ill effects of mobile usage with selected demographic variables. Non experimental - Descriptive research study was conducted. The study sample consisted of total 55 adolescents. Data was analyzed by inferential statistics and presented through tables and figures. Findings revealed that Variables like, number of mobile phone is found to be significant. The number of students having moderate knowledge were 28(51%), inadequate knowledge was 20(36%) and adequate knowledge was 7(13%). Mean value 4.8 and standard deviation (SD) 1.6 are as follows.

***Key words:*** *Knowledge, attitude, ill effects, prevention*

## Introduction

Mobile phone is a small, portable communication device that enables people to make phone calls whenever and wherever they are. Signal transmission is the very basic concept for mobile phone. The convenience of mobile phone is allowing people to communicate with one another without the limitation of regions and time. The mobile telecommunication has the source of Radio Frequency radiation that produces energy; heat up the tissues.[2] During use, mobile phones usually kept close to the ear, which is very near to the brain. It is suspected that continuous use of mobile phone for longer time may damage brain tissues. Mobile phones are more injurious to people's health as compared to smoking. Mobile phones usage and brain cancer are linked to each other.[4]

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Various studies indicate that the emission from a cell phone can be extremely harmful, causing tumors, memory loss, and increased blood pressure and weakening the immune system. This is alarming information, and one has to take into account all these factors.

Therefore, the present study is designed to investigate the mobile phones and also to contribute to the increase in social awareness of health problems associated with the use of this device. Problems related to mobile phones are an area which is not explored much by nurse researchers. Hence the researcher felt the need to conduct study among fourth year nursing students about the mobile phones dependence and its harmful effects on health.[3]

## Materials & Method

The methodology of research indicates the general patterns of organizing the procedure for getting valid and reliable data for investigation. Quantitative, non-experimental - evaluative approach with descriptive

research design was used in this study**.** The study was conducted at selected colleges Kanchipuram district, Tamil Nadu, India. A Simple random sampling was used to select 55 samples..The study was conducted at selected colleges, Kanchipuram District, Tamilnadu.

**Description of The Tool:**

The tool was organized into 2 sections.

Section A -- Demographic variables:

It consists of demographic data of the students -- Age in years, Gender, Type of family, Monthly income,Number of mobile phone, Type of mobile phone in your home.

Section B -- : Assess the knowledge on ill effects of mobile usage among college students.

**Study Findings**

- Regarding demographic variables

Majority of the adolescents 38(69%) with in the age group of 14-16Years.

Majority of the adolescents 29(53%) were male.

Majority of the adolescents 26(47%) were extended family.

Majority of the adolescents 24(44%) were having monthly income of 5000 and below.

Majority of the adolescents 26(47%) were using 1 number of mobile phone at home.

Majority of the adolescents 35(63%) were using basic mobile phone at home.

Hence it is stated that there is significant association between the level of knowledge with selected demographic variables of adolescents like number of mobile phones at home on ill effects of mobile usage. With regard to the hypothesis $H_2$ is accepted.

- Regarding Knowledge level

13% had adequate knowledge, 46 % had moderate knowledge, 33 % had inadequate knowledge. Overall mean and SD of mothers with related to knowledge aspects, From the above discussion, it is seen from the results that the highest mean score noticed is 4.8.

- Regarding Association: The findings shows that there was significant association between demographic variables (number of mobile phone at home) and there was no significant association between demographic variables ( age in years, gender, type of family, monthly income, type of mobile phone in your home on ill effects of mobile usage among adolescents).

## Conclusion

The current study provides an update and more inclusive data on Ill effects of mobile usage students in Tamilnadu. A significant variation between male and female students in their ill effects of mobile usage observed. Interventions should consider the gender differences to prevent a Ill effects of mobile usage for college students in Tamilnadu.

**Conflict of Interest**: Nil

**Sources of Fuding:** Self-funding

**Ethical Clearence:** Chettinad Academy of Research and Education, Institutional Human Ethics Committee

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# Learning of Patient Identification in Patient Safety Programs Through Clinical Preceptor Models

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## Abstract

Clinical Preceptorship Learning Model is a learning model that is implemented in hospitals with guidance supported by guidance, assistance for nursing students, who are currently educating in hospitals. A clinical Preceptorship implementation model that will determine learning competence and also patient safety planning. This research is a type of quantitative research with research. Data collection is done by collecting and distributing questionnaires. Respond to 114 nursing students with total sampling techniques. Data processed by the Spearman test. The results showed that the application of the clinical Preceptorship model was expressed well (89.5%), and the application of patient safety learning was stated to be good (91.2%). The p value of 0.024 shows the relationship between the clinical Preceptorship implementation model and the implementation of the patient safety program and the OR value: 0.298. shows the strength of weak relationships and the direction of positive interactions. Continuing Education Development for Preceptorship Clinics is needed, through Training and also Certification so that the application of this Learning Model can support the goals of nursing education, and the goals of nursing care services available in hospitals

***Keywords****: Identification of patient, Patient Safety, Model, Learning, Nurse, Preceptorship, Student*

## Background

Several studies in the world regarding patient safety studies that cause one patient[1]. Problems that occur in Indonesia. Indonesia reports quite high patient safety issues. Report from the Hospital Safety Committee[2]. The results of a survey of 30 hospitals in Indonesia that show a supportive attitude towards patient safety that supports commitments that are still low[3]. Students are involved in the service process to support patient safety reporting. Data from the Joint Commission International (JCI) shows that there are 13% of surgical errors and 68% of blood transfusion errors[4]. Patient Safety Incident Data published by HPSC (Hospital Patient Safety Committee) in Indonesia contains 114 patient safety reports in 2009, 103 reports in 2010, and 34 reports in 2011 in the first quarter[5]. Patient safety incidents in hospitals will adversely affect hospitals, staff, and patients as service recipients. The impact is a decrease in the level of public trust in Flynn's health services[3].

Nursing students are people who must be the foundation in starting or triggering nursing attitudes. As prospective nurses who will participate directly with patients who participate in providing nursing care, students undergoing an educational process in nursing must complete training in the care of patients who require future care assistance. In the process of education, nurses successfully encourage and assist students in developing nursing skills[6]. Nursing students who practice in hospitals can also make mistakes. Students as individual factors oppose the quality of care and patient safety[7]. Students need to implement and implement a patient safety program so as to prevent injury to patients. Implementation of a good patient safety system by students, then mistakes can be avoided. The integration of the patient safety learning process in the implementation of nursing care for patients needs to be improved with the help of clinics[8]. Suryani's regarding the implementation of patient safety by University X students still occur errors including errors in the flow of assistance one injection drug[3]. The patient recovered in shock, but was immediately approved and resolved immediately so that the patient could be helped. The mistakes made by students at that time were not accompanied by the perception clinic,

because the perception clinic was preoccupied with managerial and management activities for patients who were concurrently held, so guidance for students became less than optimal. Statistical test results obtained from a significant relationship between the perception clinic and patients in Y Hospital[3].

Recommendations from the results of the study include the role of clinical perception and implementation of patient safety by students[9]. The six goals of patient care based on JCI researchers only discuss 5 of the 6 patient safety goals because in their fields professional students are limited in terms of competence and opportunities in doing things to ensure a place, truly procedures, and truly surgical patients. Nursing students who practice in hospitals can also make mistakes. Individual factors derived from students are related to the quality of care and patient safety[7]. Implementation of a good patient safety system by students, then mistakes can be avoided. Students need to integrate patient safety into the learning process carried out on patients with guidance from the perception clinic[8]. Perception clinics are very successful in the process of clinical learning and competency success[8]. Perception clinics guide students, treat patients, and often play many roles including facilitators, trainers, mentors, role models, and evaluators.

## Method

Cross sectional design in this study. This study used a sample of 114 nurses from the Universitas Sumatera utara Faculty of Nursing at Universitas Sumatera utara Medan Hospital. The instrument used consisted of three types, namely questionnaire A about demographic data consisting of age, gender, while the second instrument was questionnaire B about the role of clinical perception consisting of 9 items, including as a facilitator, trainer, educator, role model, evaluator. Meanwhile, the initial instrument, namely questionnaire C about the implementation of patient safety programs by students, consisted of 10 items. Item included; Improve patients properly, improve effective communication, increase the safety of drug use that requires high vigilance, reduce the risk of safety by health workers, reduce the risk of falls. The results of the trial instrument in questionnaire B with Cronbach's Alpha 0,607, while in questionnaire C with Cronbach's Alpha 0.746. Data analysis was performed using the Spearman statistical test. This research has passed an ethics test from the nursing ethics committee of the USU Faculty.

## Result

Univariate Analysis Characteristics of respondents (students) Characteristics of respondents (students) based on the results of research conducted by adult students, women. Of the 114 respondents, based on gender, the largest results obtained were 72 students with a percentage (63.2%) and the average age of students was 22 years with 66 students with a percentage of 57.9%. For the implementation of the clinical Perceptor model in the clinical Perceptor role meeting needs to be categorized well by as many as 102 students with a percentage (89.5%). Implementation of the Patient Safety Program by Students shows that the implementation of patient safety programs by students approves the blessings of 104 students with a percentage (91.2%). Statistical test results showed that there was a significant relationship between the clinical Perceptor implementation model and the implementation of patient safety by nursing students, as evidenced by a significant p value of 0.024 ($p < 0.05$) which showed there was a relationship between the clinical Perceptor implementation model and the implementation of patient safety programs. Spearman rating value of 0.298 indicates the strength of weak relationship and positive direction, meaning the better implementation of the clinical Perceptor model, the better the implementation of the professional student patient safety program in taking patient safety measures.

## Discussion

Statistical test results using the Spearman rank test found the implementation of the clinical Perceptor model both with the implementation of a good patient safety program of 48 students. Statistical results show that the results obtained significance of 0.024 (p value <0.05). From the results of the analysis also obtained the value of OR = 2.098, meaning that with the implementation of the clinical Perceptor model that is less, then students risk 2.098 times greater to carry out patient safety with less than the role of a good supervisor. The results, research entitled Patient Safety in Nursing Education said that the study was conducted by 24 respondents with only 12 qualified nurses found that there was no attitude of the supervisor's role in handling patient safety

risk. At the RSUPN. Dr. Cipto Mangukusumo Jakarta stated that there was a significant relationship between the role of the chief information room and the success of the nosocomial infection control efforts[10]. Clinical counselors involve patients in the learning process to students but must maintain and protect patients[11]. That the role as a professional nurse is the role as a provider of nursing care to patients, ranging from the ability to conduct assessments to conduct evaluations to patients and the ability to provide feedback with patients[16]. A role is a set of behaviors that are expected to arise from someone related to the task in society. Clinical counselors are selected medical teams, experts in clinical practice who request assistance and direct the learning process according to learning objectives[12].The results of research with observations in the preliminary studio show the role of clinical advisors who are difficult to accompany associate students when taking action, students not only have clinical competence but also assist when taking action, increasing the supervisor's intensive is also a supporting factor. The role of the clinical supervisor as a role model or provide examples for students to explain and demonstrate techniques related to the implementation of patient safety programs. Role role model is the expected role of clinical counselors that contain relationships and positive attitudes[13]. If the role of clinical advisors is less than the guidance process and goals will be less than optimal regarding patient safety programs that implement six patient safety goals[2]. Students during practice at the hospital can take care or direct action to patients[14]. The role of the clinical supervisor will determine specific learning competencies related to patient safety. That clinical counselors who have good knowledge and skills will be able to help students to gain knowledge and skills[17]. Clinical counselors have a large participation in the clinical learning process for students to achieve learning goals[15]. The results of the statistical analysis in this study are about the role of the clinical supervisor who has a relationship with the patient administration program related to students, with a positive thing, this is related to the increase in the level of the role of the clinical supervisor so that the higher level of implementation of the patient safety program as well. The results showed positive and the results between the two significant variables with a p value: 0.024 it can be concluded that the research hypothesis was accepted, so it was assumed to use a clinical perception model the better the better the implementation of research by students.

## Conclusion

This study produced conclusions involving a model ofclinical Perceptor implementation with the implementation of patient safety programs by nursing students. Clinical trials with the implementation of patient safety programs by nursing students, to assess, study, improve and encourage for clinic perception and also improve student academic can improve quality and improve student discipline in terms of patient safety. Suggestions The results of this study can also be used as an evaluation material for the management of Universitas Sumatera Utara hospital training to assess the implementation model of clinical perception and pay attention to aspects needed by nursing students while implementing nursing practice for nursing profession education Patient safety by nursing students to improve nursing quality.

**Acknowledgement**: The research was funded by the Republic of Indonesia Ministry of Research, Technology and Higher Education DRPM 2019.

**Conflict of Interests:** The authors declare no conflict of interest

**Source of Funding:** Directorate of Research and Community Service Directorate General of Strengthening Research and Development of the Republic of Indonesia Ministry of Research, Technology and Higher Education in accordance with the Research and Service Funding Agreement for the Budgetary Community 2019

**Ethical clearance:** the study was approved by the central ethics commite of Faculty of Nursing Universitas Sumatera Utara

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# Effectiveness of Structured Teaching Programme on Pulmonary Rehabilitation among Patients with Chronic Obstructive Pulmonary Disease

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## Abstract

A quasi experimental research design was adopted for the study. The study was conducted in tertiary hospitals of kanchipuram district. The sample of the study well COPD (who are fulfilled the inclusion criteria between the age group of 25yrs -55yrs) the purposive sampling technique 56 samples are experimental group and 56 are considered control group. the data collection instrument was the structured interview to assess the knowledge on pulmonary rehabilitation the results revealed that in the post test of the experimental group, the overall mean 39.46 with SD: 0.738 in control group the overall mean 17.52 with SD 3.722 the impaired T-test value was t=37.808 experimental group the T=3.810 control group its depicts the + there is significant difference between the experimental and control group so that the computer based education is effective the past test of dyspnea scale in experimental group over all mean 0.58 with SD: 0.499 in control group over all mean 1.63 with SD:1.396. the impaired T test value was t=14.402 experimental group. The T=1.264 control group based education programme effective. The past test of cat scale in experimental group mean 9.21 SD=2.213, control group cat scale mean 25.88 SD=5.596 increased control group effective.

***Keywords:*** *Video based education, Develop & Enhance knowledge, pulmonary rehabilitation , COPD Patients.*

## Introduction

When a child is born, it cries to take its first breath which continues till death. The respiratory process is thus vital for human survival. The lung takes the important role in maintaining respiration from the birth. As the child grows the lung capacity and function also improves, but due to many factors the vital part corrupted. Respiratory problems are widespread in current scenario due to pollution,Climaticchanges,allergy etc[1].

The human respiratory system not only provides oxygen to each cell of the body but also removes body wastes, filters out infectious agents, and provides air needed for speech. Although the lungs are able to withstand abuse in the form of smoke and other pollutants, a number of disorders impair its function[2]. Some of these maladies are temporary and relatively harmless while others may be life-threatening. Any chronic breathing problem or other cough should be checked [3]. Respiration in simple terms is the act of breathing, a vital function of the body which helps to supply oxygenated blood to the various organs, and aids in elimination of carbon dioxide from the body [4].

Chronic obstructive pulmonary disease is a type of obstructive lung disease where the airways become damaged causing them to narrow.[5] The world department reported that chronic obstructive pulmonary disease is an umbrella term for diseases that impair lungs and leave people feeling breathlessness. Currently 64 million people are affected with COPD worldwide, in India

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almost 24 million adults who are over the age of 40. Chronic obstructive pulmonary disease is predominantly a disease of men and only 40% of cases in India occur among women. Much more than a smoker's cough, it will become the 3rd leading cause of death by 2030.[6]

Pulmonary rehabilitation plays a key role in the management of chronic obstructive pulmonary disease. Health-related quality of life outcomes related to pulmonary rehabilitation explores five themes: optimizing pulmonary rehabilitation components to improve health-related quality of life , characterization of a responder phenotype, suitability of pulmonary rehabilitation following acute exacerbations, exploration of psychological and behavioral mechanisms explaining pulmonary rehabilitation benefits, and long-term maintenance of health-related quality of life benefits after pulmonary rehabilitation.[7] pulmonary rehabilitation is a multidimensional continuum of services, directed to persons with pulmonary disease and their families usually by an interdisciplinary team of specialists, with the goal of achieving and maintaining the individual's maximum level of independence and functioning in the community. Pulmonary rehabilitation improve the sense of control of a patient over their disease, as well as their emotions.[8]

A qualitative study was conducted on "self-management behaviors for patients with chronic obstructive pulmonary disease, among 18 patients in College of Nursing, Taiwan. The study concluded that the participants are experts on their lives and, as such, they adopt appropriate disease control behaviors, based on their experience, knowledge, as well as integrate the illness and its symptoms into their lives.[9]A study conducted on "effects of home-based pulmonary rehabilitation in patients with COPD" in Canada. A sample of 252 cases were selected and questionnaire dyspnea sub scale analysis was done. The study reveals that after 4 weeks of education programme, patient took part in home based rehabilitation or out patient, hospital- based rehabilitation for 8-weeks. The study results revealed that both interventions produced similar improvements in the chronic respiratory questionnaire dyspnea subscale; improvement in dyspnea of 0.62 (95% CI, 0.43 to 0.80) units in the home intervention (n=107) and 0.46 (CI, 0.28 to 0.64) units in the outpatient intervention (n= 109). The study concluded that home rehabilitation is a useful, equivalent alternative to outpatient rehabilitation in patients with COPD.[10]

## Methodology

### Research Approach

A quantitative evaluative research approach was considered appropriate for the present study was conducted effectiveness of structured teaching programme on pulmonary rehabilitation among patients with chronic obstructive pulmonary disease in selected tertiary hospital, kanchipuram district,Tamilnadu,India.

### Research Design

A quasi experimental study, Pretest and Post test design.

### Research Setting

The present study was conducted at pulmonary and Medical outpatient departments, Wards, Chettinad hospital and research institute, Kanchipuram district, Tamilnadu.

### Population

The population of the present study comprises of patients with COPD who were attending the Pulmonary and Medicine Outpatient department and admitted in wards in a selected tertiary hospital, Kanchipuram District, Tamilnadu.

### Sample Size

The total sample used for the study was 112 patients with Chronic Obstructive Pulmonary disease. The assigned samples in experimental group 56 and control group 56.

### Sampling Technique

Purposive sampling technique was used for the study.

Sampling Criteria

Inclusion Criteria

- Patients with chronic obstructive pulmonary disease who are willing to participate in the study and present at the time of data collection.

- Patients with chronic obstructive pulmonary disease who can understand Tamil or English.
- Both male and female patients.

**Exclusion Criteria**

- Patients with Chronic obstructive pulmonary disease who are seriously ill.

**Description of the Tool**

**Section A**

The structured questionnaire consists of closed ended questions to elicit the information on demographic data. It consists of demographic variables like a age, gender, education, marital status, occupation, history of smoking, co morbid conditions and BMI.

**Section B**

Knowledge questionnaire regarding pulmonary rehabilitation.

**Section C**

Modified Medical Research Council Dyspnea Scale comprises of 5 statements regarding Breathlessness. Grade>2 or equal is consider as High risk.

**Section D**

COPD assessment test is a standardized scale which includes 8 subjective statements regarding symptoms of COPD. If score >30 is consider as very high risk. Score<10 is consider as low risk.

**Section E**

Structured teaching programme on Pulmonary rehabilitation refers to educating the chronic obstructive pulmonary disease patients on breathing retraining and bronchial hygiene technique, respiratory muscle training, nutritional counseling, guidelines for cessation of smoking, alcohol and beverages, stress relaxation techniques for 30 Minutes.

## Method of Data Collection

112 patients with COPD was selected using simple random sampling technique. Among Patients with COPD in Pulmonary unit considered as Experimental group and Medical unit patients considered as control group to prevent sample contamination. The objective of the study was explained and Informed consent was obtained from both the groups. Demographic data was collected by using structured questionnaire, Breathlessness and COPD patient quality of life was assessed by using standardize scale such as CAT assessment and mMRCdysnea scale. The experimental group was divided and was given Structured teaching programme on Pulmonary rehabilitation for 30 minutes on Day1 and Day 8. The Post test was assessed on day 15 in both experimental and control group. The nurse investigator thanked the participants for their cooperation throughout the data collection period.

## Statistical Analysis

A statistical software programme (SPSS) was used for data analysis. Descriptive statistics was used to analyze Frequency, Percentage, and Mean in all the aspects such as demographic variables, level of knowledge among experimental & control group. Chi-square used to identify the association between the selected demographic and the level of knowledge.

## Results and Discussion

The majority (54%) patients were in the age group of 36-45yrs in experimental group. In control group majority (57%) of patients were in the age of 46-55 years. The mean age and Standard deviation as 43.51(6.65) in experimental group and 46.14(5.95) in control group. The majority 96 % of the patients were married in experimental group and 98% of the patients were married in control group.57% of the patients were in the primary school in experimental group and In control group majority 53% of the patients were primary school. Majority 53% of the patients were private employee in experimental group, In control group majority 54% of the patients were private employee.43% of the patients were getting below Rs. 8000 in experimental group and control group majority 61% of the patients were getting Rs.8001-12000.63% of the patients were not having habit of smoking and 27% of them having history of smoking in experimental group. In control group 80% of the patients were not having habit of smoking and 20% had habit of smoking. The majority i.e.57% of the patients having obstructive sleep apnoea, 23% of them were having hypertension and 20% of them were having

diabetes in the experimental group. In control group majority 54% of the patients were having obstructive sleep apnoea, 34% of them were having hypertension and 12% of them were having diabetes. The majority 57% of the patients was having COPD for the past 4-5 years and In control group majority 71% of them were having 4-5 years. The majority 88% of the patients were normal weight, In control group majority 86% of the patients were normal weight, The mean BMI and Standard deviation as 25.08 + 2.77 in experimental group and 23.39 + 3.24 in control group.

The study findings showed that majority of the patients pre and post test level of knowledge in the experimental and control group. The pre test mean value of knowledge as 16.79 and standard deviation 4.499 post test level of mean 39.46 and standard deviation 0.738 the value of t is -37.80 which has statistically significant at $p<0.001$ in experimental group. control group the pre test mean as 15.07 and standard deviation 3.562 and the post test mean as 17.52 and standard deviation 3.722 the value of t is -3.810 which has statistically significant at $p<0.001$ in control group. In experimental group, CAT score depicts the pre test mean value as 24.38 and standard deviation 3.333 and post test level of mean 9.21 and standard deviation 2.213 the value of t is- 31.454, where as in control group the pre test mean as 24.05 and standard deviation 3.544 and post test level of mean 25.88 and standard deviation 5.596 the value of t is -2.743 which has not statistically significant at $p>0.001$. In experimental group, Dyspnea grade depicts the pre test mean value as 1.98 and standard deviation 0 .522 and post test level of mean 0.57 and standard deviation 0.499 the value of t is- 14.402, where as in control group the pre test mean as 1.88 and standard deviation 0.605post test level of mean 1.63 and standard deviation1.396 the value of t is-1.264 which has not statistically significant at $p>0.001$. A study aimed to determine the effects of a comprehensive eight-week pulmonary rehabilitation program on the physiologic response to and performance of ADLs in patients with COPD. Methods Before and after pulmonary rehabilitation, 31 patients with COPD (71% men; mean age: 64.2±8.4 years; mean $FEV_1$: 54.6±19.9% predicted) performed physical function tests, the Canadian Occupational Performance Measure (COPM) and an ADL-test.After rehabilitation, patients with COPD used a significantly lower proportion of their peak aerobic capacity and ventilation to perform ADLs, accompanied by lower Borg scores for dyspnea and fatigue.The study concluded that the comprehensive pulmonary rehabilitation program can improve the physiologic response to and actual performance of ADLs in patients with COPD[11].

A study conducted on "education in pulmonary rehabilitation: the patient's perspective" in Ireland. A sample of 32 patients with COPD were selected and educated about pulmonary rehabilitation. The study reveals that patients had deficit knowledge, understanding and management of their disease. So the researcher educated about management of breathlessness, management of exacerbations, medications, and psychological support, welfare and benefits systems. The study concluded that subject's gained knowledge regarding pulmonary rehabilitation after pulmonary rehabilitation education programme.[7]Both the study results reveals that there was a significant difference between the pretest and Post test level of knowledge and CAT score and dyspnea Grade in the experimental group which indicates that pulmonary rehabilitation can be implemented in management of patients with COPD.

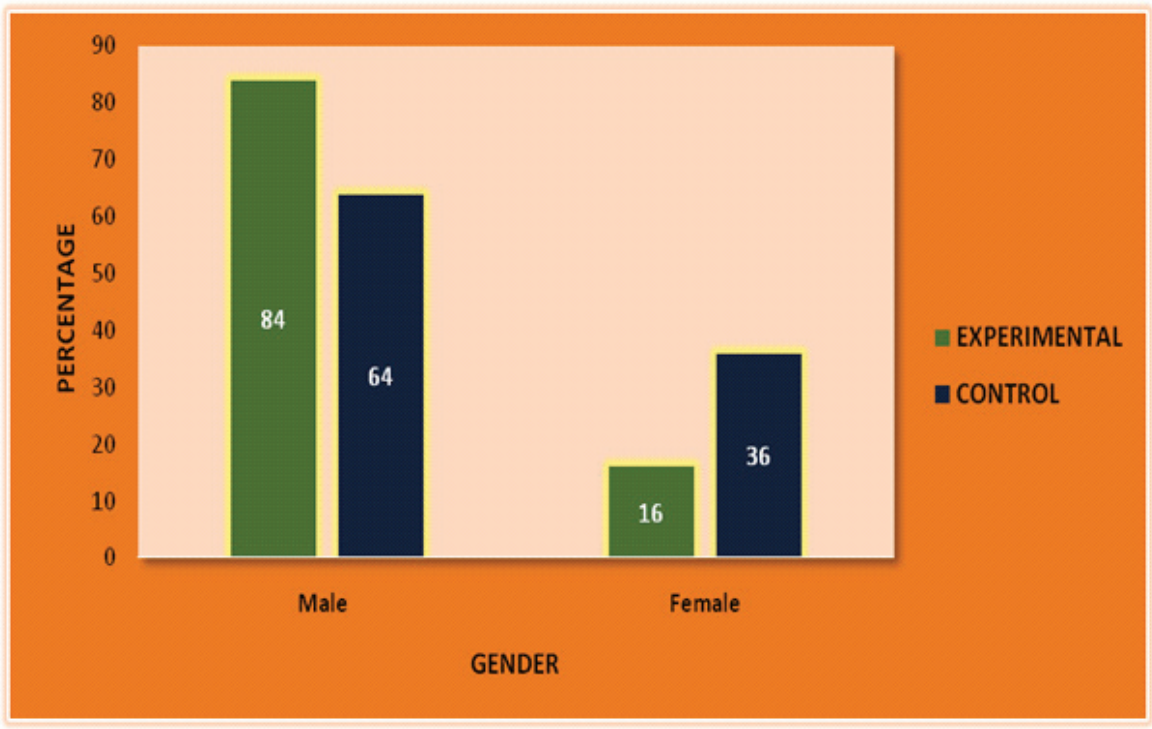


**Fig: Percentage distribution of samples with reference to gender**

| GROUP | PARAMETERS | PRETEST | | POST TEST | |
|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD |
| **Experimental** | Knowledge level | 16.79 | 4.499 | 39.46 | .738 |
| Control | | 15.07 | 3.562 | 17.52 | 3.722 |
| Experimental | CAT score | 24.38 | 3.333 | 9.21 | 2.213 |
| Control | | 24.05 | 3.544 | 25.88 | 5.596 |
| Experimental | Dyspnea scale | 1.98 | .522 | .58 | .499 |
| Control | | 1.88 | .605 | 1.63 | 1.396 |

**Mean and Standard Deviation regarding pre and post-test level of knowledge on Pulmonary Rehabilitation, CAT score and dyspnoea Grade among patients with chronic obstructive pulmonary disease in experimental and control group.**

## Conclusion

Based on the findings of the study the conclusion was drawn. Pulmonary rehabilitation was found to be effective in improving the level of knowledge and reducing CAT scale score and dyspnea grade among patients with chronic obstructive pulmonary disease. The findings of the study revealed that there were significant increase in the level of knowledge and reducing CAT scale score and dyspnoea grade among patients chronic obstructive pulmonary disease in experimental group after pulmonary rehabilitation and minimal changes in level of knowledge, cat scale and dyspnoea scale in the control group who was on usual routine care. On the basis of this the research hypothesis was accepted.

**Conflict of Interest** -Nil

**Source of Funding-** Self funding and no externalfunding.

**Ethical Clearance**: Obtained clearance from institutional human ethical committee on13.04.2018.

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# Nicotine Adds Risk Factors to the Cardiovascular System and Increases Mortality and Sudden Cardiac Arrest

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**Abstract**

The Work began on 7th of January 2019 and for 9 months in General Academic Hospital and Specialized Center for Diabetes and Chronic Diseases on smokers patients in Iraq collecting patient history and duration of smoking (modern, chronic smoking) and on non-smokers and patients. After the collection of analyzes more patients than the **First Group**: of young patients older than> 25 years suffer from tension headache, polycythemia (Increased hemoglobin blood ), Psychology, variant angina, Hypertension, respiratory disease, high triglyceride (TG), shortness of breath so the effect of smoking, pollution and nicotine on patients with chronic youth were evident smoking results : 30% of them have arrhythmias 15% increased Lipid ( LDL,HDL, TG, Cholesterol), 10% psychology, 10% polycythemia (Increased hemoglobin blood ), 10% Coronary disease, 20% Respiratory diseases, 5% High blood pressure, 5% depression. The **Second Group**: are older than> 40 years of chronic smoking and are suffering from atherosclerosis and high blood pressure, Ischemic heart disease, Respiratory diseases in addition to malignant tumors of the lung, heart rhythm disorders, polycythemia, Pulmonary heart disease, The appearance of cancerous tumors inside the mouth and lip, ( MI) myocardial infarction , ACD ( Acute coronary syndrome), So the results were: 20% Arrhythmias, 10% coronary artery disease, 3% polycythemia (Increased hemoglobin blood), 25% chest and respiratory diseases, 9% drug-resistant diabetes, 3% lung and oral cancers, 2% ASD, MI, 18% Increased lipid, 5% depression, In addition to emergencies sudden cardiac death that require the patient to enter Intensive Care Unit and the work of cardiac catheterization to ensure patient safety. Compared to people 65 patient who do not smoke cigarettes there is no aggravation of risk factors and a threat to people's lives directly. Patients are under control of their risk factor Leading to death.

***Keyword:*** *Cigarettes, nicotine, factor risk, Coronary heart disease, atherosclerosis, Electrocardiographic ( ECG), adult population smoke cigarettes. The environment, tobacco.*

## Introduction

**C**igarette smoke contains more than 9,000 chemicals, and greater than 69 known carcinogens, the type of nicotine found in tobacco plants, comes from the nightshade family[1], In this applied scientific work at Academic Teaching Hospital in Samawah, Iraq because of its importance and human value to drive the specter of death and the threat of human life from the harm of smoking and toxic substances carried by cigarettes and tobacco **,** cigars, pipes or water pipes (Hookahs) And chewing tobacco in the mouth , In addition to containing toxic substances Nicotine, Carbon monoxide, Tar, Carbon[2]. Represents an essential risk factor plus chronic conditions, such as cardiovascular disease (CVD), cancer, chronic obstructive lung disease, asthma and diabetes[3]. Smoking cessation is one of the few interventions that can safely and cost- To minimize mortality and morbidity, We focused on research cardiovascular disease ,Cigarette Smoking markedly increases the risk of acute coronary, including myocardial infarction, stroke and sudden death[4]. Smoking accelerates atherogenesis producing premature atherosclerosis in epicedial coronary arteries, the aorta, carotid, and cerebral arteries, as well as peripheral circulation. Other cardiovascular effects of smoking include aggravation of stable angina pectoris, intermittent claudication, vasospastic angina, and restenosis after thrombolysis or angioplasty of coronary or peripheral arteries[5]. Cigarette smoking also promotes progression/aggravation of heart failure, chronic kidney disease and cardiovascular morbidity and mortality in people with chronic kidney disease and increases

the risk of developing atrial fibrillation. So Smokers experience acute myocardial infarction on average at a younger age than nonsmokers, and myocardial infarction is associated with more thrombus and less severe underlying atherosclerosis. Paradoxically, smokers who quit smoking after myocardial infarction have a much better prognosis than non-smokers because they have less severe underlying atherosclerosis and multiple reversible pathophysiological adverse effects caused by smoking[6,7,8]. The aim of the study is to reduce sudden heart disease (SCD) for different ages and to eliminate human life-threatening risk factors and to protect society morbidity and premature death to determine the effect of smoking and smoking cessation among people, coronary artery disease and early atherosclerosis, we assessed the future relationship between the amount Cigarette smoking (status, amount of cigarettes smoked daily, duration of smoking and early heart disease).

## Materials and Method

Work began on 7 January 2019 for 9 months at the General Academic Hospital and the Specialized Center for Diabetes and Chronic Diseases on smokers who collect patient history and duration of smoking (modern and chronic smoking) and on non-smokers and patients attending 915 patients were randomly assigned to both men and women to review clinics Hospitalization, Internal Medicine, Cardiology, Diabetes and Chronic Diseases. Who do not smoke cigarettes only risk factors and diseases around them, examine patients and perform laboratory tests for patients to control heart disease and chronic diseases : HbA1c, RFT, profile fat, CPK-MB, CBP, AST, ALT , Electrolyte blood, Vit -D, ECG, Holter ECG, Treadmill ECG, cardiac enzyme examination, lung function test, taste of stress, pulse, pressure, HR , Sonar (ultrasound) and echocardiography, chesr-x-ray, after collecting analyzes more than patients from the **first Group** young patients over > 25 years of age Suffer from tension headaches, polycythemia, psychology, variant angina vasospastic , high blood pressure, respiratory disease, high triglycerides (TG), dyspnea smoking, pollution and nicotine in patients with chronic youth the results of smoking were clear: 30% of them had arrhythmias, 15% fat gain, 10% psychology, polycythemia By 10%, 10% from coronary artery disease, 20% from respiratory disease, 5% high blood pressure, 5% depression. **Group II:** greater than > 40 years of chronic smoking and suffering from atherosclerosis, hypertension, ischemic heart disease, respiratory diseases, as well as malignant lung tumors, heart rhythm disorders, polycythemia, pulmonary heart disease, the appearance of cancerous tumors inside the mouth and lips, coronary artery disease, so the results were: 20% arrhythmia, 10% coronary artery disease, 5% polycythemia, 25% of chest and organ diseases Respiratory, 9% of drug-resistant diabetes, 3% of lung and mouth cancer, 2% ASD, MI , 21 % increase in fat, 5% of depression, In addition to sudden emergencies cardiac death that requires the patient to enter the intensive cure unit treatment and perform cardiac catheterization To ensure patient safety. Compared to 65 people who do not smoke cigarettes, there is no exacerbation of risk factors and a direct threat to people's lives. They are safer in life for patients under control of the risk factor that leads to death

**pharmacology the nicotine:** Nicotine is a tertiary amine composed of a pyridine and a pyrrolidine ring. Nicotine can reach the brain in as little as **10** seconds after being inhaled. In the body, the half life or nicotine is around **2** hours**..** Once within the blood stream, nicotine travels to the brain where it binds to and activates receptors called cholinergic receptors. These receptors are abundant in the brain as well as in other areas of the body such as the muscles, heart, adrenal glands and other vital organs. Normally, these receptors are activated by the neurotransmitter acetylcholine which is produced at nerve endings in the brain and in the nerves of the peripheral nervous system. Acetylcholine stimulation of the receptors is involved in maintaining healthy respiration, heart function and muscle movement as well as cognitive functions such as memory. Since nicotine has a similar structure to acetylcholine, it can activate the cholinergic receptors.

**Common Side Effects:** Toxic effects of nicotine, Effect on coronary arteries, (ECG (electrocardiogram )

Deaths increase from sudden cardiac arrest (cardiac arrest). In fact, an electrical defect is attributed to heart diseases or heart diseases, or the exacerbation of the risk factors resulting from chronic diseases. Most cases, especially young people, accelerate the heart rate for many reasons, which shows (ECG) aerial fibrillation (AF), SVT supraventricular tachycardia, wolff-parkinson, VT

ventricular tachycardia) In addition to cardiac disturbances, either at the age of 40 years, heart disorders, ventricular hypertrophy of high blood pressure, Ischemia heart disease coronary plaque..) Early and periodic examination is to reduce and treat heart disease and eliminate risk factors that may lead to death.

**Table 1. Smoking patients, young people over the age of >25**

| **Gender** | **Risk factor pt.<br>( Smoking )** | **Patient with CHD<br>Number : 140** | **Healthy controls<br>Number : 65** |
|---|---|---|---|
| Men : YES<br>Woman : yes | Arrhythmias | Man : 30%<br>Woman : 25% | Man : 3 %<br>Woman : 2 % |
| | Tension headache | Man : 10%<br>Woman : 9 % | Man : 3 %<br>Woman : 2 % |
| | Variant angina( prinzmetals angina) | Man : 8%<br>Woman : 10 % | Man : 2 %<br>Woman : 3 % |
| | Hypertension | Man : 9 %<br>Woman : 8 % | Man : 3%<br>Woman : 1 % |
| | Respiratory disease | Man : 20%<br>Woman : 12 % | Man : 4 %<br>Woman : 3 % |
| | Hyperlipidemia | Man : 15%<br>Woman : 7 % | Man : 4 %<br>Woman : 3 % |
| | Polycythemia | Man : 15%<br>Woman : 0 0 % | Man : 4 %<br>Woman :00 % |
| | Depression | Man : 5 %<br>Woman : 5 % | Man : 2 %<br>Woman : 2 % |
| | Psychology | Man : 5 %<br>Woman : 5% | Man : 2 %<br>Woman : 1 % |
| | Sudden cardiac death | Man : 001%<br>Woman : 00 % | Man : 0001 %<br>Woman : 00 % |
| | Coronary disease | Man : 9 %<br>Woman : 4 % | Man : 2 %<br>Woman : 1 % |

**Table 2. Smoking patients over the age of > 40.**

| **Gender** | **Risk factor pt.<br>( Smoking )** | **Patient with CHD<br>Number : 282** | **Healthy controls<br>Number : 65** |
|---|---|---|---|
| Men : YES<br>Woman : yes | Arrhythmias | Man : 22 %<br>Woman : 19 % | Man : 5 %<br>Woman : 3 % |
| | Tension headache | Man : 5 %<br>Woman : 6 % | Man : 4 %<br>Woman : 3 % |
| | variant angina( prinzmetals angina) | Man : 10 %<br>Woman : 23 % | Man : 4 %<br>Woman: 6 % |
| | Hypertension | Man : 45 %<br>Woman : 32 % | Man : 12 %<br>Woman : 7 % |
| | respiratory disease | Man : 55 %<br>Woman : 15 % | Man : 10 %<br>Woman : 3 % |
| | Hyperlipidemia | Man : 42 %<br>Woman : 33 % | Man : 16 %<br>Woman 4 % |
| | Polycythemia | Man : 6 %<br>Woman : 001 % | Man : 9 %<br>Woman : 001 % |
| | Depression | Man : 7%<br>Woman : 5 % | Man : 3 %<br>Woman : 2 % |

***Cont...*** **Table 2. Smoking patients over the age of > 40.**

| | | | |
|---|---|---|---|
| | Psychology | Man : 6 %<br>Woman : 4 % | Man : 3 %<br>Woman : 1% |
| | Sudden cardiac death | Man : 2 %<br>Woman : 1 % | Man : 002 %<br>Woman : 001% |
| | lung and mouth cancer | Man : 5 %<br>Woman : 1% | Man : 1 %<br>Woman : 001% |
| | Coronary disease | Man : 45 %<br>Woman : 35 % | Man : 9 %<br>Woman : 5 % |

## Results

In the research we provided clear evidence of smoked exposure to cardiovascular disease. The risk of cardiovascular disease increased dramatically with age , We calculated the long-term risks of death from smoking for individuals of different ages and smoking status in terms of excess deaths that smoking contributed to, in addition to the primary deaths resulting from the same diseases caused by factors other than smoking using standard life schedule procedures. Because mortality data for specific categories of smoking were only available from future studies, we expanded their range to death levels. We have assumed, for lung cancer and heart disease among the most interested in expelling the specter of death, that death rates among non-smokers have not changed, and for other diseases related to smoking, the risk of death for smokers compared to non-smokers is clear. The possibilities resulting from alternative assumptions were also investigated and presented. Up to a third of heavy smokers who are 35 years old before the age of 80 will die from diseases caused by smoking. So according to the results first group young patients over > 25 years 30% of them had arrhythmias (arrhythmias, Palpitations, sinus arrhythmias, bradycardia, tachycardia, ventricular tachycardia, ectopic), 15% fat gain (LDL, HDL, TG, cholesterol), 10% psychology, polycythemia By 10% (increased hemoglobin blood), 10% from coronary artery disease, 20% from respiratory disease (chest, Lung, stomach and colon)), 5% high blood pressure, 5% depression , Group II: greater than > 40 years of chronic smoking 20% arrhythmia, 10% coronary artery disease, 5% polycythemia (increased hemoglobin in the blood), 25% of chest and organ diseases Respiratory, 9% of drug-resistant diabetes, 3% of lung and mouth cancer, 2% ASD, MI, 21 % increase in fat (LDL, HDL, TG, cholesterol), 5% of depression.

## Discussion

The risk of sudden cardiac death in smokers increases compared to non-smokers compared to the risks of myocardial infarction[9,10]. This may result from the combined effects of ischemia and the effects of nicotine irregularity[11]. The release of nicotine catecholamine can contribute to ventricular tachycardia and lethal fibrillation, therefore, I am using it in research to assess the important effects that the starting age of the individual cigarette smoking cycle can have and the health effects: (a) nicotine dependence, (b) number Cigarettes that are smoked daily (smoking intensity), (C) (likelihood of quitting smoking) or conversely, the likelihood of keeping a smoker), and (4) health outcomes. These four factors are closely related[12,13]. The dependence of nicotine is closely related to the smoking intensity, and both procedures in turn are linked to the possibility of remaining a long-term smoker. Factors: smoking intensity (number of cigarettes per day) and duration of smoking yen (number of years of smoking), as well as the effects of a lifetime cumulative exposure to cigarette smoking[14,15]. Much of the harmful health effects of cigarette smoking depends on a dose, we provide an automatic explanation of how a very early age from the beginning can strongly participate in the health effects of smoking that you mediate by increasing your exposure to cigarette smoke[16]. Cigarette smoke, and therefore, due to the relationships between dose and response, is expected to increase the risk of smoking diseases and deaths caused by smoking[17,18,19]. Another negative consequence of starting smoking at a young age is that tissues and organs of organs that are still in ripening and maturity may be particularly exposed to toxic substances in smoke[20,21], so that a certain dose of exposure to cigarette smoke is more harmful when exposed occurs during childhood and adolescence[22,23]. Puberty.

## Conclusion

Smoking cigarettes greatly contributed to the population burden of many of the leading causes of chronic disease deaths that usually occur in late and late adulthood, such as cancer, cardiovascular disease and chronic obstructive pulmonary disease , SCD indicates sudden cardiac death; and CHD, coronary heart disease (angina, myocardial infarction [MI], or coronary revascularization); Therefore, quitting smoking has an economic benefit, reducing medical effort, reducing deaths and spreading healthy culture among people.

**Conflict of Interest**: None

**Funding:** Self

**Ethical Clearance:** Not required

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# The Effect of Abuse of Some Anabolic Steroids on Hormonal and Testicular Function in Male Rats

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## Abstract

Anabolic androgenic steroids are complex molecules contain innate male hormone, the prolonged uses of these molecule cause destructive effects on health, thus, the investigation goals of this study to clarify the effect of high doses of anabolic steroids on follicle stimulating hormone (FSH), luteinizing hormone (LH),), testosterone hormone, prolactin and estrogen hormones levels, sperm parameters (sperm count, motility, abnormality and viability), also to clarify the effect on body **,**Epididymis and test weight. This study was carried out by treating rats with a high doses of anabolic steroids (testosterone and nandrolone) hormones. After 35 days of treatment ,the result indicated that ,there was a significant decrease in FSH,LH and testosterone hormones level while prolactin and estrogen will be increased, Although there was a significant decrease in sperm count ,motility and viability while abnormality will be increased ,body and test weight show statistically decrease.

***Key words:*** *Anabolic androgenic steroids, testosterone, prolactin*

## Introduction

Anabolic androgenic steroids (AAS), are a complex group of molecules that include both steroidal androgens such as testosterone and its related-precursors (dehydroepiandrosterone, androstenediol and androstenedione) as well as many different synthetic compounds, physiologically produced by adrenal cortex and Leydig cells in men and by corpus luteum, preovulatory follicles and adrenal cortex in women, testosterone is the major anabolic hormone in the human body [1–3], and original AAS. It functions by penetrating the cellular membrane of target cells and binding to an intracytosolic molecule [4]. The testosterone effects can be divided into two types: anabolic and androgenic. The anabolic effects include increased bone metabolism, muscular growth, collagen synthesis and nitrogen fixation. The androgenic effects include effects that correlated with male puberty such as effect on the hair growth, reproductive tract function, and sebaceous gland activity [5].

Beside the use of AAS in disease conditions, they are most frequently used in higher doses and for long durations among athletes [6,7], to improve body image (through an increase in muscle and/or decrease in fat mass) and also exercise performance [8]. The prolonged administration and/or using high doses of AAS were shown to compromise the function and structure of different organs such as, testis, kidney, heart and liver[9,10]. Exogenous testosterone provides in various preparations and each form carries various risks. Many men who take AASs are infertile because chronic AAS use suppresses spermatogenesis, this may relate to deficient of estrogen effect on the brain. Testosterone is aromatized to estradiol, and estradiol effects on the brain are very important for normal sexual function. Many AAS compounds are not aromatizable. In addition to oligomenorrhea and anovulatory infertility, women often develop clitoromegaly with chronic high-dosage of anabolic steroid use [11,12]. Testosterone is associated with hepatotoxic effects, the derivatives of alkylated testosterone are hepatoxic especially when taken orally [13]. Regarding the effects of endogenous sex hormones

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on the urinary markers of nephrotoxicity, an experimental study in rats investigate that, there was a significant association between testosterone and urinary excretion of leucine aminopeptidase, γ-glutamyl transpeptidase, alkaline phosphatase and β2-microglobulin, as biomarkers of kidney's proximal tubule [14]. The current study was designed to evaluate the effect of high doses of testosterone and nandrolone hormones on males sex hormones and sperm parameters in male rats as well as evaluate the effect on body, testes and epididymis weight after 35 days of treatment.

## Materials and Method

**1. Blood collection**

After 35 days of treatment by AAS, animals were anesthetized by intramuscular injection of ketamine 90 mg/Kg BW and xylazine 40 mg/kg BW. Blood samples were obtained via cardiac puncture technique from each anesthetized animals using disposable insulin needles. Sample were centrifuge at 2500 round per minute (rpm) for 15 minutes and then sera sample were stored in freeze at -18 c° till there use..

**2. Hormonal estimation**

Serum testosterone hormone concentration was determined by using Elisa kit(catlogMBS282195 from MyBiosource/USA) ,

Serum follicle stimulating hormone and Serum luteinizing hormone concentration were measured by using Elisa kits provide by( Human-Germany)

**3. preparation of Epididymal tail suspension**

The tail of epididymis of both sides were taken and embedded in one drop of phosphate buffer solution at 37 c° in a watch glass, and then the tail was cut into at least 200 section by micro-surgical scissors to perform the following microscopically examination on sperm characters[15].

4. Sperm function test

4.1.Sperm count

Sperm count was done according to[15], by using hemocytometer (neubauer type). The hemocytometer slide were filled with 5 microliter of sperm suspension and covered by cover slide, the sperm were counted in twenty-five small squares of the chamber. Estimation of sperm was made according to the following formula

Sperm con.= No. of sperm * 10

**4.2Sperm motility**

Sperm motility was assessed by methods described by [16]. Sperm motility percentage was assessed according to the method reported in this measurement is motility grade where the motility of sperm are divided into four different grade

**Grade A**: Sperm with progressive motility. These are the strongest and swim fast in a straight line.

**Grade B**: (non liner motility). These also move forward but tend to travel in a curved or crooked motion.

**Grade c**: These have non-progressive motility because they do not move forward despite the fact that they move their tails

**Grade D**: These are immotile and fail to move at all

**4.3 Abnormal sperm morphology**

To evaluate the abnormal sperm morphology, a drop of sperm suspension prepared was placed over the edge of slide and then a drop of easion-nigrosin stain was added and mixed, then two smear of each sample were prepared on microscopic slide. The smear of sperms were examined for abnormal morphology, 200 sperm were counted in each smears. The final percentage was calculated by estimating the average of two smears. Abnormal sperm morphology was calculated according to the following equation

Percentage of abnormal sperm= No. of morphologically abnormal sperm/Total sperm no. * 100

The morphologically abnormal sperms were estimated depending on sperm abnormality which had tapered head, tailless, coiled tail, bifurcated tail and broken tail[17]

**4.4 Sperm viability**

The assessment of alive and dead sperms was carried out by putting one drop of sperm suspension on a slide and a drop of easion-nigrosin stain was added and mixed.

Viable sperms repel the vital stain (easion-nigrosin), while dead sperm had lost the structural integrity of their plasma membrane and there for absorbed the dye ,for each sample two smears were made and 200 sperms were examined in each smear .Sperm viability was calculated as in the following equation

Percentage of dead sperms= No. of dead sperms/ total sperm No.* 100

**5. Testicular weight to body weight ratio**

After the end of treatment period (35 days), rats were weighed, anesthetized by intramuscular injection of ketamine 90 mg/kg BW and xylazine 40 mg/kg BW), and tests were excised and weighted by sensitive balanced after being cleaned from accessory connective and adipose tissue testicular weight to body weight as in the following equation

Relative weight = testicular weight (gm)/body weight (gm) *100

## Statistical Analysis

All data of the experiment were analyzed with one-way (ANOVA) by SPSS for windows (version 15) followed by LSD test. $P<0.05$ was assumed as statistically significant.

## Results

The results indicated that, the FSH, LH and testosterone hormones level showed statistically decrease while prolactin and estrogen hormones showed statistically increase after treatment by high doses of anabolic steroids compared with control, as shown in Table 1

**Table(1) the effect of some steroid hormone of body building on some sex hormones in male rats**

| Groups | FSH MIU/ l | LH MIU/ l | Testosterone ng/ml | prolactin ng/ml | Estrogen mlu/ml |
|---|---|---|---|---|---|
| **Control** | 3.10±0.32 a | 2.88±0.23 a | 3.06±0.47 a | 10.86±1.42 b | 8.34 ±1.57 c |
| **Testosterone cypionate** | 1.53±0.45 b | 0.92±0.11 c | 2.96±0.87 b | 15.59±2.08 a | 14.65± 3.37 a |
| **Nandrolone decanoate** | 1.56±0.09 b | 1.02±0.02 b | 2.52±0.09 b | 14.25±1.55 a | 12.25±2.54 b |

Table 2 illustrate a significant decrease in total count ,motility and viability in male rats after treatment by high doses of anabolic steroids while abnormality showed statistically increase compared with control groups

**Table(2) the effect of some steroid hormone of body building on sperm characterization in male rats**

| Group | Total count | Motility | Abnormality | Viability | MDA |
|---|---|---|---|---|---|
| control | 44.23 ±5.84 a | 92.14±4.72 a | 7.39±1.36 c | 90.12±5.62 a | 4.35±1.43 b |
| Testosterone cypionate | 35.46±4.55 b | 83.31±4.32 b | 18.37±0.95 b | 80.45±6.34 b | 6.93±1.58 a |
| Nandrolone decanoate | 30.76±3.52 c | 79.43±1.67 c | 20.38±2.62 a | 75.33±5.28 c | 7.43±0.96 a |

According to the body weight, the results indicated that, the high dose of steroid hormone cause a decrease in body, testes and epididymis weight as compared to the control group as shown in table 3

**Table(3) the effect of some steroid hormone of body building on weight in male rats**

| groups | Body weight (g) | Testes weight (g) | Epididymis weight (g) |
|---|---|---|---|
| **Control** | 240.94±3.07<br>a | 5.56±0.40<br>a | 2.81±0.13<br>a |
| **Testosterone cypionate** | 239.43±4.22<br>a | 3.34±0.28<br>b | 1.23±0.40<br>b |
| **Nandrolone decanoate** | 237.58±2.64<br>a | 3.92±0.68<br>b | 1.09±0.60<br>b |

## Discussion

The objective of this paper is to evaluate the effect of high doses of AAS on FSH, LH, testosterone ,prolactin and estrogen hormones, as well as estimate the effect on some sperm parameters and body, test and epididymis weight in male rats after 35 days of treatment. The present finding showed a significant reduction in FSH, LH and testosterone hormones levels while prolactin and estrogen showed significantly increase compared with the control groups .This may be due to the temporary impairment of AAS in the pituitary function reflected in decreased LH and FSH hormones levels and hence ereduced testosterone levels [18]. The use of exogenous hormone is thought to inhibit the production of gonadotropin-releasing hormone, which reduces the release of luteinizing hormones and subsequently reduces the production of testosterone [19]. It was again supported by an animal model study conducted in India, which showed adverse effects on testes caused by intraperitoneal injection of AAS, also these results investigated detrimental changes in the seminiferous epithelium of the testes and reduction in tubular diameter, resulting in lower pituitary gonadotropin (LH and FSH) and serum testosterone levels [20]. Furthermore, these effects result from that, high doses of AAS derivatives induces negative feedback on the hypothalamic-pituitary axis and reducing the secretion of LH and FSH. Spermatogenesis is dependent on the action of intra-testicular testosterone concentration and FSH on Sertoli cells. Within the seminiferous tubules, only Sertoli cells possess receptors for FSH and testosterone. Numerous signaling pathways are activated when FSH binds to FSH receptors on these cells, and acts synergistically with testosterone to increase the efficiency of spermatogenesis and fertility [21]. Infertility after AAS abuse commonly presents as azoospermia and oligozoospermia with abnormalities in sperm morphology and motility[22]. The hyperprolactinemia could also be the results of elevation in the prolactin levels through increased sensitivity to prolactin-releasing factor and prolactin inhibitory factor and from altered regulation of serotonergic and oradregneric neurons which in turn modulate dopamine release. Adding to that, seizures induce discharges in the neuron cell which stimulate the hypothalamus and increased prolactin secretion by the pituitary gland [23]. According to the present study there was a significant decrease in sperm count, motility and viability, the best explanation of this result may be related to apoptosis proses. Apoptosis has been reported to play an important role in the regulation of germ cell populations in the adult testis. The main basic cells which interrupted spermatogenesis are the Leydig, Sertoli cells and the germ cells. Each of these cell types in animals can be selectively affected by high doses of AAS leading to apoptosis [24]. Recently, the correlation between apoptosis and high AAS doses has been assessed in animal studies. AAS led to a deficient in the Sertoli cells activities, which lead to incomplete meiosis, failure of spermatogenesis, and stop of transition of spermatocytes to spermatids [25]. Shokri et al. report a significant increase in the rate of apoptosis of spermatogenic cells after nandorlone administration. Moreover, AAS

adversely affected sperm parameters by reducing sperm concentration and motility, increasing abnormal sperm morphology , sperm DNA damage and causing damage in the testicular structure of male rats, the mechanism of AAS toxicity in the male reproductive system arises from the alterations in hormonal status and promotion of oxidative stress [26].

Our finding clarified that, the body, test and epididymis weight decreased after 35 days of treatment by AAS, these results may be related to that, an excessive concentration of testosterone can inhibit growth and weight gain due to decreased appetite, electrolyte imbalance and increased lipid oxidation [27]. A study reported by [28] indicated that androgens inhibit the ability of some fat cells to store lipids by blocking a signal transduction pathway that normally supports adipocyte function. This might reduce the body weight gain. Also, AAS can decrease fat by increasing basal metabolic rate. The present work illustrated the extensive effects of AAS on male reproductive system of the rats**.** For this reason, drug-prevention counseling to athletes and teenagers is focused on the use of anabolic steroids.

**Conflict of Interest**: None

**Funding:** Self

**Ethical Clearance:** Not required

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# Study of a Hormonal Assay in PCOS Patients with Type 2 DM and their Correlation with Inhibin B

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## Abstract

**Background:** inhibin B considered a sensitive marker for follicles numbers of the ovary. Inhibin B levels increased with overnighted, lipedema and PCOS women. PCOS affects women in menstrual age. Obesity and insulin resistance have an association with PCOS. This syndrome increases LH, FSH, Prolactin. and testosterone hormonal levels.

**Aim:** examine the role of inhibin B in polycystic ovary syndrome (PCOS) with type 2DM patients, and to investigate the correlation between these quantities with serum inhibin B for women on the 12$^{th}$ day of their ovulation developments and correlation of inhibin with other biochemical parameters in those patients.

**Patient and Method:** sixty women included in this study divided into two groups of 30 subjects. The first group is for women who had PCOS with type 2DM, and the second for control subjects. PCOS with type 2DM patients diagnosed according to Rotterdam ESHRE/ASRAM. The biomedical test is done for FBS, Cholesterol, TG, LDL, HDL, HbA1c for all subjects included in this study.

**Results:** BMI, weight, prolactin and testosterone, FBS, cholesterol, TG, LDL, HDL, HbA1c had significantly higher levels in PCOS women with type 2DM. while inhibin B level showed to be significantly lower in PCOS with type 2DM. when this study attempted to find the correlation between the inhibin B with the biochemical tests, only the TG and HbA1c show a significant correlation in PCOS with type 2DM women.

**Discussion**: The high levels of biochemical parameters for diabetic female patients' groups with PCOS are due to the association of PCOS with insulin resistance and obesity. So, the low inhibin B levels in PCOS with type 2DM and its correlation with HbA1c and TG in the PCOS group could be an indication for using inhibin B as a type 2 DM marker. This study supported by Katrine et al 2017 when found out that when they diagnosed type 2DM at a younger age the levels of event rate (HbA1c and FBS) was higher in PCOS compared with controls

**Conclusion:** There is a significant correlation in inhibin-B levels with HbA1c and TG levels in PCOS women with type 2 DM.

***Keyword:*** *polycystic ovary syndrome (PCOS), Inhibin B, Triglycerides, LH, BMI, FSH*

## Introduction

Some women in reproductive age had one of the common endocrinal disorders characterized by the state of anovulation called polycystic ovarian syndrome (PCOS) which may persist for any length of time. androgen excess, infertility, menstrual irregularity, and insulin resistance may appear as an endocrinological feature for PCOS patients. PCOS is associated with insulin resistance and obesity [(1)]. It was found that ovarian inhibin exerts negative feedback on pituitary

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gonadotrophin production, preferentially affecting follicle-stimulating hormone (FSH) secretion, inhibin has been shown to impact basal secretion of both FSH and LH, as well as gonadotrophin-releasing hormone (GnRH)-stimulated FSH with the isolation of inhibin.

PCOS found to be related to lipid abnormalities, dyslipidemia, cholesterol, low density of lipoprotein and triglycerides. All these increases the risk of type 2 diabetes in PCOS women [(2)].

Inhibin's are disulfide-linked heterodimers composed of an α-subunit and either a $\beta_A$-subunit (inhibin A) or a $\beta_B$-subunit (inhibin B) which belong to the transforming growth factor β (TGF-β) super family [(3, 4)]. Inhibin negatively regulates the secretion of FSH (follicle-stimulating hormone), even if there is no direct evidence of this phenomenon as well as locally enhancing the follicle development leading to reverse the growth of small antral follicle [(5)].

The investigations over decades show that in both male and female, inhibin B plays a physiological role in reproductive endocrinology applications. In a female, inhibin B considered as an earlier marker and more sensitive for ovarian follicle number as it is directly secreted by the granulosa cells of the small, developing follicles of the ovary when a low level clinically suggests a premature ovarian failure [(6)]. The inhibin B levels increase when women affected with weight gain, anorexia nervosa and with an increase in adipose tissue and leptin levels [(7)].

Throughout the menstrual cycle different secretory patterns displayed in Inhibin A and B. Levels of inhibin B serum and follicular fluid reach to maximum in the early to mid follicular phases, most likely under the stimulation of FSH. The information about factors regulating the shift production of inhibin in when the follicle becomes dominant [(8)]. Inhibin B levels are found to be inversely correlated with Body Mass Index (BMI) in PCOS [(9,10)].

In this case-control study, we aimed to examine the role of inhibin B in polycystic ovary syndrome (PCOS) with type 2DM patients and to investigate the correlation between these quantities with serum inhibin B for women in 12$^{th}$ day of their ovulation developments and correlation of inhibin with other biochemical parameters in those patients.

## Patient and Method

This study approved by the scientific committee of the physiology department for al-Mustansiriyah college of medicine. The data of patients collected from Al-Yarmouk Teaching Hospital. Sixty females included in this study: 30 females are diagnosed as normal or control and 30 females with PCOS and with type 2DM. All patients examined with Ultrasonography on the 12$^{th}$ day of the menstrual cycle and diagnosed by a gynecologist according to Rotterdam ESHRE/ASRAM. To determine if female have PCOS, the doctor checked that whether they have at least 2 of these 3 symptoms:

1. Irregular periods or no periods, caused from lack of ovulation (amenorrhea or oligomenorrhea

2. Clinical Hyperandrogenism (acne, hirsutism)

3. Multiple small cysts on the ovaries found in ultrasound diagnosis.

The weight, height and Body Mass Index measured by electronic height and balance apparatus. The Biochemical tests include serum for Hormones of LH, FSH, Prolactin, and Testosterone. Biochemical tests for type 2DM are done which is: Fast Blood Sugar (FBS) , Cholesterol, Triglyceride (TG), HDL, LDL, HbA1c were measured by using KENZA 240 TX system (Bio IABO Diagnostics 2016) which is random access analyzers with microprocessor or control for measurement of lipid profile, HbA1c & glucose level. We use minividus for hormonal assay. All mentioned test is done for both control and diabetic PCOS groups.

## Statistical Analysis

Analysis of data was carried out using the available statistical package of SPSS-25 (Statistical Packages for Social Sciences- version 25). Data were presented in simple measures of mean, standard deviation and range (minimum-maximum values). The significance of the difference of means (quantitative data) was tested using Students-test for the difference between two independent means. The significance of correlations was tested using the Pearson correlation test. Statistical significance was considered whenever the P-value was equal to or less than 0.05 [(12-14)].

## Results

A. Comparison between control & PCOS with type 2DM groups:

Table (1) shows no significant difference between the two groups in age and height, while there is a significant difference between these two groups in weight, BMI and *p*-value (0.0001) for both of them. where the PCOS women with type 2DM tend to be obese more than the control group.

**Table (1) characteristic of control and PCOS with type 2DM groups**

| | **PCOS** | **Controls** | **P value** |
|---|---|---|---|
| Age (years) | 28.9±5.6 (20-40) | 29.1±6.4 (20-41) | 0.822 |
| Weight (kg) | 74.16 ± 10.29 | 59.66±70.01 | 0.0001* |
| Height (cm) | 160.26 ± 7.99 | 159.1±5.32 | 0.5155 |
| BMI (Kg/m²) | 28.9±3.5 (22.46-35.96) | 23.5±2.1 (19.72-28.84) | 0.0001* |
| *Significant difference between proportions using Pearson Chi-square test at 0.05 level | | | |

Table (2): shows that inhibin B levels had a significant difference in control (102.7±83.7) and PCOS group (58.6.6±356.4) with p-value 0.001. It appears that levels of inhibin B in PCOS women is less than control. While the level prolactin and testosterone are higher in PCOS women with PCOS with type 2 DM rather than control.

**Table (2): hormonal assay for control and PCOS with type 2DM.**

| | PCOS | Controls | P value |
|---|---|---|---|
| Inhibin B | ⁅58.6 ±35.6 (4 -100)⁆ | ⁅102.7±83.7 (15-400)⁆ | ⁅0.0001*⁆ |
| LH (µIU/ml) | 5.6±2.6 (1.2-10.1) | 5.0±1.3 (3.0-7.1) | 0.212 |
| FSH (µIU/ml) | 3.1±2.9 (0.1-12) | 3.7±0.9 (2.1-5.6) | 0.284 |
| Prolactin (ng/ml) | 31.3±14.6 (10-74) | 18.6±6.0 (8-31) | 0.0001* |
| Testosterone (ng/ml) | 0.7±0.3 (0.2-1.1) | 0.4±0.3 (0.05-0.9) | 0.0001* |

*Significant difference between two independent means using Students-test at 0.05 level

The tests of biochemical parameters for type 2 diabetes are listed in the table (3) it appears that all parameters are had a higher significant level in PCOS groups with significant value (p-value 0.0001).

**Table (3): biochemical test for control and PCOS with type 2DM**

| | **PCOS** | **Controls** | **P value** |
|---|---|---|---|
| FBS (mg/dL) | 128.4±35.1 (75-201) | 85.2±7.1 (72-100) | 0.0001* |
| HbA1c (mg/dl) | 7.97±1.29 (5.2-10.6) | 4.24±0.31 (3.7-5.0) | 0.0001* |
| Cholesterol (mg/dl) | 230.57±51.10 (170-344) | 155.37±19.72 (105-190) | 0.0001* |
| Triglycerides (mg/dl) | 226.57±58.05 (165-368) | 129.70±16.95 (100-155) | 0.0001* |
| HDL (mg/dl) | 55.87±7.85 (34-69) | 41.53±3.78 (32-50) | 0.0001* |
| LDL (mg/dl) | 170.03±35.77 (107-235) | 86.30±10.28 (65-101) | 0.0001* |
| -Data were presented as Mean±SD (Range) | | | |
| *Significant difference between two independent means using Students-test at 0.05 level | | | |

B. Correlation between inhibin B with parameters in PCOS type 2DM

The results of the correlation of hormone parameters with inhibin B for PCOS and Control groups listed in table 4. It appears that there is no correlation of mentioned hormones with inhibin B for both control and PCOS groups.

**Table (4): correlation between hormones parameters with inhibin-B for PCOS and Control groups.**

| | PCOS | | Control | |
|---|---|---|---|---|
| **Parameters** | **Correlation Coefficient** | **P-value** | **Correlation Coefficient** | **P-value** |
| LH | -0.0206 | 0 .9164 | 0.1877 | 0.3205 |
| FSH | 0.1031 | 0 .5877 | 0.0714 | 0.7077 |
| Prolactin | 0.1210 | 0.5241 | -0.1949 | 0.3043 |
| Testosterone | -0.0746 | 0.6975 | 0.0254 | 0.8940 |

* Pearson Correlation Coefficient Calculator at 0.05 level.

## Discussion

Researches proved that one of the most common endocrinal metabolic disorder is PCOS which affect female fertility [15,16]. Being overweight is associated with PCOS and appear also in diabetic patients [17, 18]. Patient with high weight and PCOS is correlated with type 2DM [19].

Weight, BMI, Prolactin, testosterone, FBS, HbA1c, Cholesterol, Triglycerides, HDL, LDL significantly higher level in PCOS women considered as predictors for PCOS T2DM development. These results supported with Bhanu Kalra et al 2010 [5] when they found that in PCOS HbA1c, fasting plasma glucose, 2-hour plasma glucose, triglycerides, age, and BMI upon baseline were predictors of development of T2D. When models were corrected for age and BMI, fasting plasma glucose, 2-hour plasma glucose, and triglycerides were the best predictors of development of T2D. Hussain et al 2013 [20] compared hormonal levels in PCOS with control for cortisol, and testosterone is significantly high in the PCOS group.

The PCOS women with type 2DM with included in this study have higher BMI, prolactin, and lipids upon PCOS diagnosis. The significant of biochemical tests of type 2DM is agreed with Abbasi A et al 2012 [21] and Selvin E et al 2010 [22] where FBS is applied in many prediction models for risk of Type 2 DM developing in non-PCOS populations as control with PCOS patients HbA1c is a measure of average glucose levels and an indicator for increased risk of T2D in PCOS. It considered a better predictor of cardiovascular disease and overall mortality than fasting or 2-hour glucose.

The FSH levels result show no correlation with inhibin B in PCOS. The negative correlation of FSH with inhibin B for PCOS group of patients gives an indication that this hormone cannot be used to diagnose PCOS with type 2DM. These results are in agreement with Torgac et al [23] when they found out that the basal inhibin A or B levels give a significant positive correlation with the PCOS group and a negative correlation with FSH levels. As the previous studies showed that during the follicular phase, inhibin B is more important than inhibin A [24].

Prolactin and testosterone levels are higher in PCOS patients with type 2DM which demonstrated as a frequent condition in most PCOS patients increase of basal Prolactin levels or of an increased reserve of Prolactin in the pituitary gland. Prolactin heterogeneity behavior in secretion is a characteristic of PCOS [24]. The result agreed with Richard et al 2013 who showed that PCOS patients had hyperprolactinemia other than control [25]. The results of negative correlation for Testosterone and Prolactin with inhibin B agreed with Corrine K. et al. 2002 which reveals the fact that they had no direct effect on inhibin B levels but suggesting a stimulatory effect of insulin on Prolactin and testosterone [26].

We find in this study a significant correlation between inhibin B with HbA1c and TG lipids in PCOS women with type 2DM. There was no similar study (as we know) support this finding, but Corrine k. 2002 found that there are significant relationships between inhibin B and BMI including LH, insulin & SHBG. Katrine et al 2017 found out that when they diagnosed type 2DM at a younger age the levels of event rate (HbA1c and triglyceride) were higher in PCOS compared with controls [27].

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding**: Self-funding

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# Estimation the Scavenging Activities of Ascorbic Acid, Uric Acid, Gallic Acid and GSH to DPPH Radical

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## Abstract

The "α,α-diphenyl-β-picrylhydrazyl radical **(**DPPH)" method from the estimation methods to determine the antioxidants activity in vitro, through the lowering the absorbance of DPPH with color changing from violet into yellow with increasing the strength of antioxidants activity. So, the results of this study show the uric acid is the strongest scavenging, then ascorbic acid when compared with other compounds used. But the reduced glutathione is the weakest although has acidic hydrogen.

***Keywords:*** *DPPH, scavenging activity, antioxidants, Ascorbic Acid, Uric Acid, Gallic Acid.*

## Introduction

The efficiency of antioxidants (scavenging activity) depends on the ability of free radicals scavengers (FRS) to given hydrogen to the free radicals [1]. The increase in rate and energy promotion for hydrogen ion transition from FRS to free radicals depend on the lowering in energy level for hydrogen bond with FRS. Efficient FRS results free radicals after donating hydrogen but not react rapidly with oxygen to produce superoxide. The efficiency of FRS as well depends on other factors as volatility, pH sensitivity and polarity [2].

In the present study, the antioxidants involve such as vitamin C, uric acid, gallic acid, and reduced glutathione.

Ascorbic acid (AA):

One from most powerful FRS [3,4]. It is found in several plants cells types. AA present in the reduced form under physiological conditions (90% of the ascorbate pool) in plants leaves and chloroplasts [5], were the concentration of AA (20 mM) in the cytosol, and (20-200 mM) in the chloroplast stroma [6]. The ability of AA to give the electron by many enzymatic and nonenzymatic reactions, therefore act as main detoxification antioxidants against ROS in the aqueous phase. So, the AA can directly be scavenging for singlet oxygen, superoxide radical, hydroxyl radical and reduced hydrogen peroxide to water by ascorbate peroxidase reaction [7].

AA capable to reduce tocopheroxyl radical into tocopherol that responsible about cell membrane protection. AA performs a number of non-antioxidant roles in the cells. It has been involved in the regulation of cell cycle progression from G1 to S phase, cell division, and cell elongation [8,9].

Glutathione (GSH):

"Tripeptide glutathione (□-glutamylcysteinylglycine)" is a plentiful compound in the tissues of plants. It is found in all compartments of the cell such as cytosol, mitochondria, and endoplasmic reticulum [10], were GSH has many roles in organisms such as storage for the sulphur, serve as precursors for phytochelatins, act as a detoxifier for xenobiotics via GSH-conjugation [11,12], and maintenance about redox form of the cellular membrane through (GSH-GSSG) system. Also, GSH has the ability to regulate gene expression. And regulation of cell cycle by GSH/GSSG system through -SH group [13,14].

GSH act as antioxidants through the nucleophilic center of –SH residue that responsible for higher reductive potential. So, its scavenger for singlet oxygen, superoxide radical and hydroxyl radical by non-enzymatic reactions, and with hydrogen peroxide and reducing to water by an enzymatic reaction [15]. GSH

has the ability to regenerate others antioxidants such ascorbic acid through the ascorbate-glutathione cycle [16,17].

Uric Acid (UA):

The final product of purine degradation in human and "Great Apes". It is a powerful scavenger for free radical such as singlet oxygen, hydroxyl radicals (.OH), and peroxyl radicals (RO. 2) [18,19]. In blood, stream urate considers from the major antioxidants against oxidative damage, so it is protected RBCs membrane from lipids peroxidation by scavenging oxygen radicals in aqueous media [20]. Uric acid some of the deleterious reactions, such as peroxide production by macrophages or autoxidation of haemoglobin [21].

In contrast, elevated the UA causes a lot of number from the epidemiology of hypertension [22], cardiovascular disease [23], visceral obesity [24], dyslipidemia [25], insulin resistance [26], kidney disease [19].

Gallic Acid (GA):

"GA is a 3,4,5-trihydroxybenzoic acid and its derivatives are widely spread in the plant kingdom and is a large family from secondary polyphenolic metabolites" in plants so it is from natural antioxidants [27]. GA present either methylated gallic acid form such as syringic acid, or in the orgalloyl conjugated form with catechin derivatives as "flanvan-3-ols, or in polygalloyl esters" form with glycerol, quinic acid or glucose [28].

The last two groups from "polyphenols are known as vegetable tannins, which their names derived from its ability to transform animal skins into leather" through the with collagen [29]. GA from the components of tea and some types of GA used as food additives to prevent peroxidation. Also, it is used in many phytomedicines due to its biological and pharmacological activities through the ability to free radicals scavenger [30], inducing apoptosis for the cancer cells [31,32], and inhibiting squalene epoxidase interfering the signal pathways involving calcium [33,34].

**α,α-diphenyl-β-picrylhydrazyl radical (DPPH):**

DPPH is described as relatively stable free radical due to delocalization phenomenon for the unshared electron overall whole molecule, so this radical do not suffer from dimerization as other radicals. The delocalization gives this radical the deep violet color when dissolved in absolute ethanol and absorbed at 517 nm. DPPH used to estimation the antioxidants activity for any sample or free radicals scavenging material [35].

## Material and Methods

**Prepared Serial Solutions:**

**Prepared Ascorbic acid solutions:**

This is done by dissolving ascorbic acid in distilled water (D.W.) as the following concentrations: 2.5, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70 mg/dl.

**Prepared GSH solutions:**

This is done by dissolving GSH in distilled water (D.W.) as the following concentrations: 2.5, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70 mg/dl.

**Prepared UA solutions:**

This is done by dissolving UA in distilled water (D.W.) (pH 8.5) as the following concentrations: 2.5, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70 mg/dl.

**Prepared GA solutions:**

This is done by dissolving GA in absolute ethanol as the following concentrations: 2.5, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70 mg/dl.

**DPPH procedure:**

**DPPH preparation:**

Prepared 0.1 mM from DPPH, by dissolving appropriate weight in absolute ethanol.

**Principle of method:**

The principle of this method depends on the reduce the absorbance values of DPPH after addition the sample due to conversion the violet colour into yellow colour depending on the antioxidants activity of the sample. The colour intensity measured at 517 nm (36) (figure 1).

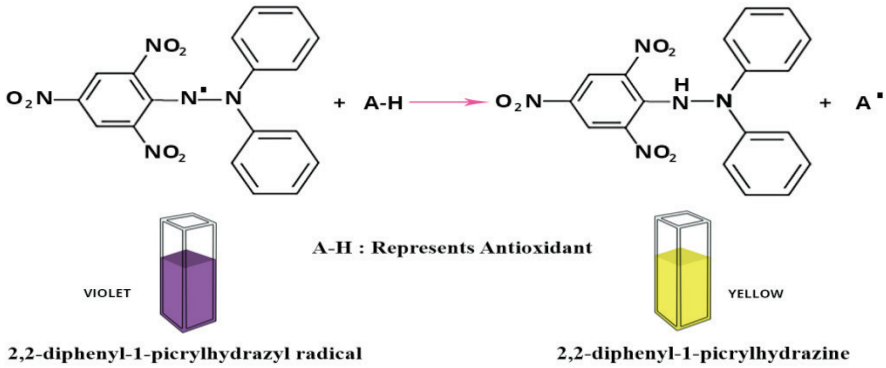


**Fig. 1: Reduction effect of AH to DPPH.**

**Procedure:** The procedure of addition as following:

| Reagent | Sample/µl | Blank/µl |
|---|---|---|
| DPPH | 1000 | 1000 |
| Sample | 100 | ------- |
| D.W. | ------- | 100 |

Incubate for 20 min at 25ºC. In the dark condition, then read the absorbance at 517 nm.

**Results and Discussion:**

The following results (Table 1) and (Figure 2) the inhibition values of DPPH by the antioxidants compounds. In other words, the absorption values for DPPH after scavenging by ascorbic acids, GSH, UA, and GA.

**Table 1: Absorption values for DPPH after scavenging by UA, GA, GSH, and ascorbic acid.**

| Concentration (mg/dl) of U.A, Gallic acid, GSH, Ascorbic acid | UA | Gallic acid | GSH | Ascorbic acid |
|---|---|---|---|---|
| 2.5 | 0.302 | 0.323 | 0.352 | 0.314 |
| 5 | 0.289 | 0.321 | 0.352 | 0.292 |
| 10 | 0.280 | 0.320 | 0.351 | 0.288 |
| 15 | 0.275 | 0.315 | 0.344 | 0.286 |
| 20 | 0.269 | 0.311 | 0.344 | 0.280 |
| 25 | 0.259 | 0.310 | 0.344 | 0.279 |
| 30 | 0.251 | 0.303 | 0.343 | 0.274 |
| 35 | 0.247 | 0.291 | 0.343 | 0.268 |
| 40 | 0.243 | 0.290 | 0.343 | 0.261 |
| 45 | 0.238 | 0.289 | 0.332 | 0.254 |
| 50 | 0.211 | 0.262 | 0.332 | 0.238 |
| 55 | 0.193 | 0.249 | 0.332 | 0.226 |
| 60 | 0.169 | 0.232 | 0.332 | 0.212 |
| 65 | 0.145 | 0.221 | 0.332 | 0.195 |
| 70 | 0.123 | 0.214 | 0.332 | 0.185 |

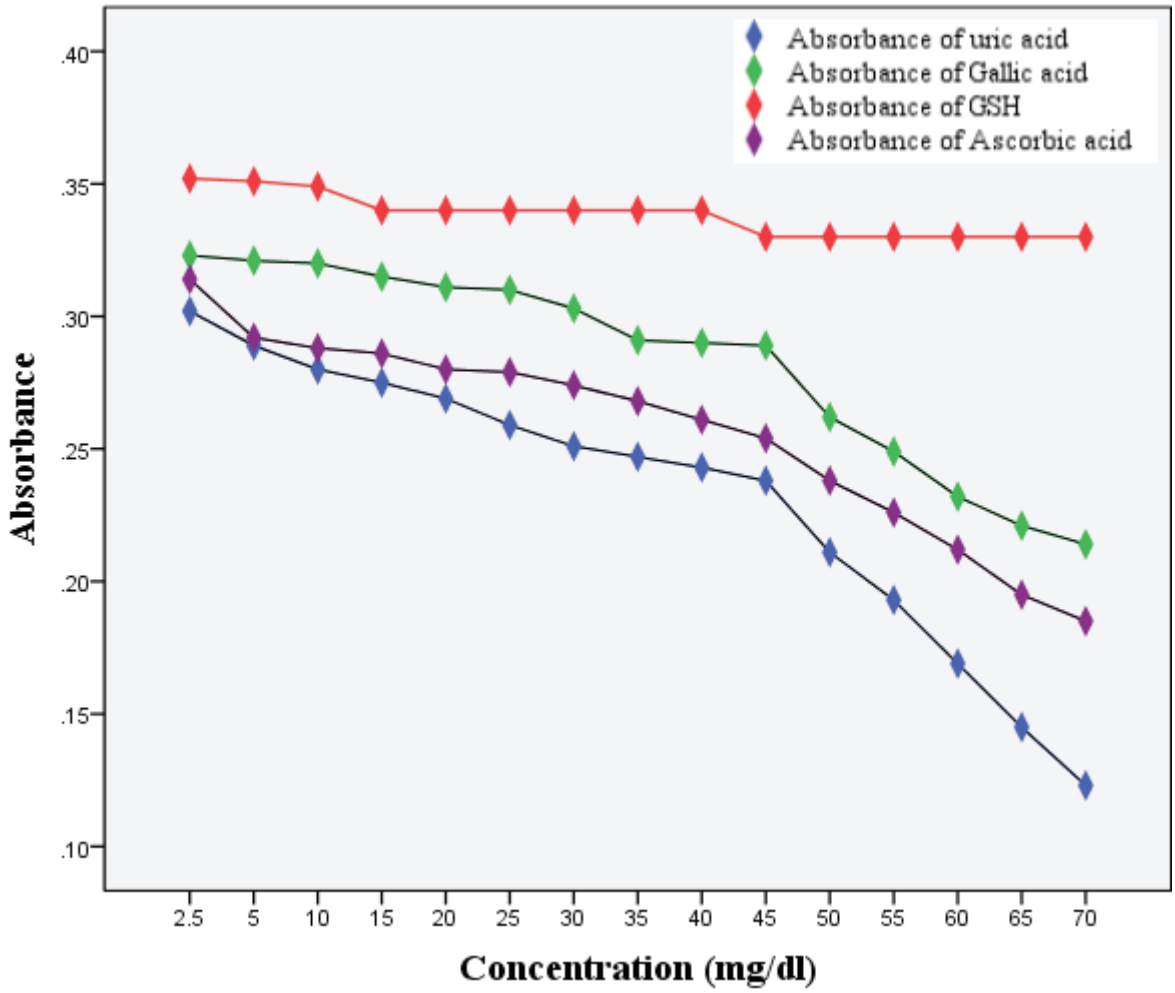


**Fig. 2: Decline in absorption values for DPPH after scavenging by UA, GA, GSH, and ascorbic acid.**

The scavenging effect for UA toward DPPH is more than other antioxidants were used in this study when compared in the same concentrations, may be due to the heterocyclic ring effect that responsible about delocalization and lowering energy of hydrogen bond with the compound (figure 3).

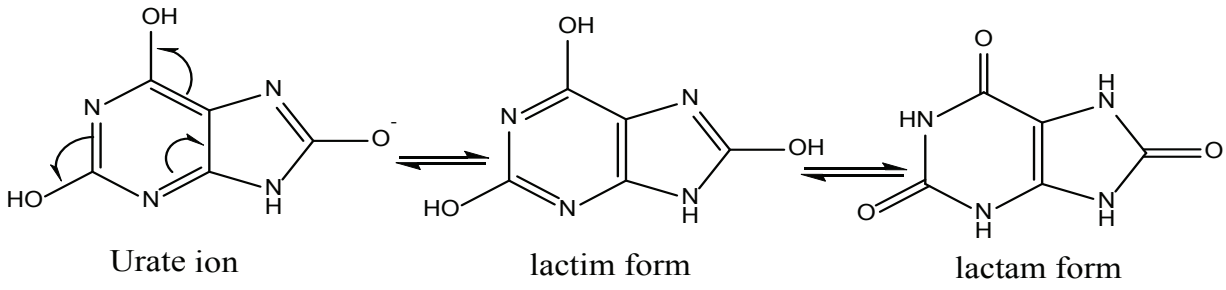


**Fig. 3: Urate tautomerism**

From the results show a slight decrease in the line chart (figure 2) for the GSH value, this means it is the weakest scavenging compared with other compounds used in this study may be due to the energy bond of hydrogen in the thiol group is relatively strongest than other compounds, therefore no change in the color of DPPH. However, the scavenging effect increased with an increase in concentrations of these antioxidants compounds.

## Conclusion

In conclusion, the strongest scavenging in vitro the compounds that have the ability to reduce the DPPH and change its the color from violet into yellow, therefore the scavenging strength follow the sequence UA, AA, and GA, where the GSH is very weakest scavenging to DPPH at the same concentrations.

### Ethical Clearance

The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

### Conflict of Interest

The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# Histological Investigations for Cordia Myxa During the Treatment of Gastritis in Local Rabbits

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## Abstract

**Background**: The goal of this study was to evaluate the effect of medical fruits, through $H^+$ proton pump inhibitors and observation to main of histological changes accompanying for treatment. **Methods**, Adult domestic healthy rabbits, all experimental animals were adapted in animal house. Animals were taken for this study distributed into three group, control (5 ml/kg b.w) gastritis (10% glacial acetic acid 1ml//kg b.w) and treatment group (5 ml/kg b.w) oral administration during 21 day for 3 time daily.

**Results**: the main histological observations for effects of (Juicer fruit Bumper) during induce inflammation by 10% acetic acid, after 4hr showing the inflammation region in internal surface in fundic region but most of internal surface it's normally. Histologically, the stomach of gastritis group was observed the erosion in epithelia surface and congestion of blood vessels, gastric pits disappear but most of changes which accrue in lamina propria generally. The rabbits of treated group was observed reductions in inflammatory area, with some extent of mucosal regeneration (re-epithelization) and the parietal cells appeared a granular cytoplasm and proliferation of connective tissue cells (granulation tissue).

**Conclusions**: these findings suggest that (Cordia myxa) considered perfect anti-inflammatory and H+ proton inhibited pump.

***Keywords**: Histological, Cordia myxa, anti-inflammation, rabbits*

## Introduction

Centrally the Myxa Cordia L. known as "Bumber" is commonly used for its role in chest and urinary tract infections )1( . This is also used for its effects as anthelmintic, antigastritic, diuretic, antidiarrheal, antiworm or even as a tonic to the liver. In conventional medicine certain Cordia species compounds were used in osteoarticular diseases. Analgesic, antiarthritis , anti-inflammatory and of C. Dear myxa, C. C'est francisci, C. Martiniquez, C. Serratifolia, with C. The ulmifolia was found in rats (2). Petroleum ether extract, especially of C. francisci, C. myxa and C. serratifolia leaves has been reported to carry significant analgesic, anti-inflammatory and anti-arthritic activities (3).

Most of the population of the world depends on traditional medicine and conventional medicine's major role including the use of plant extract and its active ingredients. (4,5) Medicinal plants in Iran were commonly used in folk medicine for the treatment of diseases. Herbal medicines have drawn scientists and physicians ' attention nowadays due to the excessive use of medications and synthetic drugs contributing to health hazards (6). The high resistance to injury depends on a variety of physiological responses from the mucosal lining to potentially harmful luminous agents as well as on the ability to quickly restore mucosal damage when it occurs (7). However, when the injurious factors overwhelm these protective mechanisms, a gastric mucosal lesion may develop. Through a variety of local

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and systemic mechanisms, these drugs can not only exert gastric injury effects, but also delay the healing of ulcer lesions [8]. The use of proton pump inhibitors represents another important issue about the integrity of gastric mucosa. Such medications have been shown not only to avoid upper gastrointestinal injury caused by NSAID, but also to facilitate the recovery process once the damage has occurred, even in the presence of a continuous treatment of NSAID [9].

The aim of this study explained the effects of Cordia myxa fruit on experimentally induced gastritis in rabbits and showing main of histological changes in stomach.

Materials and methods:-

Eighteen healthy rabbits for both sex were chosen and divided in to three groups (control group G1, inflammatory group G2, treatment group G3). Weight of animals (850-1100) g, breed locally, were used in this study. Control group (5ml/kg b.w), Gastritis group were given 10% glacial acetic acid directly in stomach by small stomach tube, after 20 minute water administrated for acidity decrease (1ml/kg b.w) and treated group administrated by bumper fruit (5 ml/kg b.w) oral administration during 21 day for 3 time daily [10]. The tissue specimens were sectioned from the fundic region. The size of the specimens were taken about 1 cm and then kept in 10% formalin for 48 hours. The samples were proceeding with routine histological technique [11].

## Results & Discussions

The present study showing the stomach of rabbits consist of three regions, cardiac, fundic and pyloric region, each area had characteristics different from other. Generally, the stomach consists of four basic layer; mucosa (epithelia, lamina propria and muscularis mucosa), submucosa contains loose connective tissue, elastic fibers and blood vessels, tunica muscularis consisting of smooth muscles fibers and tunica serosa. These results akin with [12] who describe that the histological structure of stomach in lab animals consist of four basic layers in all regions of stomach.

### Control group

The current study showing, the epithelial of fundic region consists of simple columnar epithelia without goblet cells, gastric pits were oval shape and normal state occupied by gastric glands, thickness of gastric pits was (90) µm. the distribution of simple tubular gastric glands were regular, the parietal cells oval or pyramidal in shape fill with granules with rounded nucleus located in central of cells. These consequences agree with [13] who noticed that the fundic region of stomach in domestic animals lined by simple columnar epithelia and glandular region consist of parietal and chief cells spread as a cord like. (Fig,1,2)

### Gastritis group

In current study, the characteristic histological examination of acetic acid induced gastric inflammation, showing damaged mucosal epithelium, distortion of glands. This study was observed the erosion in epithelia surface and congestion of blood vessels, gastric pits disappear but most of changes which accrue in lamina propria generally. This finding comparable with [3] who stated that the acetic acid causes the local inflammation during gastrointestinal tract.

also showing the present large numbers of parietal cells characteristic by polyhedral or oval in shape, have strong affinity had highly granules in cytoplasm, dark nucleus and aggregation in many group and form the circles, reach in epithelial surface with present of severe inflammatory infiltrate, proliferation of fibroblasts. These results showed congestion area located under tunica mucosa. The parietal cells that located in epithelial surface illustrated as circles and increase in number but chief cells less than its. These consequences similar with [14] who describe that the parietal cells become fill with granules during too much of acidity (Fig,3,4).

### Treatment group

In this study, the Gastro -mucosal changes at four weeks revealed complete healing in treated with (Juicer fruit Bumper) this finding showed regeneration to epithelial surface and consist of gastric pits a normally and increase in length about (170) µm, reduce in congestion areas. The stomach in treated group lined by a simple columnar epithelium with a lightly stained cytoplasm. The general histological appearance of parietal cell which serialized arrangement, decrease in number if its compared with inflammatory group, have pink lightly cytoplasm, decrease in cytoplasm granules. The present study showing the submucosa become

dense and contains a large amount of collagen fiber which filled the space. In current study First registered, the Cordia myxa fruit act to inhibitors proton pump by reducing quantity of acid in stomach during in active of parietal cells), this result comfortable with [15] who stated the parietal cells after treated with Rabeprazole appearance under regenerate epithelia and have purple cytoplasm due to decrease secretion of hydrochloric acid ( Fig, 5,6).

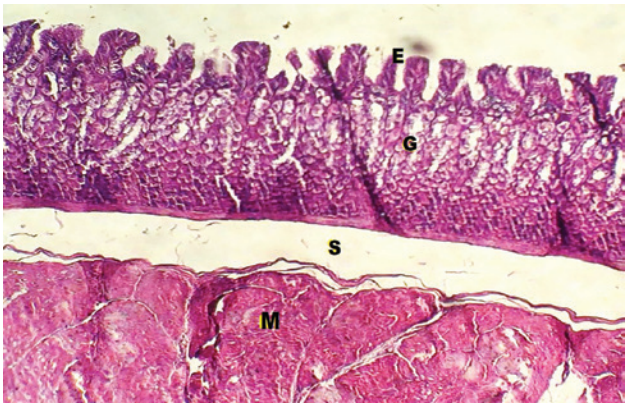


**Figure: 1. Stomach of control group shows the normal E-Epithelia, G-Glandular region, S-Submucosa and M-Muscularis. H&E stain.40X.**

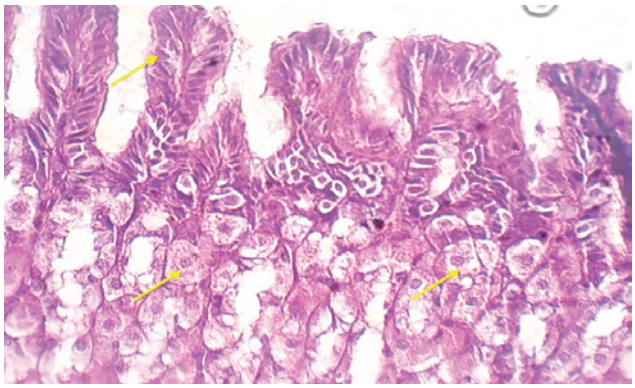

**Figure: 2. Stomach of control group shows the simple columnar epithelia (black arrow) and normal state of parietal cells oval in shape (yellow arrows). H&E stain.400X.**

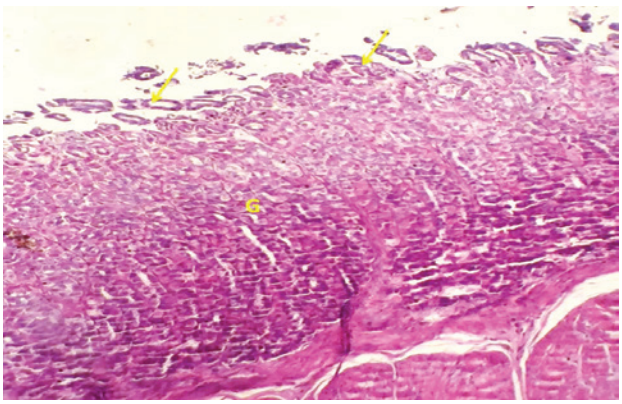


**Figure: 3. Stomach of gastritis group shows the damage of epithelia (yellow arrows) and the distribution of glandular cells randomly, G- Glandular region. H&E stain. 40X**

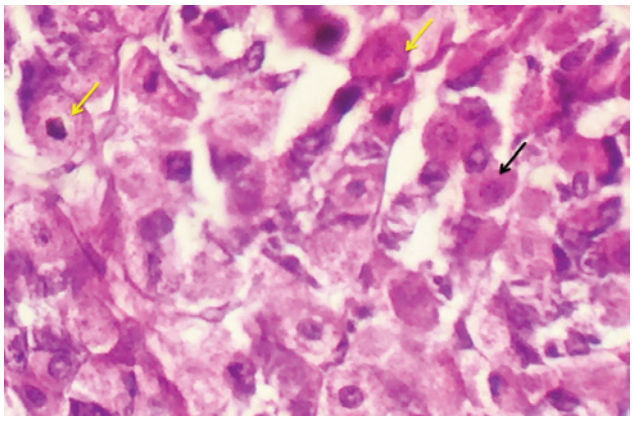

**Figure: 4. Stomach of gastritis group finding the dark and highly granular of parietal cells (yellow arrows) and pyramidal chief cell (black arrow). H&E stain. 400**

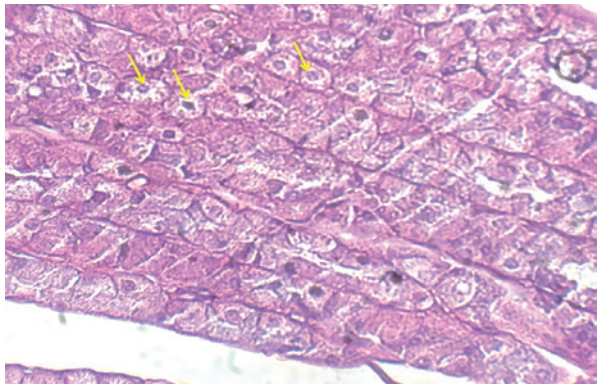

**Figure: 5. Stomach of treatment group finding the regenerated of high epithelial layer (yellow arrows) and glandular cells spread as a cord like (black arrows). H&E stain. 40X.**

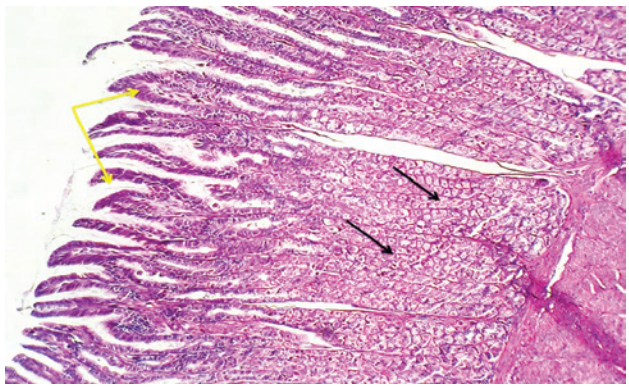

**Figure: 6. Stomach of treatment group shows the parietal cells appeared light and purple cytoplasm (yellow arrows). H&E stain. 400X.**

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest**: Non

**Funding**: Self-funding

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# Frequency of Aspirin Misuse Among Hypertensive Patients in Babylon Province

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## Abstract

**Background**: Hypertension endangering a risk of cardiovascular events and BP reduction will reduce such complications. the role of aspirin in hypertension is debated, however it is advised in primary prevention in case of patient with high risk factors assessed by one of the cardiovascular risk calculator, a state in which the benefit of aspirin outweigh the risk of complications.

**Objectives:** Estimate the prevalence of aspirin misuse in hypertensive patients ,which population at risk and estimate the possible source of this misuse habit.

**Patients and Methods:** A cross sectional study that has been conducted in babil city major hospitals for the period from the 20th of January to 2nnd of May. our study sample included 353 patients all cases were between 35 to 75 years old who attend to internal medicine outpatient clinic , emergency departments and inpatients of the above hospitals . All patient had hypertension being treated with antihypertensive agents and they did not experience any vascular events like CVA, IHD and PVD**.**

**Results:** 30.59% of patient do not use aspirin and 64.31 % of patients use aspirin prescribed by doctors. Most of aspirin use was according to doctor advice( 92.7%). 5.1 a use aspirin by advice from others. Aspirin use was more with increased age group (p value 0.003) and in females( p value is 0.04). No significant differences between educational level, economic status, residency and occupation with the use of aspirin. Regarding aspirin intake by their doctors and score <10 %: women were more than men ,age 40 – 60 years. Mostly were urban, higher education of 50% had positive history of CVD. Patient who need aspirin but they didn't use aspirin, were 66 patients mostly male live in urban area higher education , smoker , most of them had no family history of cardiovascular diseases.

**Conclusion:** Aspirin use requires coordinated interaction between patient and physician with encouraging the importance patient education about aspirin use, side effects and CVD risk and proper evaluation of patients risk factors and stratification using simplified charts accessible in health centers.

***Key words:*** *Aspirin, primary prevention, hypertension.*

## Introduction

The CVD risk associated with hypertension depend on multiple factors including age, gender, in addition to BW ,physical activity, cigarrete smoking, family history of hypertension , high cholesterol level, DM and preexisting vascular disease(1). Assessment of the risk of future CVD is an important step in patients requiring primary protection from any vascular events(2) . However, to determine the role of aspirin's in prevention of CVD, both primarily and secondarily the benefits should be balanced against the complications(3).The net benefit of aspirin in patients with known risk factors is clearly evident(4) . For primary protection ,guidelines vary about whether, and to which groups, aspirin is to be given(5) in that context, physicians should evaluate the risks and benefits of aspirin therapy for those patients free of risk factors (6)

Primary cardiovascular (CV) prevention defined as the use of pharmacological and/or nonpharmacological measures as prophylaxis of atherosclerosis to prevents

MCEs in in the absence of any history or clinical signs of underlying disease. The main outcomes to be measured are MI, stroke, and death from CVD. In addition to other outcomes including hospital admission , intervention of coronary disease, incident angina, all-cause mortality are sometimes added as ancillary end points these are applied to apparently healthy persons[7].

For the calculation of an individual probability to develop CVD all factors that contribute to the risk must be taken into account, including previous CVD events[8]. Many risk calculators are currently available that help in the detection of population at risk of developing CHDs[9].

**Patients and method**

A cross sectional descriptive study was conducted in Babylon city hospitals including al hila teaching hospital, marjan medical city and imam al sadiq teaching hospital. For the period from the 20th of January to 2nnd of May. This study has been done on patients diagnosed by their doctor having high blood pressure and take medication for it.

The data was collected using a preformed questionnaire by which the patient was interviewed after giving appropriate verbal consent .Each patient was interviewed for about 15 minutes

The questionnaire include the following Parts : Patient sosciodemographic characters (age, gender, residency, educational level, economic status, occupation and marital status,the parameters related to 10 years cardiovascular risk score, the protocol of study was approved by ethical committee of Babylon university, college of medicine. Appropriate verbal consent was taken from the patients before the interview. Confidentiality of patients data was approved by replacing names by numbers. To accomplish the study official agreement was taken from Babylon health directorate.

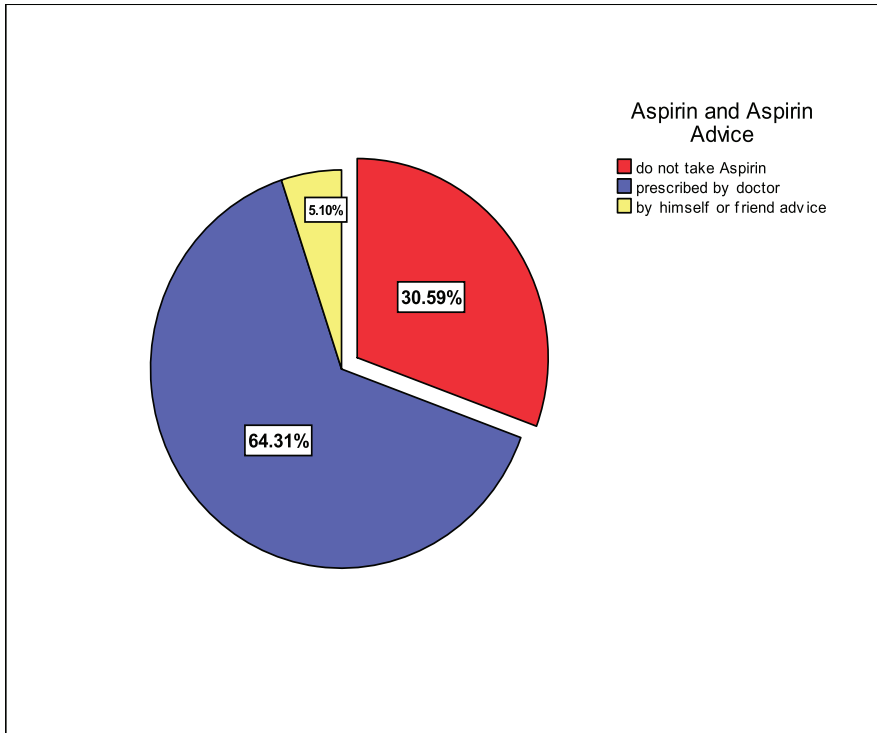
## Results

Table (1) shows the sociodemogrphic distribution of the study sample and the association with the habit of taking aspirin. The association between the age group and the use of aspirin was significant in which p value was 0.003. In which aspirin use was more with increased age group, also the association between gender and use of aspirin was significant when aspirin use was more in females p value is 0.04.

**Table (1): the association between sociodeogrphic characteristics of the patients and aspirin taking.**

| Characteristic | Group | Use Aspirin | Not users | P value |
|---|---|---|---|---|
| Age | up to 40 years | 4 (80.0%) | 1 (20.0%) | 0.003* |
| | 41-60 years | 144 (63.2%) | 84 (36.8%) | |
| | more than 60 years | 97 (80.8%) | 23 (19.2%) | |
| Gender | male | 159 (66.0%) | 82 (34.0%) | 0.04* |
| | female | 86 (76.8%) | 26 (23.2%) | |
| Residency | urban | 206 (69.1%) | 92 (30.9%) | 0.792 |
| | rural | 39 (70.9%) | 16 (29.1%) | |
| Education | no or primary education | 74 (68.5%) | 34 (31.5%) | 0.810 |
| | medium or high education | 171 (69.8%) | 74 (30.2%) | |
| Occupation | employed | 98 (65.3%) | 52 (34.7%) | 0.157 |
| | worker | 66 (68.0%) | 31 (32.0%) | |
| | no job | 81 (76.4%) | 25 (23.6%) | |
| Economic status | good | 192 (66.9%) | 95 (33.1%) | 0.051 |
| | fair | 46 (78.0%) | 13 (22.0%) | |
| | not enough | 7 (100.0%) | 0 (.0%) | |

**Figure (1): Distribution of Aspirin prescription in total sample**




**Table(2) Sociodemographic distribution of aspirin misuse by doctor prescription.**

| Characteristic | | Group | frequency | percent | total |
|---|---|---|---|---|---|
| Age | | 41-60 years | 24 | 63.2 | 38 |
| | | more than 60 years | 14 | 36.8 | |
| Gender | | male | 18 | 47.4 | |
| | | female | 20 | 52.6 | |
| Residency | | urban | 21 | 55.3 | |
| | | rural | 17 | 44.7 | |
| Education group | | no or primary education | 17 | 44.7 | |
| | | high education | 21 | 55.3 | |
| Occupation | | employed | 9 | 23.7 | |
| | | worker | 14 | 36.8 | |
| | | no job | 15 | 39.5 | |
| Marital status | | married | 29 | 76.3 | |
| | | single | 9 | 23.7 | |
| Family history of hypertension or other CVD | | 19 | 50.0 | 50.0 | |
| | | 19 | 50.0 | 50.0 | |
| Diabetic | yes | 8 | 21.1 | 21.1 | |
| | no | 30 | 78.9 | 78.9 | |
| smoker | yes | 5 | 13.2 | 13.2 | |
| | no | 33 | 86.8 | 86.8 | |

**Table(3)Sociodemographic distribution of aspirin misuse by patients.**

| Characteristic | | Group | | frequency | percent | total |
|---|---|---|---|---|---|---|
| Age | | Up to 40 years | | 4 | 44.4 | 9 |
| | | 41-60 years | | 5 | 55.6 | |
| Gender | | male | | 5 | 55.6 | |
| | | female | | 4 | 44.4 | |
| Residency | | urban | | 9 | 100.0 | |
| Educational level | | high education | | 9 | 100.0 | |
| Occupation | | employed | | 9 | 100.0 | |
| Marital status | | married | | 7 | 77.8 | |
| | | single | | 2 | 22.2 | |
| Family history of hypertension or other CVD | | yes | 9 | 100.0 | | |
| Diabetic | yes | 7 | | 77.8 | | |
| | no | 2 | | 22.2 | | |
| smoker | yes | 2 | | 22.2 | | |
| | no | 7 | | 77.8 | | |

**Table(4)Sociodemographic distribution of non-user**

| Characteristic | | Group | frequency | percent | total |
|---|---|---|---|---|---|
| Age | | Up to 40 years | 1 | 1.5 | 66 |
| | | 41-60 years | 46 | 69.7 | |
| | | More than 60 years | 19 | 28.8 | |
| Gender | | male | 51 | 77.3 | |
| | | female | 15 | 22.7 | |
| Residency | | urban | 56 | 84.8 | |
| | | rural | 10 | 15.2 | |
| Educational level | | high education | 45 | 68.2 | |
| | | no or primary education | 21 | 31.8 | |
| Occupation | | employed | 30 | 45.5 | |
| | | worker | 19 | 28.8 | |
| | | No job | 17 | 25.8 | |
| Marital status | | married | 56 | 84.8 | |
| | | single | 10 | 15.2 | |
| Family history of hypertension or other CVD | | yes | 28 | 42.4 | |
| | | no | 38 | 57.6 | |
| Diabetic | yes | 32 | 48.5 | | |
| | no | 34 | 51.5 | | |
| smoker | yes | 46 | 69.7 | | |
| | no | 20 | 30.3 | | |

## Discussion

Hypertension causes cardiovascular and renal. Thus decreasing blood pressure reducing morbidity and mortality. The effect of aspirin on control of BP is still a matter of debate[10]. Regarding the use of aspirin in healthy or apparently healthy people as primary prevention , there are no direct proofs of its efficacy, but in low-risk populations it may be of no benefit or may be risky[7]. In 2016, the (USPSTF) recommendations about aspirin use in primary CVD prevention in has been updated . (11).They adopted a calculator derived (ACC/AHA) for assessment of 10-year risk for first hard atherosclerotic CVD event (non-fatal MI,CHD, death, and fatal or nonfatal stroke)[12].

The study dealt with patients sociodemograhpic characteristics and its association with the habit of aspirin use. The age and the use of aspirin was significantly associated, in which aspirin use was more with increasing age , in those whose ages more than 60 years (120 patients) 97 of them taking aspirin p value 0.003. In a study conducted in Canada that prospectively enrolled 3015 patients without any previous CVS diseases for aspirin use as primary protection , when compared with their counterparts, the study found that ,

peoples receiving aspirin were older their ages in years was 61.6±8.4 vs. 55.5±8.1 with (P<0.0001)[13]

A significant association was also found between gender and use of aspirin in which aspirin use was more in females patients with p value is 0.04. A similar results was found by a study of mendy et al in USA on the aspirin use in primary protection in patients without prior CVS diseases, they found that aspirin use was more in female(45.9% ) than in male(39.1% )[14] .This may because of female in our communities look for and afraid more about their health status. The study found that there was no significant differences between educational level, economic status, residency and occupation with the use of aspirin. P value > 0.05.

The study evaluate the relationship of the effect of the score value of the patients and the indication of aspirin use according to score. From the total number of the patients taking aspirin ,19.2 % of them regarded as a misuse of aspirin , which include 17.6 % whose score is below 10 and their age is more than 40 years, and 1.6 % include patients with age below 40 years that is age not assessed by the score. 80.8 % of patients taking aspirin according to score. These findings were approximately similar to a study done by Vanwormer and his associates was done to find the relationship between; specific sociodemographic variables, and aspirin use among a representative sample of Wisconsin adults without CVD, and found that the percentage of regular aspirin intake in those without indication to take it was 18% (102 patients from the **563** patients) [15].

This study evaluated the distribution of patient who take aspirin prescribed by their doctors and their risk score was less than 10 %. Women were more than men and age between 40 – 60 years most of them were urban with medium to higher education half, of them had positive family history of cardiovascular diseases. In a study done by Vanwormer and his associates, they concluded that Aspirin intake was less by patients at high CVD risk which may have a cardiac protection effect from regular use of aspirin and excessive use in patients at low CVD risk. (15). These findings may be due to our patients themselves not complying with their following physician instruction or visiting not a specialist medical physicians with limited knowledge about the risk assessment. So to make any decision for aspirin prescription should fellow an individual clinical judgment that balance the benefits of cardio protection and bleeding risk. Patients with a higher CVD risk, have a greater benefit from aspirin. This final judgment to start aspirin therapy continuously should be made by health care personnel's , especially Primary Care Physicians (PCPs) in resource-poor areas, and they must have a knowledge about their role in assessing the benefit and risk of bleeding. [16]

The study show the distribution of patient who take aspirin. which included 5 patients their risk score was less than 10 %, and 4 patient had not included in the score whose age below 40 years. Male were predominant live in urban area, all of them were highly educated employed, also most of them had history their family of CVD, this is may be due to educated people be more aware about cardiovascular diseases. In the study of roth et al, performed in an urban county African –Americans and Hispanic adults where the quality of health care delivery should be high , they found that aspirin intake was insufficient with high risk patients for CVD and routinely used by many patients at low CVD risk [17].

This study shows the distribution of patient who need aspirin but they didn't use aspirin , they were 66 patients mostly male live in urban area.

Higher education , smoker , most of them had no family history of cardiovascular diseases. In a study done by Im et al which was conducted for assessment of the 10-year (CVD) risk and to set for the application of the current requirement on aspirin use for primary protection in Korean participants, and according to 2016 recommendation of (USPSTF), aspirin in their study was indicated in 266 participants (23.6%), but only 44 participants of them (3.9%) were on regular intake of aspirin . Among these who participates in their study, aspirin was prescribed in proper way in 36% of the participants, suggesting that only 6% of the participants were taking aspirin appropriately and 3.3% of them were taking aspirin inappropriately [18]

**Ethical Clearance**

The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

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# Estimation of Antioxidants Activity Through DPPH Inhibition Levels in Patients with Chronic HPV 16 Cervicitis

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## Abstract

In the present study, the DPPH scavenging activity from the primary methods to estimation the antioxidants activity in the body by an inverse relation between them. So, the levels of DPPH scavenging activity is reduced in the patient with HPV16 genotype chronic cervicitis (G3= 43.01±2.74 in the serum, G3= 9.73±1.53 in the mucus) and without (G2= 47.22±4.50 in the serum, G2= 15.51±1.41 in the mucus)compared with healthy women (G1= 64.79±4.87 in the serum, G1= 21.24±3.62 in the mucus), this is a return to lowering antioxidants in the patients compared with healthy women. The deterioration in the antioxidants levels can cause cancer in the future or delay the response of the medication to inflammation.

***Keywords:*** *DPPH, Antioxidants activity, Chronic cervicitis, HPV, cervical cancer.*

## Introduction

Chronic Cervicitis from the widespread diseases in gynecology, caused by delayed treatment or diagnosis [(1,2)]. From the clinical symptoms for this disease include abnormal vaginal discharge, lower genital pain and constant lochia. chronic cervicitis occurs due to infected cervical by a pathogen [(3,4)]. Human papillomavirus (HPV) is a common pathogen that causes chronic cervicitis. The high-risk HPV (HR-HPV) is more than 180 genotypes that cause squamous epithelial hyperplasia because of the DNA of HR-HPV have the ability to synthesis oncoproteins that cause inhibition to tumor suppressor proteins such as "p53 and retinoblastoma protein (pRb)". So, the infected by HR-HPV can lead to "cervical intraepithelial neoplasia" or cervical precancerous lesions [(5,6)].

The chronic infection accompanied by increased free radicals and pro-oxidants, that have harmful effect to biological systems such as lipids, proteins and DNA, that cause ageing, cardiovascular disturbances, diabetes, and cancer [(7)]. While the antioxidants are the compounds, act as free radicals scavenging either by prevention or conversion mechanisms [(8)]. These antioxidants produced internally in living organs or intake by foods [(9)].

α,α-diphenyl-β-picrylhydrazyl (DPPH) is described as a stable free radical due to delocalisation electron overall whole molecule (Figure 1). therefore keep this molecule from dimerization. The DPPH from the mainly methods to evaluation of antioxidants activity for the biological systems [(10)].

## Material and Methods

### Study design:

The study design is a comparative study for healthy, chronic cervicitis patients with positive HPV 16 genotyping, and patients without HPV.

### Sample collection:

HPV 16/18 genotyping detection by real-time PCR by taken specimens as tissues by cervical scraping and as Pap smear with mucus by the physician in the hospital Imam Sadiq and maternity hospital and children in Babil province, where keeping in (2 ml) from phosphate buffer solution (PBS), in addition to serum for the same persons. The specimens collected depend on the criteria of chronic cervicitis such as age, number of pregnancy or abortion, infection delay, smoking, vaginal bleeding, lower abdominal pain and vaginal pH.

**Sample size calculation:**

The sample size calculated by applying the following equation [11]:

$$n = Z^2 P (1 - P)/d^2$$

Where Z refer to Z-score (equal 1.65), d is the absolute marginal error equal 10%, P is the population (number of women that have cervicitis and undergo to cervical screen equal 8%), therefore the number of samples equal to twenty for each group, but have been taken more than 20 for the chronic cervicitis without HPV 16/18 and healthy control (Table 1). The samples were collected for a period of six months.

**Table 1: Groups classification.**

| Groups | Description | No. of the patients |
|---|---|---|
| G1 | Women with chronic HPV16/18 cervicitis | 20 |
| G2 | Women with chronic cervicitis | 40 |
| G3 | Healthy women | 40 |

**Viral DNA extraction:**

Depended on viral gene-spin DNA extraction kit, can be extracted DNA and prepared to real-time PCR.

**Real-time PCR procedure:**

Have been used Bosphore HPV genotyping kit for real-time PCR to detect HPV 16/18 genotypes [12,13].

**DPPH procedure:**

Principle:

**DPPH has violet colour due to this delocalisation when dissolved in ethanol and absorbed at 517 nm. This radical can accept a hydrogen atom from antioxidants to reduce the colour intensity from violet to yellow colour depending on the antioxidants**

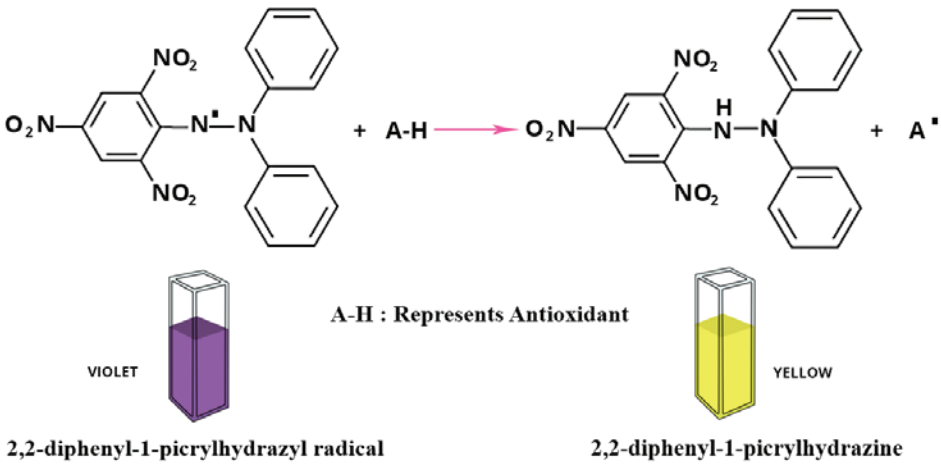


**Fig. 1: DPPH reaction with A-H.**

**Procedure:**

With minor modify prepared the reagent 1 (R1), DPPH (0.1 mM) in absolute ethanol, and control from ascorbic acid (20 mg/dl), then the following steps [14]:

| Reagent | Sample/µl | control/µl | Blank/µl |
|---|---|---|---|
| R1 | 1000 | 1000 | 1000 |
| Serum | 100 | ------- | ------- |
| Control | ------- | 100 | ------- |
| D.W. | ------- | ------- | 100 |

wait for 20 min at 25ºC. within dark condition, read absorbance at 517 nm. The results can be calculated by the following relation:

$$\textit{Free radical scavenging activity}\ \% = \frac{\textit{Absorbance of control}}{\textit{Absorbance of Sample}} \times 100$$

## Statistical Analysis

The data were entered into SPSS program version 23 to get on the variables as mean, standard deviation (SD), standard error (S.E), confidence interval and "one-way ANOVA. A p value of ≤ 0.05 was considered to be significant".

## Results and Discussion

The results for the sixty women that undergo to cervical screen represented only twenty from the patients that suffer from the symptoms that related with chronic cervicitis have HPV positive of 16 genotype only according to real-time PCR results as showing from the amplification plot (Figure 2). Where another forty also have chronic cervicitis but due to other causes than HPV 16/18 genotyping.

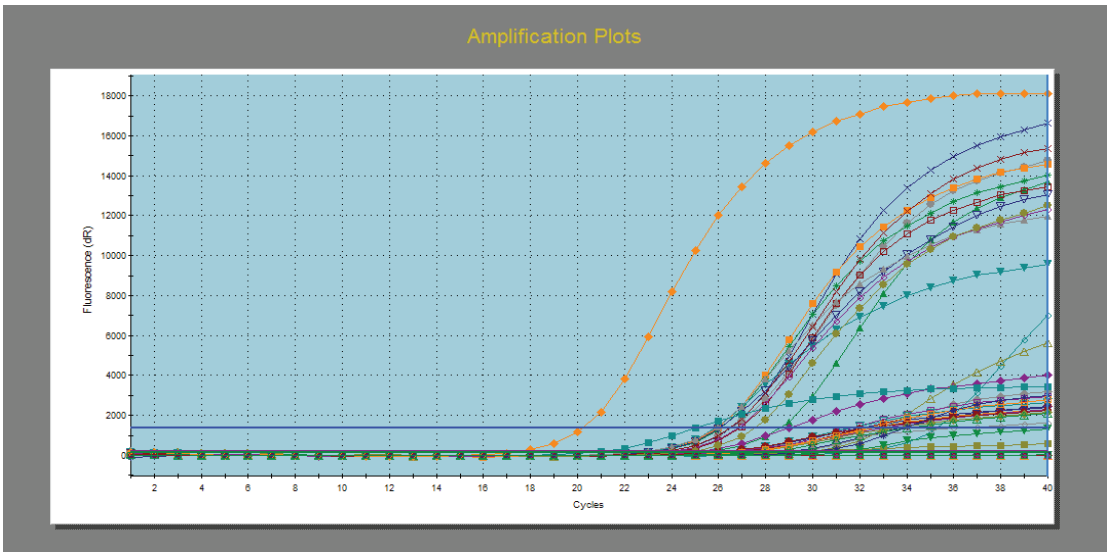


**Fig. 2: Amplification plots of real-time PCR.**

The DPPH results represented in (Table 2), were the results in G3 show the significant decrease in DPPH

scavenging compared with G1, and G2 compared with G1, also in G3 compared with G2.

**Table 2: DPPH scavenging activity.**

| Groups | | DPPH scavenging % (Mean ± SD) | S.E | Confidence Interval 95% | | P-Value |
|---|---|---|---|---|---|---|
| | | | | Lower | Upper | |
| G1 | Serum | 64.79±4.87 | 0.77 | 15.6187 | 19.5068 | .000 |
| | | | | 19.3968 | 24.1588 | .000 |
| G2 | | 47.22±4.50 | 0.71 | -19.5068 | -15.6187 | .000 |
| | | | | 1.8341 | 6.5960 | .001 |
| G3 | | 43.01±2.74 | 0.61 | -24.1588 | -19.3968 | .000 |
| | | | | -6.5960 | -1.8341 | .001 |
| G1 | Mucus | 21.24±3.62 | 0.57 | 4.5929 | 6.8647 | .000 |
| | | | | 10.1120 | 12.8945 | .000 |
| G2 | | 15.51±1.41 | 0.22 | -6.8647 | -4.5929 | .000 |
| | | | | 4.3833 | 7.1657 | .000 |
| G3 | | 9.73±1.53 | 0.34 | -12.8945 | -10.1120 | .000 |
| | | | | -7.1657 | -4.3833 | .000 |

The investigations of this results may be due to the chronic infection in cervix cause increased the number of leukocytes in the location (mucus) of inflammation and this lead to elevated levels of reactive oxygen species (ROS) such as superoxide and hydrogen peroxide to destroy the microorganisms that cause this inflammation such as HPV, bacteria or fungi. Also depletion of antioxidants in the immunity defense process.

Moreover, there are found significant lowering in G3 compared to G2, because of the viral cause desquamation for the epithelial tissues in chronic cervical infection and maybe cause epithelial cells necrosis, then increase electron leakage from the mitochondria and depleted the antioxidants. Therefore, the lowering antioxidants in the body (serum) or cells lead to reduce the ability to scavenging DPPH compared with healthy persons.

## Conclusion

In brief, DPPH scavenging activity from the primary methods to estimation the antioxidants status of the body. In the patients show the lowering in the antioxidants due to inflammation compared with healthy women. The deterioration in the antioxidants levels can cause cancer in the future or delay the response of the medication to inflammation.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest**: The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# Estimation of Some Genetic and Physiological Variables of Iraqi Desert Snake *Cerastes gasperettii*

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## Abstract

This study nominate the first blood indicate ranges for desert snake (***Cerastes gasperettii***) , Twenty-eight samples of the species under study were collected during field trips in the study area (Anbar desert located at western sector of Iraq about 400 kilometers west of Baghdad City).The examined hematologic values of the (***Cerastes gasperettii***) snake showed the highest erythrocyte ,WBC , hemoglobin ,MCH , MCHC and hematocrit value in male when a compared with females, The MCV value was found to be the highest in females and the lowest in male, karyological study revealed that the chromosome number is 2n (diploid) and the fundamental number (ZW) is 34 in male and female. DNA fragment was observed by agarose gel electrophoresis for CTNNB1 and WAC specific primers, the derived fragments ranged from approximately 600 bp, Additionally, in the CTNNB1 specific primer amplification of DNA fragments was found in male and female and ranged from approximately 900-bp DNA band.

***Keywords:*** *Cerastes Sp.*, snake, blood, chromosome, PCR

## Introduction

Western Iraq desert is home to a unique fauna and flora that has been shaped by the combination of several factors including the harsh climatic conditions of the Sahara (Arabian deserts), the episodic appearance of humid cycles, and by the complex geological evolution of the area. [(1)]. Taxonomy today often relies on molecular data for further support and information, such data are usually preferred over morphology for the reconstruction of evolutionary relationships among organisms. The increasing use and availability of molecular data has led to the development of new methods to study systematics, and has proven to be an invaluable tool for evaluating the evolutionary relationships between both closely and distantly related species [(2)]. Recent studies of Middle Eastern snakes have used molecular data to elucidate the inter- and intra-specific relationships among taxa, revealing high levels of genetic differentiation and cryptic diversity that do not accord with the current taxonomy, such studies have also provided insights into the historical biogeography of the taxa and the processes that triggered their diversification. However, the biodiversity of snakes in the Middle East remains unclear, as systematic and biogeographic data for several genera are still lacking. One such example is that of the colubrid genus *Cerastes sp*.[(3)]. ***Cerastes sp.*** is a venomous viper species occasionally found near human habitations, the information regarding their natural history is scarce are poorly known, it is very similar in appearance to *C. cerastes*, but the geographic ranges of these two species do not overlap, they are mostly daytime but can also be active during the nighttime Morphologically are characterized by Harsh, pressed body and short tail, the head triangular clear from neck, the Females are usually larger than males and average total length (body + tail) is 40–70 cm, with a maximum total length of 100 cm. that are mostly nocturnal but can also be found active during the day, prefer dry areas with little vegetation and are found in desert areas In Iraq desert, Jordan, and Egypt (i.e., the Sinai Peninsula), they are also known from arid and stony steppes, sparsely vegetated rocky slopes and wadis [(4).] The genus is currently comprised of three known species:

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***Cerastes cerastes***: it is found in arid North Africa (Morocco, Mauritania and Mali, eastward through Algeria, Tunisia, Niger, Libya and Chad to Egypt, Sudan, Ethiopia and Somalia) through Sinai to the northern Negev of Israel. In the Arabian Peninsula, it occurs in Yemen, Kuwait, extreme southwestern Saudi Arabia and parts of the country in Qatar where it is sympatric with *C. gasperettii.* A report of this species being found in Lebanon is unlikely [5]**.**

***Cerastes gasperettii***: In the Arabian Peninsula it has been found in Kuwait, Bahrain, Saudi Arabia, Oman, Qatar, United Arab Emirates, and Yemen. It is found in the Arava valley, located on the border between southern Israel and Jordan, eastwards through Jordan and Iraq to Khuzestan Province in southwestern Iran. [6].

***Cerastes vipera***: It is found in arid North Africa Mauritania, Morocco , Algeria , Mali , Tunisia , Libya , Niger, Chad and Egypt. Sinai Peninsula: Egypt and Israel. [7]. The current status of the recognized species within *Cerastes sp*., their relationships and distribution, remain relatively unclear, as no study has sampled all known species from the entire distribution range of the genus. In this work, we explore the phylogenetic relationships within *Cerastes sp*. by means of a broad sampling coupled with a morphological revision. Using an integrative taxonomic approach, we seek to produce the most complete phylogeny of *Cerastes sp.* to date, in order to clarify its systematics, describe a new species from Iraq, and elucidate its biogeographically and evolutionary history [8].

## Materials and Method

Twenty-eight samples of the species under study were collected during field trips in the study area (Anbar desert located at western sector of Iraq about 400 kilometers west of Baghdad City). Blood samples were collected from (males and females) the ventral tail vein using a 25-gauge needle attached to 1ml disposable syringe containing (EDTA)The red blood cell counts (RBC) and white blood cell counts (WBC) were carried out using a Neubauer hemocytometer, where standard Hayem's solution for red blood cells and Turk's solution for white blood cells were used as a diluting solution.Hematocrit (HCT) was deter-mined using the microhematocrit method [9,10]. The tubes were then spun in a microhemat-ocrit centrifuge for 5 min at 12,000 rpm and the hematocrit (HCT) was calculated with the total blood level divided by the blood cell level. Hemoglobin concentration (Hb) was measured by the Sahli method with a Sahli hemoglobinometer (Tanyer, 1985). The mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), and mean corpuscular hemoglobin concentration (MCHC) were calculated mathematically, taking the above results into consideration [9]. Chromosome preparations were applied for cytogenetic studies by lymphocyte culture of whole blood samples. The culture cells were treated with a colchicine-hypotonic-fixation-air-drying technique followed by conventional staining, twenty cells of each individual chromosome checks, length measurements, karyotyping were accomplished by using a light microscope [10,11]. Genomic DNA extraction was performed with DNeasy tissue Kit (QIAGEN). Extracted DNA Blood samples were stored in -30ºC to be used as a template for the polymerase chain reaction, DNA were amplified using specific primers WAC and CTNNB1[12, 13]. The descriptive statistics of the data obtained from our study were performed using SPSS (10.0 for Windows Student Version). Hematological variables were summarized as mean, standard deviation (SD), standard error of the mean (SE), and range. Results were considered significant at $P \leq 0.05$.

**Table 1. Primers used for the amplification of the CTNNB1 and WAC genes.**

| | |
|---|---|
| WAC | F:5′-CTCAGCCATCTAATCAGTCCCCAA-3 |
| | R:5′-GAACGCTGAAGACTTCGAGGAG-3′ |
| CTNNB1 | F1:5′-AGAGACGTCCACAATCGGATTG-3′ |
| | R:5′-CAGACGTTTCTTATAATCTTGTGG-3′ |

## Results

The examined hematologic values of the (***Cerastes gasperettii***) snake showed the highest erythrocyte and WBC count in male whereas the lowest erythrocyte count was found in females , The hemoglobin and hematocrit value was detected to be the highest in male too , The MCV value was found to be the highest in females and the lowest in male , and the MCH and MCHC value was found to be the highest in male and the lowest in females, The hematologic values of (***Cerastes gasperettii***) snake are given in detail in Table 2.

Table 2. Hematological data on the snakes. N: Number of specimens, SD: Standard Deviation, RBC: Red Blood Cell Count, WBC: White Blood Cell Count, Hb: Hemoglobin Value, HCT: Hematocrit, MCV: Mean Corpuscular Volume, MCH: Mean Corpuscular Hemoglobin, MCHC: Mean Corpuscular Hemoglobin Concentration.

| Sex | N | RBC (1 mm3) | WBC (1 mm3) | Hb (g/dL) | HCT (%) | MCV (%) | MCH (pg) | MCHC (%) |
|---|---|---|---|---|---|---|---|---|
| | | Mean ±SD (Min-Max) | Mean ±SD (Min-Max) | Mean ±SD (Min-Max) | Mean ±SD (Min-Max) | Mean ±SD (Min-Max) | Mean ±SD (Min-Max) | Mean ±SD (Min-Max) |
| Male | 13 | 927,543 ± 135,724 (765,478 -1,120,215) | 5530 ± 183,8 (5400-5660) | 9.41 ± 2.85 (5.7-12.6) | 31.4 ± 4.22 (26-37) | 261.18 ± 61.05 (216.62-352.23) | 136.11 ± 50.28 (75.10-227.49) | 28.98 ± 1.64 (27.77-31.47) |
| Female | 15 | 768,277 ± 226,125 (393,245 -1,062,223) | 5266 ± 141.4 (3400-4240) | 8.5 ± 0.81 (7.5-9.3) | 27.73 ± 6.86 (20-34) | 337.88 ± 60.95 (266.69-412.27) | 96.71 ± 38.57 (62.18-137.59) | 24.27± 1.39 (22.16-26.24) |

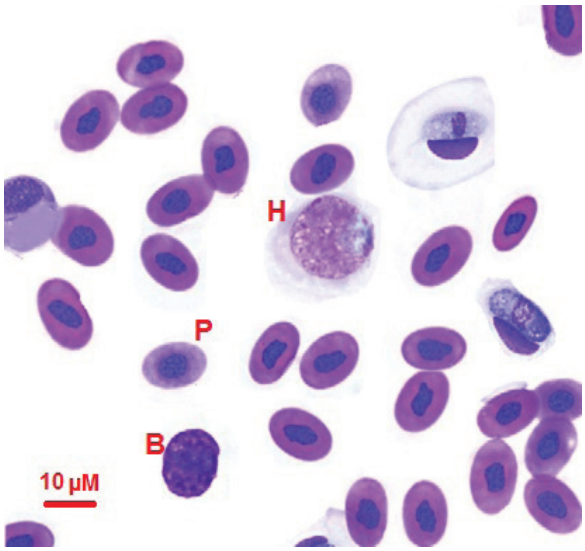
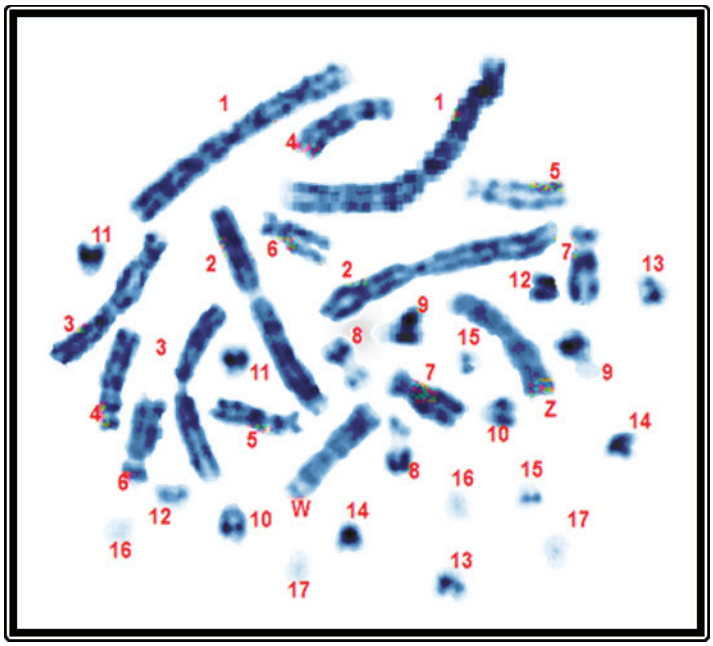



**Figure. 1. Peripheral blood from (*Cerastes gasperettii*) with erythrocytes and B, basophil; H, heterophil; P, polychromatophils Wright-Giemsa, x100 objective**

Karyological study of the (***Cerastes gasperettii***) snake using lymphocyte revealed that the chromosome number is 2n (diploid) and the fundamental number (ZW) is 34 in male and female. The diploid chromosome complements (Fig.1) consisted of pairs of metacentric or submetacentric macrochromosomes, gradually decreasing in size and pairs of microchromosomes.



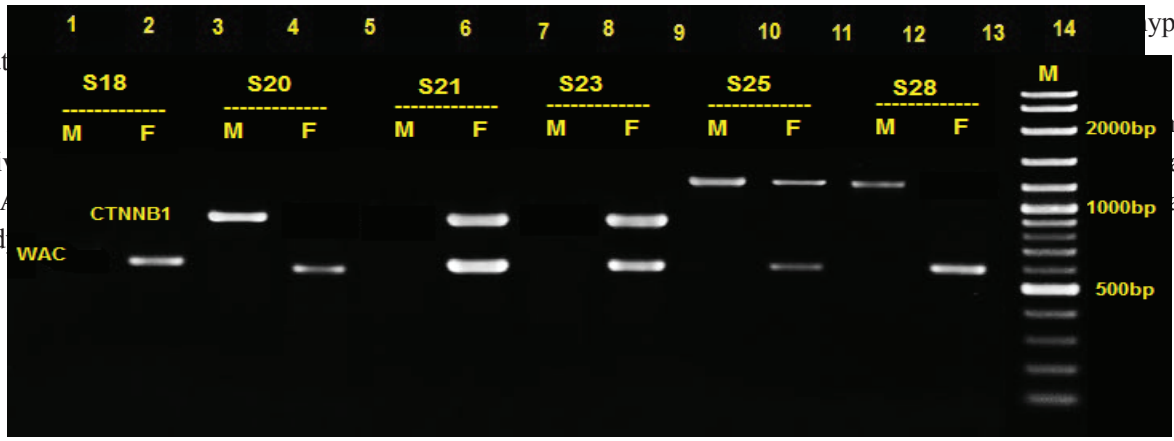



**Figure.4. Agarose gel electrophoresis of PCR products in males and females of six (*Cerastes gasperettii*) snake using CTNNB1 and WAC M, male F, female**

## Discussion

The recent study has Recorded the first set of haematological parameters for any Iraqi snake species and provides normal reference intervals may be applied when examining other snakes, particularly species in the same family as those lived in the same desert. The coccygeal vein blood sampling of snakes is the easiest and safest method for clinicians blood collection from venomous snakes[14]. We adjust our method of collection Because lymph can contaminate samples collected in the syringe via aspiration, One of the most uncertainty aspects of diagnostic hematology of snake is the adjust the cell counts, Because RBCs are nucleated manual methods must be used to quantify leukocytes[15].

This study reported significantly Other snakes may have higher PCVs as in other environments such as percutaneous oxygen uptake, increased oxygen storage capacity in the lungs and lowered metabolic rates may provide increased oxygen availability therefore reduce the need for higher PCV for oxygen carrying capacity. [16,17]. male had higher RBC counts, MCV , MCH , and MCHC values than females, Because of the inverse relationship between erythrocyte number and size, species with higher MCV, such as turtles and snakes, have lower RBC counts than lizards, which have a lower MCV and higher RBC count, The average erythrocyte lifespan ranges from 600 to 800 days in reptiles[17]. This extremely slow turnover of erythrocytes (relative to human erythrocytes, which have a 120-day lifespan)

is thought to be associated with the slow metabolic rate of reptiles[15]. The conventional G-banding techniques revealed good number of G-bands on one set of haploid, which includes autosomes, Z and W chromosomes, Our present study showed that eight chromosome pairs show the same patterns (pairs 10, 11, 12,13, 14 ,15 ,16 and 17) and ten pairs share similarities (pairs 1, 2, 3, 4, 5, 6, 7,8, 9 and ZW chromosomes).This indicates that maybe there is evolutionary relationship between the desert Snake and the other snakes[18]. For further studies, more information about genetic differences is needed which may be accomplished by using molecular biology or molecular genetics. We try to developed novel PCR-based molecular sexing methods with two primer sets to identify sex chromosome systems by molecular method utilizing sex-specific sequences, thus, more advantageous than cytogenetic analyses to identify individual (*Cerastes gasperettii*) snake sex , based on the nucleotide sequence differences of two gametologous genes CTNNB1 and WAC the males with the homogametic sex chromosome (ZZ) were characterized by a single DNA fragment band from the two Z homologs, and the females with the heterogametic sex chromosome (ZW) were identified by two bands differing in fragment sizes from the one Z and one W homologs. The two primer sets CTNNB and WAC were available for molecular sexing in (*Cerastes gasperettii*) snakes, respectively. These two markers exhibited co-dominant DNA pattern type. This suggests that the Z and W forms of the CTNNB or WAC genes were differentiated by the cessation of recombination in the (*Cerastes gasperettii*) lineages [19,20].

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding**: Self-funding

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# Evaluation of Soluble PD-1 and PD-L1 in Iraqi Type 2 Diabetes Mellitus (T2DM) Patients with Chronic Toxoplasmosis

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## Abstract

*Toxoplasma gondii* is an important opportunistic parasite in immunocompromised people. Globally, diabetes mellitus is one of the most challenging public health burdens of the 21st century. Both toxoplasmosis and diabetes are very common in Iraq and other countries. The main objective of the present study was to investigate the sero- prevalence of the anti-*Toxoplasma gondii* IgG antibodies in Iraqi T2DM patients and to clarify the role of soluble programmed death-1 (sPD-1) and ( sPD-L1) in Iraqi T2DM patients with chronic toxoplasmosis. Enzyme Linked Immunosorbent Assay (ELISA) was used to detect anti- *T. gondii* IgG antibodies in the sera of 180 patients with type 2 diabetes mellitus (T2DM) and 163 apparently healthy controls. The results showed that 117(34%) samples of sera patients have been founded T2DM with toxoplasmosis, 63(18%) samples have T2DM, 55(16%) cases have control toxoplasmosis (those patients were had toxoplasmosis but showing no symptoms) and 108 (32%) cases samples were considered as a control group without any infections. Sera (sPD-1 and sPDL-1) levels were determined by ELISA using a quantitative sandwich enzyme immunoassay technique. The results showed that levels of sPD-1 and sPDL-1 levels were significantly higher in patients group than healthy subjects (P<0.01).

***Keywords:*** *Toxoplasma gondii, chronic toxoplasmosis, T2DM, sPD-1 and sPDL-1*

## Introduction

*Toxoplasma gondii* (*T. gondii*) is an intracellular obligate parasite that belongs to phylum Apicomplexa which causes Toxoplasmosis [(1)]. Cats and other Felidae family members implicate as a definitive host of the parasite. Humans and other livestock are considered as intermediate host of *T. gondii* [(2)].

Toxoplasmosis is usually asymptomatic in infected humans. However, some infected group such as immunocompromised patients, suffer from fatal and life-threatening outcome including encephalitis, pneumonia, retino-choroiditis, epilepsy and other neurological complication [(3)].

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Toxoplasmosis is implicated in numerous autoimmune diseases for example rheumatoid arthritis, polymyositis, thyroid autoimmunity and anti-phospholipid syndrome [(4)]. However, *T. gondii* infection in individuals with type 2 diabetes mellitus (T2DM) has received little recognition.

The T2DM is the most common type which accounts for about 90% of all diagnosed diabetes cases [(5)]. The disease reduces cellular and humeral immune status through their deplorable long hyperglycemic course and possibly stimulates latent opportunistic pathogens [(6)]. The prevalence of diabetes is reaching epidemic levels and it is estimated that 642 million people will be living with diabetes by 2040, up from 415 million in 2015. Toxoplasmosis is a disease caused by the protozoan parasite *Toxoplasma gondii*. Up to one third of the world's human population is estimated to be carrying *Toxoplasma* infection and the life cycle of this parasite plays a huge role in its easy transmission [(5)].

Both toxoplasmosis and T2DM are very common in Iraq and other countries [7].

Programmed death-1 (PD-1) is a novel member of the CD28 superfamily. It's a negative co-stimulatory factor that mediates negative co-stimulatory signal [8]. PD-1 can effectively inhibit functioning and proliferation of the T cells, and reduce IL-2, IL-10 and IFN-γ secretion [9] playing an important role in immune regulation [10].

In recent years, more and more studies indicate that the pathogenesis of T2DM involves immune dysfunction, and T2DM can be considered somewhat a chronic inflammatory disease [11]. Impaired immunity in patients with diabetes may increase the risk of infection; however, the exact effect of diabetes on patients with toxoplasmosis remains to be studied. The main objective of the present study was to investigate the sero- prevalence of the anti-*Toxoplasma gondii* IgG antibodies in Iraqi T2DM patients and to clarify the role of soluble programmed death-1 (sPD-1) and ( sPD-L1) in Iraqi T2DM patients with chronic toxoplasmosis.

## Materials and Method

### Subjects and Samples

This study was included 180 samples of patients with Type 2 diabetes mellitus (T2DM ) attending to Department of diabetes in Al-Iamamain Al-Kadhumain Teaching Hospital in Baghdad ,Iraq. During the period from December 2018 to April 2019. Out of this sample, a group of 163 healthy subjects were considered as control group. The age of all patients and healthy subjects were ranged from 39 – 79. Five ml of venous blood were collected from each subjects (patients and control) and placed in gel tube, the serum was separated and divided in ependorff tubes then stored at -20C° until it is used.

### Serological tests

**1- ELISA *T. gondi* – IgG :** The sera of all samples (Patients and control) were tested with the presence of specific IgG antibodies of *Toxoplasma gondii*, via ELISA kits which had supported by (Bioactiva Company, Germany) and applied the test according to the manufacturer's instructions.

**2-Serum Level of PD-1:** Serum levels of **PD-1** was measured by using specific enzyme-linked immunosorbent assay) ELISA) kit (R&D Company, USA), according to the manufactures protocol.

**3-Serum Level of PD-L1:** Serum levels of **PD-L1** was measured by using specific enzyme-linked immunosorbent assay) ELISA) kit (Sunlong Biotech Company, China), according to the manufactures protocol.

### Statistical Analysis

The Statistical analyses were done by Statistical Package for the Social Sciences for Science (SPSS) version 2010. The statistical tests was included Descriptive statistical tables, Mean, Standard Error, Standard Deviation, 95% Confidence Interval of the Mean under $P > 0.05$ and $P < 0.01$ to considered statistically significant.

## Results

In the summarize examine results, the study samples showed that 117(34%) samples of sera patients have been founded T2DM with toxoplasmosis , 63(18%) samples have T2DM, 55(16%) cases have control toxoplasmosis (those patients were had toxoplasmosis but showing no symptoms) and 108 (32%) cases samples were considered as a control group without any infections (Table1).

The cut– off value of positive IgG (10 IU/ml) in all studied groups. The results recorded in the table 1 were shown higher results of levels of IgG in T2DM with toxoplasmosis group as 22.65± 8.55 IU/ml, followed by positive control group 19.59±7.52 IU/ml, and T2DM group with value 5.98±2.09 IU/ml, while negative control group presented low results of this antibody 3.48±2.40 IU/ml.

**Table 1: Levels of IgG antibodies (IU/ml) for all study groups.**

| Groups | No. of Samples | % | Mean ± SD. | 95% Confidence Interval for Mean | |
|---|---|---|---|---|---|
| | | | | Lower Bound | Upper Bound |
| Type 2 diabetes mellitus (T2DM) with Toxoplasmosis | 117/180 | 65 | 22.9 ± 6.42 | 21.71 | 24.06 |
| T2DM | 63/180 | 35 | 1.51 ± 5.5 | 5.17 | 5.93 |
| Positive control | 55/163 | 16 | 8.73 14.3 ± | 11.90 | 16.62 |
| Negative control | 108/163 | 32 | 3.0 ±1.98 | 2.64 | 3.39 |

Table (2) shows the comparisons in the means of the IgG among all studied groups, highly significant differences ($P < 0.01$) were registered when comparing the values of IgG for the patient's in T2DM with toxoplasmosis and T2DM only, positive control and negative control .

**Table 2: Multiple comparisons of the IgG concentrations ( IU/ml) according to**

| Parameter | Group(1) | Group(j) | P-value | Sig. |
|---|---|---|---|---|
| IgG | Type 2 diabetes mellitus (T2DM) with Toxoplasmosis | T2DM | 0.000 | HS |
| | | Positive control | 0.000 | HS |
| | | Negative control | 0.000 | HS |
| | T2DM | Positive control | 0.000 | HS |
| | | Negative control | 0.000 | HS |
| | Positive control | Negative control | 0.000 | HS |

HS: Highly Significant at P< 0.01

Games-Howell (G.H.) test for potential couples between studied groups

Table (3) referred to the differences of the means for sPD-1 among all studied groups, the results didn't record significant difference when comparing the level of sPD-1 in T2DM patients with toxoplasmosis and the groups of T2DM, positive control respectively, while high significant differences at probability of $P<0.01$ were recorded when comparing the negative group.

**Table 3: Multiple comparisons of the sPD-1 concentrations (pg/ml) according to**

| Parameter | Group(1) | Group(j) | P-value | Sig. |
|---|---|---|---|---|
| sPD-1 | Type 2 diabetes mellitus (T2DM) with Toxoplasmosis | T2DM | 0.817 | NS |
| | | Positive control | 0.088 | NS |
| | | Negative control | 0.000 | HS |
| | T2DM | Positive control | 0.241 | NS |
| | | Negative control | 0.000 | HS |
| | Positive control | Negative control | 0.068 | NS |

HS: Highly Significant at P< 0.01; NS: No Significant at P> 0.05

Games-Howell (G.H.) test for potential couples between studied groups

**Table (4) showed high level of sPDL-1 in the group of T2DM with toxoplasmosis patients 127.5 ±29.31 pg/ml compared to T2DM 114.2 ±17.89 pg/ml, positive and negative control 123.4 ±34.53 pg/ml 116.3±24.44 pg/ml respectively.**

**Table 4 : Levels of sPDL-1 (pg/ml) for all study groups.**

| **Groups** | **No. of Samples** | **Mean± SD** | **95% Confidence Interval for Mean** | |
|---|---|---|---|---|
| | | | **Lower Bound** | **Upper Bound** |
| Type 2 diabetes mellitus (T2DM) with Toxoplasmosis | 60 | 127.5 ±29.31 | 119.9 | 135.0 |
| T2DM | 31 | 114.2 ±17.89 | 111.3 | 117.1 |
| Positive control | 16 | 123.4 ±34.53 | 105.0 | 141.8 |
| Negative control | 69 | 116.3 ±24.44 | 110.4 | 122.1 |

**Table 5: Multiple comparisons of the sPDL-1 concentrations (pg/ml) according to**

| Parameter | Group(1) | Group(j) | P-value | Sig. |
|---|---|---|---|---|
| sPDL-1 | Type 2 diabetes mellitus (T2DM) with Toxoplasmosis | T2DM | 0.008 | HS |
| | | Positive control | 0.972 | NS |
| | | Negative control | 0.096 | NS |
| | T2DM | Positive control | 0.722 | NS |
| | | Negative control | 0.920 | NS |
| | Positive control | Negative control | 0.862 | NS |

HS: Highly Significant at P< 0.01; NS: No Significant at P> 0.05

Games-Howell (G.H.) test for potential couples between studied groups

## Discussion

The main goal of the current study was to investigate the sero prevalence of the anti-*Toxoplasma gondii* IgG antibodies in Iraqi T2DM patients and to clarify the role of soluble programmed death-1 (sPD-1) and (sPD-L1) in Iraqi T2DM patients with chronic toxoplasmosis. The results of the present study revealed that 65% of the diabetic subjects were found seropositive for the anti-*T. gondii* IgG antibodies while 35% of the non-diabetic individuals were found seropositive with the same antibody.

Consequently, the risk factor for *T. gondii* infection in diabetic patients was about two folds higher than in healthy controls. Therefore, patients infected with *T. gondii* may be more at risk to develop diabetic than uninfected individuals.[10]. Recently, Sharad and Al-Hamairy[12] conducted a sero epidemiological study in order to detect the sero prevalence of *T. gondii* in diabetic individual in Babylon Province, Iraq and their results showed that the sero positivity rates were 51.4% for the *T. gondii* IgG by ELISA test. Siyadatpanah et al. [13] investigated the anti-*T. gondii* IgG antibodies in diabetic and non-diabetic individuals in west Mazandaran province, Iran, using ELISA method and their results showed that 52.6% of the diabetic individuals were seropositive for anti- *T. gondii* IgG while 50.6% of the non-diabetic individuals were seropositive for the same antibody. Recently, Modrek et al. [14] conducted a study to estimate the serum levels of *T. gondii* IgG antibodies in 205 diabetic patients in Iran and their results showed that the overall sero positivity rate was 70.7%. Molan and Ismael [7] detected a study to determine the serum levels of *T. gondii* IgG antibodies in 300 T2DM patients in Diyala Province, Iraq and their results showed that the overall sero positivity rate was 66%.

Although toxoplasmosis and diabetes may pave the way to each other, the occurrence of necrotic lesions in the pancreas of the experimental animals infected with *T. gondii* may indicate that toxoplasmosis paves the way to diabetes as the involvement of the pancreas can lead to the inhibition of insulin secretion and consequently the establishment of diabetes. Previous studies have confirmed the occurrence of necrotic lesions and inflammation in various organs (pancreas, stomach, lymph nodes and intestine) of the experimental animals infected with *T. gondii* and the tachyzoites have been detected in these lesions [13,14].

Oz [15] reported that *T. gondii* infects nucleated cells including pancreatic and may destroy the β cells and secretion of insulin and increase the risk of acute and chronic pancreatitis as well as diabetes. In addition, the tissue necrosis in pancreas during acute toxoplasmosis has also been reported [14]. The bradyzoites of *T. gondii* have been detected inside tissue cysts in the pancreatic tissues, acinar cells and bile duct epithelial cells [16].

Moreover, Prandota et al. [17] reported that *T. gondii* plays an important role in the pathogenesis of both types of diabetes. Consequently, during the process of organ transplantation, the recipients of pancreas and kidney containing the tissue cysts that contain the bradyzoites, are at a great risk for toxoplasmosis due to immunosuppressive chemotherapy and/or reactivation of bradyzoites [18].In contrast, T2DM has been considered as chronic inflammatory disease that induces various changes to immune cell function[19].

Programmed death-1 (PD-1) is a novel member of the CD28 superfamily. It's a negative co-stimulatory factor that mediates negative co-stimulatory signal [8]. PD-1 can effectively inhibit functioning and proliferation of the T cells, and reduce IL-2, IL-10 and IFN-γ secretion [9] playing an important role in immune regulation [10].

In this regard, there are no available literatures about the role of sPD-1 and sPDl-1 in toxoplasmosis. However, some studies have evaluated the serum level of sPD-1 during other infectious disease. These studies observed significantly higher levels of sPD-1 among patients with chronic HCV [20], *Echinococcus granulosus* [21], pulmonary tuberculosis and those whom having active pulmonary TB with co-incidental *Strongyloides stercoralis* [22] infection than control subjects free from these diseases.

Thus, increase in sPD-1 level inhibits the PD-1/ PD-L1 signaling pathway in T cells through negative feedback. Consequently, it reduces the inhibition of T cell activation and increases the activity of the immune system for managing CL. This supports the findings of Wang *et al*. [23] who suggested that sPD-1 blocks the membrane PD-1 binding site on activated T-cells, thereby attenuating the PD-1 signaling pathway and increasing the immune response.

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest**: Non

**Funding**: Self-funding

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# Clinical Variants of Rosacea in Iraqi Patients

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## Abstract

**Introduction:** rosacea can diagnosis by presence permanent erythema of the arched sides of the face, cheeks and nose then it affect the chin as well as brow. **Method:** A cross sectional study design was implemented, 50 child of Rosacea, were collected from outpatients of dermatology and venereology in Merjan teaching hospital and Alhussein teaching hospital in Thi Qar, from Jan. 2018 to Jan. 2019. All patients were identified basing on the distinctive clinical features by dermatologist, and for suspicious cases biopsy was taken to confirm the diagnosis. **Results:** no significant association between age groups and gender of kids. Significant association between gender and types, 61.1% of females and 54% of males with with Erythemato telengectetic while 30% of females and 14% of males with mixed type. No significant association between gender and types of skin P-value more than 0.05. No significant association between gender and drugs used. P-value more than 0.05. **Conclusion:** There is significant association between female gender and Erythematotelengectetic and mix type of rosacea, while significant association between male gender and Papulopastular type of rosacea.

***Key words:*** *Clinical variants, rosacea, Iraqi patients*

## Introduction

Rosacea can diagnosis by presence permanent erythema of the arched sides of the face, cheeks and nose then it affect the chin as well as brow. In addition, it separate from skin of periocular. It affected females with age 30 – 50 years old. In addition, more serous type of phymatous variations occur in males. Usual features include papules, pustules, flesh skin and telangiectasia. These tend to cluster in patterns, allowing for the identification of several subsets of patients; their recognition is important because the therapeutic implications differ [(1)]. The term □*rosacea*□ encompasses a constellation of clinical findings, with the key components being persistent facial erythema and inflammatory papulopustules. In 2002, rosacea was classified into four clinical subtypes1: (1) erythematotelangiectatic; (2) papulopustular; (3) phymatous; and (4) ocular . From a clinical perspective it is useful to classify rosacea into the following four subtypes [(1)]. However, this classification is intended as a guide given that there is some overlap amongst the subtypes and a patient can have more than one subtype. *Erythematotelangiectatic rosacea* (subtype 1; ETTR): Individuals have Persistent centrofacial erythema, Flushing, Telangiectasias, Skin sensitivity• *Papulopustular rosacea* (subtype 2; PPR): Patients have Persistent centrofacial erythema, Papules, Pustules/papulopustules, Overlap with other subtypesmay occur. Phymatous: In this form of rosacea patients have Thickened, nodular skin, Prominent pores, Can affect nose, (rhinophyma), chin (gnathophyma), forehead (metophyma), ears (otophyma), eyelids (blepharophyma), May be associated with other features of rosacea or occur in isolation. Ocular: This entity may or may not be accompanied by cutaneous changes of rosacea. Patients have Dry, gritty sensation, Blepharitis, Conjunctivitis, Chalazia and hordeola, Keratitis, episcleritis, scleritis, iritis (rare) [(2)].

## Methods

A cross sectional study design was implemented, 50 child of Rosacea, were collected from outpatients of dermatology and venereology in Merjan teaching hospital and Alhussein teaching hospital in Thi Qar, from Jan. 2018 to Jan. 2019. All patients were identified basing on the distinctive clinical features by dermatologist, and for suspicious cases biopsy was taken to confirm the diagnosis.

The demographic statistics such as age, gender and the duration of the disease was taken using a checklist, while information about the lesions such as type of lesion, site of involvement and numbers of lesions, itching and other associated symptoms were evaluated at the base time after taking the patients' verbal agreement. The statistical investigations using SPSS version were done. The results attained are deliberated significant at $p < 0.5$. Data used to evaluate the correlation between age, clinical type of LP and the gender of the patients.

## Results

50 child with UTI include in study, according to table 1 there is no significant association between age groups and gender of kids.

***Table 1: association between age groups and gender.***

| **Age group (Years)** | **Male** | | **Female** | | **P.Value** |
|---|---|---|---|---|---|
| | **n** | **%** | **N** | **%** | |
| **10 - 19** | **7** | **14%** | **6** | **6.66%** | |
| 20 - 29 | 20 | 40% | 48 | 53.33% | |
| 30 - 39 | 7 | 14% | 9 | 10% | |
| 40 - 49 | 2 | 4% | 4 | 4.44% | **0.466** |
| More than 50 | 14 | 28% | 23 | 25.55% | |
| Total | 50 | 100% | 90 | 100% | |
| M±SD | 34.10±15.95 | | 32.98±14.89 | | |

**P-Value ≤ 0.05 Significance**

From table 2 there is significant association between gender and types, 61.1% of females and 54% of males with with Erythematotelen gectetic while 30% of females and 14% of males with mixed type.

**Table 2: association between gender and types.**

| **type** | **Male** | | **Female** | | **P.Value** |
|---|---|---|---|---|---|
| | **N** | **%** | **N** | **%** | |
| Papulopastular | 10 | 20% | 6 | 6.66% | |
| Erythematotelengectetic | 27 | 54% | 55 | 61.11% | |
| phymatous | 6 | 12% | 2 | 2.22% | 0.003* |
| Ocular | 0 | 0% | 0 | 0% | |
| Mixed | 7 | 14% | 27 | 30% | |
| Total | 50 | 100% | 90 | 100% | |

**P.Value ≤ 0.05 Significance**

**Mixed** = ET+ocular **,** ET+PP

According to table 3 there is no significant association between gender and types of skin P-value more than 0.05.

**Table 3: association between gender and types of skin.**

| Skin type | Male | | Female | | P.Value |
|---|---|---|---|---|---|
| | n | % | N | % | |
| Skin type 2 | 0 | 0% | 0 | 0% | 0.595 |
| Skin type 3 | 29 | 58% | 48 | 53.33% | |
| Skin type 4 | 21 | 42% | 42 | 46.66% | |
| Total | 50 | 100% | 90 | 100% | |

**P.Value ≤ 0.05 Significance**

According to table 4 there is no significant association between gender and drugs used. P-value more than 0.05.

**Table 4: association between gender and drugs used**

| drug | Male | | Female | | P.Value |
|---|---|---|---|---|---|
| | n | % | N | % | |
| Non | 18 | 36% | 26 | 28.88% | 0.523 |
| Topical steroid | 22 | 44% | 39 | 43.33% | |
| Herbal | 10 | 20% | 25 | 27.77% | |
| Total | 50 | 100% | 90 | 100% | |

P.Value ≤ 0.05 Significance

## Discussion

Rosacea less affected color peoples than white peoples, trouble of discriminating erythema plus telangiectasia in color skin peoples lead to misdiagnosed and low reported of rosacea. Colored skin peoples less likely to have rosacea after sun exposure, prevalence of rosacea was high 40 million peoples affected with it and rate reach to more than 10% [3, 4]. Rosacea as a illness of people fair-skinned with Celtic plus North European legacy (Fitzpatrick skin I plus II), so high no. of rosacea occur in countries with significant amounts of peoples with skin of colored with rate more than 10%. While countries with proportion of white color skin peoples to darks skin if little so the no. of people with rosacea decrease. Peoples with dark skin may lead to miss diagnosis with rosacea and lead to delay in treatment and increase morbidity and mortality and developed phymatous rosacea [5]. The prevalence of rosacea in patients with skin of color is not well studied but appears to be less common than in those with skin phototypes I and II9. Epidemiologic studies from countries where darkly pigmented individuals predominate population-

wise suggest that the prevalence is far lower than in countries where the population is predominantly fair-skinned . Based upon a higher prevalence in those with skin phototypes I and II, *ultraviolet light* has been proposed as an additional contributing factor to the pathogenesis of rosacea. UVR also induces production of reactive oxygen species, which upregulate matrix metalloproteinases that lead to vascular and dermal matrix damage [2].

Rosacea affects all races, but is most common in fair-skinned individuals. Although the prevalence of rosacea is unknown, the vast majority of cases occur in fair-skinned populations and it is common. However, persons of African and Asian descent may also develop rosacea [6]. Rosacea occur facially and on eyes, the prevalence estimated 2.3% in Germany, 0.09% in Island, 10% in Sweden and 22% in Estonia. The ages of peoples that affected was 30 – 50 years old. Occasional cases of PPR and some cases of OR have been reported in children. The disorder appears to be less prevalent in the elderly. The age of onset of rosacea may be earlier in females than males [7]. Sex Some population studies report a slight predominance of males affected by rosacea [8], while others (mainly hospital-based studies) suggest females are more frequently affected [9]. The different figures may reflect the varying age of onset of the condition and the age profile of the particular population studied, or possibly the increased likelihood of female patients presenting to their dermatologist for treatment. Male patients are said to develop more severe rosacea than women and are much more likely to develop rhinophyma than females. Ethnicity Rosacea is a disorder that predominantly affects fair, pale-skinned, sun-sensitive individuals: those of Celtic origin seem to be most susceptible (sometimes referred to as the 'curse of the Celts' for this reason). This is reflected in the much higher frequency with which rosacea is diagnosed in dermatology clinics in northern Europe as opposed to those in southern African countries with darker skin-type populations [10]. Rosacea also appears to be less common in individuals with an Asian skin type than with white skin [11]. 348 of peoples works in Estonia 20% of them with rosacea and 55% of them with Fitzpatrick I and II type of skin, other study showed 38% of patients with type III skin and 7% type IV [12]. Also when rosacea diagnosis in color skin more in females than males with previously steroid used. Low flushing see in skin type VI occur due to circulatory supply to skin and microvascular functions. The circulation inside skin activate hyperemia then after obstruction and heating examine, so also these studies revealed difference between skin of white peoples and dark peoples and decrease in vascularity of skin of this peoples [5]. Salem et al. also revealed high frequency of rosacea in colored peoples in KSA [13], also the age of patients with rosacea was south Africa 47 years old [14], 49 years old in Tunisia [14] and 24 – 84 years old in China [16]. In China 68 women with mean of age 32.5 years old, 70.5% of patients have ETR, 29.4% of patients have PPR [17], in Japan 13 men with mean age 46.9 years old, Erythema besides papules in 69.2% of them [18], while in Korea 18 cases; with median of age 49 years old; women represented 72.2%, type IV of skin 61%; while ETR in 88.9% of cases and PPR in 11.1% of cases [19].

Another study in Korea revealed that 168 patients with mean age 47.8 years old, 70% of them were females, 57% type III of skin, 33% type IV, 7 % type V. 96 % ETR while PPR 50 %, 14 % ocular and finally 5% PHY [20].

90 patients in Italy with mean age 51 years old, 57% of them females, 27 with papulopustular lesions, 6 only with rhinophyma, 7 patients with ocular difficulties [21]. While 135 patients in Germany with mean age was 52 years old, 87% women, skin type classified as the following: 31% type III, 8% type IV, 64% ETR and PPR is most usual in in IV type of skin [22]. 50 patients in Saudi Arabia with mean age was 42 years old, skin type classified as the following: 40% type IV, 18% type V, 42% type VI, PPR represented 100% of cases [23]. In Egypt 15 women with mean age 44 years old and skin, type III 100% of cases [13].

## Conclusions

There is significant association between female gender and Erythematotelengectetic and mix type of rosacea, while significant association between male gender and Papulopastular type of rosacea.

### Ethical Clearance

The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding**: Self-funding

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# Assessment of MR-ProADM and N-Terminal B-Type Natriuretic Peptide of Serum Levels in Patients with Heart Failure.

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## Abstract

**Background**: Heart failure timely and effective diagnosis and treatment directly affects the prognosis of patients, so early diagnosis of heart failure treatment is very important. The current diagnosis of heart failure has yet to be further improved. To investigate the relationship between plasma levels of MR-ProADM and NT-proBNP in cardiac structure and function in patients with heart failure (HF) and the early detection of failure. **Methods**: Patients were recruited from the coronary care unit (CCU) of Al-Yarmouk Teaching Hospital and were admitted and verified as cases of HF by specialist cardiologists. Between the 1st of November 2017 and the 1st of April 2018; 48 patients (29 males and 19 females), were diagnosed to have HF and were included in the study. The total number of HF patients admitted to the CCU of the hospital during the study period was 100 patients but 52 patients were ruled out according to the exclusion criteria of the study such as Acute Myocardial Infarction, active myocarditis, Drug abuse or an alcohol drinker, renal failure .Apparently healthy subjects were recruited from the staff of Al-Mustanseryeah Medicine College. They comprised (40) subjects (30 males and 10 females). Each subject who was recruited in the control group has underwent a full history and physical examination with a recording of : age, gender, smoking, chronic diseases and medications.

Any subject in control group in this study must be fasting for 8-14 hours at the time of drawing of blood specimen. Consent was taken from all subjects in the control group after being told about the aim of the study. The plasma MR-ProADM and NT-proBNP levels were compared between the two groups to observe the value of plasma MR-ProADM combined with NT-proBNP in the diagnosis of heart failure. **Results:** the levels of plasma MR-ProADM and NT-proBNP were significantly higher in patients with heart failure Compared with the healthy control group. The levels of plasma MR-ProADM and NT-proBNP increased significantly ($P < 0.01$). The area under the ROC curve for the combined detection of plasma MR-ProADM and NT-proBNP was greater than the area under the three alone tests. **Conclusion**: The combined detection of MR-ProADM and NT-proBNP has high sensitivity and specificity in the diagnosis of heart failure and can be used as a new detection mode.

***Keywords*** *: MR-ProADM = mid-regional prohormone adrenomedullin, N-Terminal B-Type Natriuretic Peptide, Heart Failure .*

## Introduction

Heart failure is a clinical syndrome that results when the heart is unable to provide sufficient blood flow to meet metabolic requirements or accommodate systemic venous return its timely and effective diagnosis and treatment directly affects the prognosis of patients [(1)], so early diagnosis of heart failure treatment is very important. This study was to investigate the relationship between plasma levels of MR-ProADM and NT-proBNP in cardiac structure and function in patients with heart failure (HF) early detection of failure . The clinical data

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of 48 patients with heart failure and normal healthy people 40 subjects. The purpose of this study was to analyze the clinical significance of combined detection of plasma MR-ProADM and N-terminal B-type natriuretic peptide in the diagnosis of heart failure value. The study found that inflammation can aggravate myocardial injury, thereby worsening cardiac function, plays a very important role in ventricular remodeling [(2)]. Most of the inflammatory cytokines have a negative inotropic effect, thereby reducing myocardial contractility and cardiac output, worsening cardiac function [)3( )4(].

MR-ProADM is secreted in various tissues, including the heart, lungs, central nervous system, kidneys and gastrointestinal organs; it is also expressed in endothelial cells, vascular smooth muscle cells, fibroblasts and adipocytes. MR-ProADM has a hypotensive effect: it stimulates diuresis and natriuresis and also causes vasodilation, lowering blood pressure. In HF, as a consequence of pressure/volume overload and ventricular wall stretching, the MR-ProADM gene is upregulated in cardiac myocytes. The resulting high MR-ProADM levels appear to have a protective effect in the myocardium, as they lead to a decrease in preload and afterload. Some studies suggest that MR-ProADM additionally inhibits cell growth and hypertrophy; it has also been associated with reductions in remodeling and fibrosis[)5(].

One of the first responses to cardiac dysfunction is the activation of the sympathetic nervous system. Mid-regional proadrenomedullin (MR-proADM) is a precursor to a potent vasodilator with inotropic properties, adrenomedullin, originally isolated from pheochromocytoma cells. MR-proADM is elevated in patients with acute and chronic HF and is a strong predictor of clinical outcomes such as mortality and HF hospitalization, even when added to BNP or NT-proBNP.

## Materials and Method

### Research Objects and Groups

The study was carried out at the department of Chemistry and Biochemistry -College of Medicine- Al Mustansiry University. Patients were recruited from the coronary care unit (CCU) of Al-Yarmouk Teaching Hospital and were admitted and verified as cases of HF by specialist cardiologists. Between the 1st of November 2017 and the 1st of April 2018; (29 males and 19 females), aged ≥ 30 years, and we selected 48 patients were diagnosed to have HF. Diagnostic criteria for HF had based on the manifestation of three or four findings including: **EF in Echocardiogram** ,**Clinical presentation, ECG changes**, **and troponin positivity. The diagnosis is sometimes aided by the results of cardiac enzymes levels.** Blood was collected on admission to the CCU for the qualitative troponin-I testing. It is a device rapid test using cassette method as well as measuring complementary cardiac enzymes (GPT). Also the qualitative troponin-I testing by cassette method was repeated for double checking in the blood sample taken on the next morning for analysis of baseline laboratory tests and the study parameters. ECG changes were detected by electrocardiography done by expert nursing staff using under supervisor and specialist cardiologist electrocardiogram–recording apparatus (BIOMED Company, USA).

Any subject enrolled in control group must be fasting for more than 8 hours at the time of drawing of blood specimen.

Patients were interviewed using a questionnaire that included:

- Time of admission to CCU after chest pain.
- Past medical history , history of DM, current alcohol consumption.

Patients with Heart failure but have the following conditions were excluded in this study :

1. Acute Myocardial Infarction
2. Active myocarditis.
3. Strok , skeletal muscle injury, or trauma.
4. Age is <30 years.
5. Had abdominal enlargement for any reason other than central obesity.
6. Valvular heart disease

Apparently healthy subjects were recruited from the staff of Al-Mustansiryah Medicine College. They comprised (40) subjects (30 males and 10 females).

Each subject who was recruited in the control group has underwent a full history and physical examination with a recording of : age, gender, smoking state , chronic diseases and medications. They have no symptoms or history of coronary heart disease. They were age and sex-matched to study patients (41.55±7) and also comply to the criteria of exclusion in patients group. In addition, they underwent electrocardiographic screening to check for any ECG changes which might exist in spite of no clinical features of HF so as to be excluded from the study.

## Method

Blood collection was performed at 8.00 – 9.00 a.m. in the fasting state,

Collected blood was transferred into the tube while ensuring flowing down the wall of the tube, then serum was obtained and divided into aliquots in eppendorf tubes and stored at -20˚C until analysis.

Determination of serum NT-proBNP level by AFIAS ,is a fluorescence Immunoassay (FIA) for the quantitative determination of NT-proBNP in human serum, Boditech .While Determination of human MR-proADM concentration by enzyme linked immune sorbent assay kit (MyBioSource /USA) Application of it is measured according to kit instructions for testing .

## Statistical Methods

SPSS 22.0 software was used for statistical analysis. The t test was used to measure the data between the two groups. Chi-square test was used to count data. Logistic regression was used to analyze the risk factors for screening heart failure. The test level was 0.05. When $P < 0.05$, has statistical significane. The working curve (ROC curve) of subjects tested separately and jointly with MR-proADM and NT-proBNP was established to calculate their specificity and sensitivity.

## Results

**comparison between Heart Failure Group and Control Group in Plasma Levels of MR-proADM and NT-proBNP.**

Heart failure group increased significantly compared with the control group, the difference was statistically significant ($P < 0.01$, Table 1). Plasma levels of MR-proADM and NT-proBNP in HF group were significantly higher than those in control group ($P < 0.01$, Table 1) .

**Table 1: Heart failure group and control group heart function and plasma levels of MR-proADM and NT-proBNP.**

| | **Heart failure N= 48** | **Healthy controls N= 40** | P value |
|---|---|---|---|
| MR-Pro ADM (pg/ml) mid-regional prohormone adrenomedullin | 23.88±21.67 (0.591-80.0) | 4.20±3.94 (0.891-25.21) | 0.0001* |
| NT-proBNP (ng/ml) N-terminal pro b-type Natriuretic Peptide | 763.1855±298.94661 (22.1-2131.22) | 134.54±48.59 (59.30-232.10) | 0.0001* |
| - Data were presented as Mean±SD (Range) | | | |
| *Significant difference between two independent means using Students-t-test at 0.05 level. | | | |

**Table 2. The Best Discriminative Area Under the Curve MR-Pro ADM and NT-proBNP Parameters that Best in HF.**

| Test Result Variable(s) | Cut-off value | Sensitivity | specificity | Area | P value |
|---|---|---|---|---|---|
| MR-Pro ADM (pg/ml) | 7.22050 | 75.0 | 97.5 | 0.869 | 0.0001* |
| NT-proBNP (ng/ml) | 195.40000 | 83.3 | 85 | 0.847 | 0.0001* |

**Table 3: correlation of plasma levels of MR-Pro ADM and NT-proBNP in HF group .**

| Correlations | | | |
|---|---|---|---|
| | | MR-Pro ADM | NT-proBNP |
| | N | 48 | 48 |
| NT-proBNP | r | 0.028 | 1 |
| | p | 0.852 | |
| | N | 48 | 48 |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | |
| *. Correlation is significant at the 0.05 level (2-tailed). | | | |

## Discussion

In clinical work, the diagnosis and differential diagnosis of heart failure is still a major problem, easily lead to missed diagnosis. Rapid progress of heart failure, once the condition deteriorated, often endanger the lives of patients. heart failure with poor prognosis )3(.

In recent years, NT-ProBNP has become hot spots in the early diagnosis of heart failure )6-10(. This study aimed to explore the value of MR-Pro ADM and N-terminal B-type natriuretic peptide in the diagnosis of heart failure.

This study aimed to explore the value of MR-Pro ADM and N-terminal B-type natriuretic peptide in the diagnosis of the heart failure. A large number of studies have shown that BNP can better reflect the function of the heart [1], making it widely used in the diagnosis of heart failure. BNP is a chemical that is pulled in the ventricular wall and released into the blood by cardiomyocytes [9] [10]. BNP is also present in normal tissues and is present in very low plasma concentrations. Cardiomyocytes release BNP while also releasing equimolar NT-ProBNP into the bloodstream. Compared with BNP, NT-ProBNP has higher stability in blood plasma, longer half-life and is less affected by other substances. As the heart expands, the hemodynamics and neuroendocrine activities in the heart cavity change. The higher the pressure in the ventricle, the stronger the ventricular wall is pulled and the higher the level of NT-ProBNP secreted by cardiomyocytes [11]. In the present study, the level of NT-proBNP was significantly higher than that of the control group, confirming that NT-proBNP has a very important clinical value in the diagnosis of heart failure. Nomura et al. [12] showed that serum NT-proBNP were elevated in heart failure and that agree with this study.

## Conclusion

In this study, our results showed that plasma levels of MR-Pro ADM and NT-proBNP in patients with heart failure were significantly higher than those in healthy controls, both of which could be used as indicators of heart failure. There was no significant difference in the levels of MR-Pro ADM and NT-proBNP between the

heart failure group.

ROC curve results show that the detection of MR-Pro ADM and NT-proBNP alone in the diagnosis of acute heart failure has a good sensitivity and specificity.

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding**: Self-funding

## Reference


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# Effects of Two Different Doses of Vitamin B2 and a Single Dose of Vitamin B12 Against Cyclophosphamide Induced Nephrotoxicity

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## Abstract

Cyclophosphamide, a medication that is used for the treatment of different types of cancer; however its' use associated with numerous adverse effects. Vitamin B2 and vitamin B12 suggested having nephroprotective effect. This work is designed to investigate the nephroprotective effect of both vitamins against cyclophosphamide induced nephrotoxicity. One hundred adult rats of both sexes were used in this study. The animals were randomly enrolled into ten groups of 10 rats each. On day eight, animals were sacrificed and blood collected for the measurement of serum superoxide dismutase 1, glutathione peroxidase; and kidney extracted for histological examination. Vitamin B2 and vitamin B12 significantly ($P$<0.05) increase superoxide dismutase 1, glutathione peroxidase; and the combination of vitamins produce significant ($P$<0.05) increase in superoxide dismutase 1 and glutathione peroxidase compared to the corresponding levels in other groups; and improve histopathological changes compared to cyclophosphamide-treated rats. In conclusion both vitamins may have nephroprotective effects against cyclophosphamide-induced nephrotoxicity.

***Key words:*** *Cyclophosphamide, Vitamin B2, Vitamin B12, Nephrotoxicity, Rats.*

## Introduction

Cyclophosphamide (CPA), an alkylating agent that widely used either alone or in combination with other agents for the treatment of different types of cancers and also as immunosuppressant [(1)], however its' use associated with varying adverse effects including nephrotoxicity [(2)]. Authors reported that the nephrotoxicity induced by CPA is due to active metabolites [(3)]. Furthermore, the nephrotoxicity caused by CPA can lead to variable reduction in glomerular filtration rate (GFR) along with tubular dysfunction [(4)]. Histologically in CPA-treated rat, kidneys showed glomerular nephritis, interstitial oedema and cortical tubular vacuolization in addition to that lysosomal enzymes activities were decreased and protein contents were increased with renal damage was consequently produced [(5)].

Vitamin B2 (Riboflavin) is a water soluble vitamin [(6)] which present in a wide sources of foods [(7)]. Such vitamin is important precursor for two active cofactors which are flavin adenine dinucleotide (FAD) and flavin mononucleotide (FMN) which participate in a wide range of redox reactions which in turn protect the body against variety of oxidative stress conditions [(8)]. Vitamin B12 is a generic name for a specific group of cobalt-containing corrinoids [(9)]. Cobalamin acts as cofactor for enzymatic conversion of homocysteine to methionine and also for conversion of methylmalonic acid (produced when proteins in the body are broken down) to succinyl-CoA [(10)].

Aim of this study to investigate the effects of vitamin B2 and vitamin B12 on cyclophosphamide induced nephrotoxicity.

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## Materials and Method

**Experimental study:**

One hundred healthy adult albino rats of both sexes, weighing 180-220gm were used in this study; they were obtained from and maintained in the Animal House of the College of Pharmacy, Baghdad University under conditions of controlled temperature. The animals were fed commercial pellets and tap water *ad libitum* throughout the experiment period.

**Drugs**

Cyclophosphamide vial (500 mg) was purchased from Baxter, USA. Vitamin B2 capsule (400 mg) was purchased from Amazing nutrition, USA. Vitamin B12 tablet (1 mg) was purchased from TQ pharma, Japan.

**Experimental protocol**

The experimental rats were randomly divided into ten groups (10 rats/group) as follows:

**Group I:** Rats IP injected 1ml/kg/day normal saline for 7days; as control group. **Group II:** Rats IP injected with single dose of cyclophosphamide (CPA) (150 mg/kg). **Group III:** Rats orally-administered 10 mg/kg/day vitamin B2 for 7 days. **Group IV:** Rats orally-administered 40 mg/kg/day vitamin B2 for 7 days. **Group V:** Rats orally-administered 0.1 mg/kg/day vitamin B12 for 7 days. **Group VI:** Rats orally-administered 10 mg/kg/day vitamin B2 for 7 days and a single IP injection of 150 mg/kg of CPA at day 7. **Group VII**: Rats orally-administered 40 mg/kg/day vitamin B2 for 7 days and a single IP injection of 150 mg/kg of CPA at day 7. **Group VIII:** Rats orally-administered 0.1mg/kg/day vitamin B12 for 7 days and a single IP injection of 150 mg/kg of CPA at day 7. **Group IX**: Rats orally-administered a combination of 10 mg/kg/day vitamin B2 and 0.1 mg/kg/day vitamin B12 for 7 days and a single IP injection of 150 mg/kg of CPA at day 7. **Group X:** Rats orally-administered a combination of 40 mg/kg/day vitamin B2 and 0.1 mg/kg/day vitamin B12 for 7 days and a single IP injection of 150 mg/kg of CPA at day 7.

24 hour after the end of the treatment duration (i.e. at day 8), rats were euthanized by diethyl ether. 8 ±1 ml of blood was obtained by intracardiac puncture and was collected in gel and clot activator tubes to obtain serum for the determination of SOD1, and GP levels.

**Histological examination**

Kidney of each rat was prepared for histological examination according to the method of Junqueira [11].

Statistical Analysis

Data were expressed as the mean values, mean±standard error of the mean (SEM). Unpaired Student t-test was used for testing the significant difference between two groups. The statistical significance of the differences among various groups was determined by one-way analysis of variance (ANOVA). Differences were considered statistically significant for *P*-value less than 0.05.

## Results

**Effects on serum superoxide dismutase1 (SOD1)**

There were non-significant differences *(P*<0.05) in serum SOD1 level in groups of rats orally-administered vitamin B2 for one week (**Groups III,** and **IV**) respectively and vitamin B12 alone for one week (**Group V**) compared to that level in control (**Group I**) rats. Mean±SEM of serum SOD1 levels were respectively, 2.93±0.004, 2.94± 0.005, 2.95±0.009, and 2.92 ± 0.005. Furthermore, rats IP injected with CPA at day 7 (**Group II**) caused significant reduction (*P*<0.05) in serum SOD1 level compared to that level in rats of **Group I**. Mean±SEM of serum SOD1 levels were respectively, 0.95±0.011 and 2.92±0.016. Table 1

Moreover, there were significant elevation (*P*<0.05) in serum SOD1 level in **Groups VI, VII, VIII, IX,** and **X** of rats each compared to **Group II** rats. Mean±SEM of serum SOD1 levels were respectively, 1.15±0.003, 1.36±0.03, 1.58±0.003, 1.78±0.007, 2.04±0.034, and 0.95±0.011. Furthermore, table 1 showed that there were significant elevation (*P*<0.05) in serum SOD1 level in **Groups IX**, and **X** compared to the corresponding serum level in rats of **Groups VI, VII and VIII**. Mean±SEM of serum SOD1 levels were respectively, 1.78±0.007, 2.04±0.034, 1.15±0.003, 1.36±0.03 and 1.58±0.003.

**Effects on serum glutathione peroxidase (GP) levels**

Table 1 showed that there were non-significant differences *(P*<0.05) in serum GP level in groups of rats orally-administered vitamin B2 for one week (**Groups III,** and **IV**), and vitamin B12 for one week (**Group V**) each compared to the corresponding serum level in control (**Group I**) rats. Mean±SEM of serum GP levels were respectively, 331±0.611, 332±0.689, 332±0.465 and 330±0.527. Furthermore, rats IP injected with CPA at day 7 (**Group II**) caused significant reduction (*P*<0.05) in GP serum level compared to the corresponding serum enzyme level in control (**Group I**) rats. Mean±SEM of serum levels of GP were respectively, 169±0.603 and330±0.527. Moreover, there were significant elevation (*P*<0.05) in serum GP levels in **Groups VI, VII**, **VIII**, **IX**, and **X** rats compared to the corresponding serum levels in **Group II** rats. Mean±SEM of serum levels of GP were respectively, 216±0.588, 239±0.997, 243±0.683, 269±0.662, 297±0.741, and 169±0.603. Furthermore, table 1 showed that there were significant elevation (*P*<0.05) in serum GP level in Groups **IX**, and **X** of rats compared to the corresponding serum level in rats of **Groups VI, VII and VIII**. Mean±SEM of serum GP levels were respectively, 269±0.662, 297±0.741, 216±0.588, 239±0.997 and 243±0.683.

**Table 1. Effects of various treatments on serum superoxide dismutase 1 and glutathione peroxidase levels in rats**

| Group/Treatment | Superoxide dismutase1(SOD1) ng/ml | Glutathione peroxidase (GP) pg/ml |
|---|---|---|
| Group I | 2.92± 0.005a | 330±0.527a |
| Group II | 0.95± 0.011g | 169±0.603g |
| Group III | 2.93 ± 0.004a | 331±0.611a |
| Group IV | 2.94 ± 0.016a | 332±0.689a |
| Group V | 2.95 ± 0.003a | 332±0.465a |
| Group VI | 1.15 ± 0.011f | 216±0.588f |
| Group VII | 1.36 ± 0.030e | 239±0.997e |
| Group VIII | 1.58 ± 0.011d | 243±0.683d |
| Group IX | 1.78 ± 0.007c | 269±0.662c |
| Group X | 2.04 ± 0.034b | 297±0.741b |

Each value represents mean ± standard error of means (SEM).

Values expressed in small letters (a, b, c, d, e, f, and g) are significantly different (*P*<0.05). Number of animals in each group=10.

**Histological examination of rats' kidney tissue**

Rats IP injected with 1ml normal saline (**Group I**, control), orally-administered vitamin B2 (**Group III** and **Group IV**, respectively), and orally-administered vitamin B12 (**Group V**) each for 7 days showed normal kidney section, that characterized by thin glomerular basement membrane, cellularity and patent capsular space surrounding proximal and distal convoluted tubules. Figures (1-A, 1-B, 1-C and 1-D) respectively.

The kidney section from **Group II** rats IP injected with CPA showed dilatation of bowman space and renal tubules with fibroid tissue and massive apoptosis. Figure (1-E).

The kidney section from **Group VI** rats' orally-administered vitamin B2 for 7 days prior to IP injection of CPA at day 7 showed those histological changes; where, normal glomeruli with dilatation of bowman capsule space, degeneration of renal tubules and numerous apoptosis. Figure (1-F).

The kidney section from **Group VII** rats' orally-administered vitamin B2 for 7 days prior to IP injection of CPA at day 7 showed that atrophy of glomeruli with degeneration of renal tubules and vacoulation with numerous apoptosis compared to G**roup VI** rats. Figure (1-G).

The kidney section from **Group VIII** rats' orally-administered vitamin B12 for 7 days prior to IP injection of CPA at day 7 showed an atrophy of glomeruli, degeneration of renal tubules and numerous apoptosis. Figure (1-H).

While, kidney sections from **Group IX and Group X** rats orally-administered combination of each of vitamin B12 dose with vitamin B2 respectively for 7 days prior to IP injection of CPA; there were atrophy of glomeruli with dilatation of bowman capsule in addition to mild degeneration of renal tubules, and limited number of apoptotic cells. Figures (1-I and 1-J) respectively.

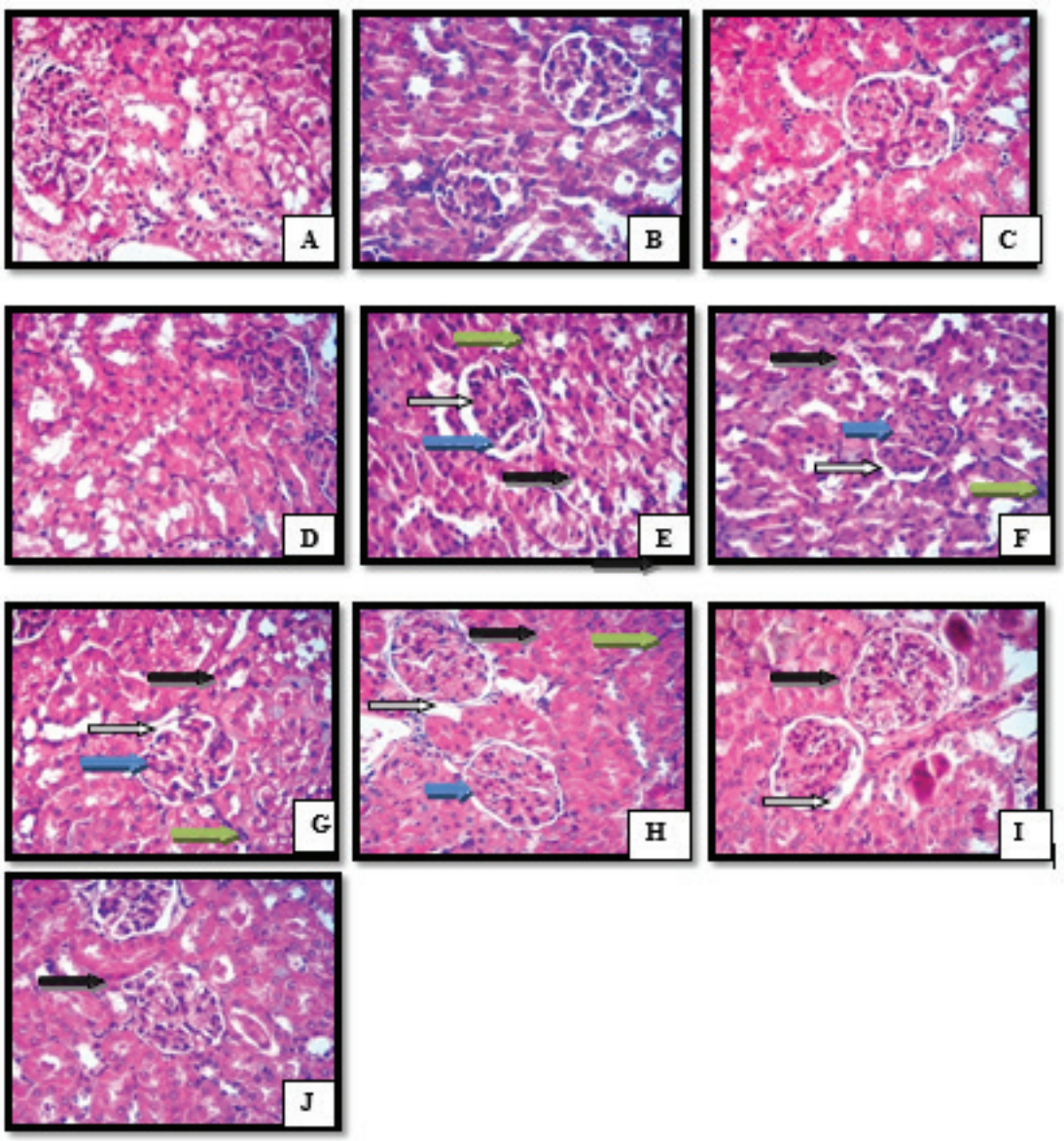


**Figure 1. Histopathological sections of kidney in various experimental rats' groups; (Hematoxylin and eosin; X40). Atrophy of glomeruli (blue arrow), dilatation of bowman capsule (white arrow), apoptotic cells (black arrow), fibroid tissue (green arrow).**

## Discussion

In this study rats IP injected with CPA at day 7 (**Group II**) caused significant reduction in both serum SOD1 and GP levels ($P$<0.05) compared to that levels in control (**Group I)** rats; these reductions may be due to the oxidative stress (OS) formation, which may responsible for CPA-induced nephrotoxicity; results of this study are coinciding with the work of Singh *et al* (2011) where, the OS was reported to be a possible pathological mechanism of nephrotoxicity-induced by CPA that can reduce both SOD1 and GP levels in serum [12].

Also, results of this study showed that orally-administered vitamin B2 in dose-dependent manner prior to CPA (**Group VI and Group VII**) significantly ($P$<0.05) elevate serum SOD1 and GP levels compared to such levels in CPA-treated rats (**Group II**); furthermore, the combination of different doses of vitamin B2 with fixed dose of vitamin B12 prior to CPA (**Group IX and Group X**) caused significant ($P$<0.05) elevations in serum SOD1 and GP enzymes levels compared to those levels in CPA-treated rats (**Group II**); moreover, there were significant ($P$<0.05) elevations in serum levels of

SOD1 and GP enzymes in rats of **Group IX and Group X** compared to corresponding enzymes levels in rats of G**roup VI, Group VII and Group VIII**; these effects could be explained that the antioxidant function of riboflavin could be attributed to the glutathione redox cycle, the reduction-oxidation reactions of riboflavin itself, and the riboflavin effects on antioxidant enzymes activities [13, 14]. Reduced glutathione (GSH), the active form of this antioxidant during its antioxidant activity, can be oxidized (GSSG), that mean inactive, thus, requiring a reduction through glutathione reductase (GR) to regain its antioxidant activity [15]. This enzyme requires the flavin adenine dinucleotide (FAD) coenzyme form of vitamin B2 for this reduction reaction; thus, emphasizing the important role of vitamin B2 in the formation of reduced, active (GSH); in fact, Dey S and Bishayi B (2016) reported that GSH levels were reduced following a decrease in riboflavin intake [16].

Also in this study, orally-administered vitamin B12 prior to CPA (**Group VIII**) produced significant ($P$<0.05) elevations in serum SOD1 and GP levels compared to those levels in **Groups II**, **VI and VII** of rats; these effects could be explained that vitamin B12 may act as antioxidant; where, its antioxidant function could be attributed to the following mechanisms: the enzymatically-processed vitamin B12 acts as a direct superoxide scavenger [17]; furthermore, vitamin B12 may indirectly stimulate ROS scavenging by preservation of glutathione, which likely involves an intricate network of reactions that has not been fully elucidated [17]; moreover, vitamin B12 might protect against (low-grade) inflammation-induced OS by modulating the expression of cytokines and growth factors [18, 19].

In this study, histopathological examination of kidney section of rats IP injected with CPA at day 7 **(Group II)** confirmed the nephrotoxicity; where kidney section of such rats showed renal cell disorganization and vacuolated glomeruli and renal tubules in addition to degeneration of renal tubules with fibroid tissues and massive apoptosis were observed; moreover, marked renal cells degeneration with frequent nuclear pyknosis, irregular darky-stained cells with pyknotic nuclei that are surrounded with halos arrows were prominent in figure (1-E). These findings are coinciding with the work of Hamdi A *et al* (2016) [20].

Concerning histological examination of kidney section of rats of **Groups VI, VII**, **IX** and **X**; there were improvement of the histopathological kidney lesions in all treated groups mentioned above [figures (1-F, 1-G, 1-I and 1-J)] compared to **Group II** (CPA-treated) rats [figure (1-E)]. Results of this study are in agreement with the study of Hajihashemi S *et al* (2017); where, a protective effect of vitamin B2 against nephrotoxicity was observed by histopathological examination [21]. Concerning histological examination in rats' kidney section performed in the present study, the effect of vitamin B12 orally-administered prior to CPA (**Group VIII**), showed that there were improvements of the histopathological kidney lesions in rats of (**Group VIII**) [figure (1-H)]compared to sections of rats' kidney of (**Group II**) (CPA-treated) figure (1-E). In this study, results are also in agreement with those performed others; where, a protective effect of vitamin B12 against nephrotoxicity was observed by histopathological examination [21]. In conclusion both vitamins may have nephroprotective effects against cyclophosphamide-induced nephrotoxicity.

**Acknowledgment :** The authors gratefully thank the College of Pharmacy, University of Baghdad, for supporting the present work.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# Investigating the Effect of *Lymnaea auricularia* (snail) Powder on Different Species of Pathogenic Bacteria

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## Abstract

The aim of this study was to investigate the antibacterial activity of ***Lymnaea*** *auricularia* (snail) tissue powder and shell powder against different human pathogenic bacteria (*Escherichia Coli, Pseudomonas aeruginoa* and *Klebsiella pneumonia*). Four concentration was tested (75,100.125,150) mg\ml of the powder with well diffusion assay. The highest activity of shell powder was in *E. Coli* at 75mg\ml concentration(19mm) inhibition zone, while the highest activity of tissue powder was in *P. aeruginoa* at 150mg\ml concentration with inhibition zone (28 mm). The powder extracts ' antimicrobial activity reveals that they may have biologically active metabolites.

***Keywords*****:** *Lymnaea auricularia. Antibacterial Activity. Human Pathogens.*

## Introduction

Mollusca phylum is considered for example the following generality widespread brute phylum including 100,000-200,000 types through over 52,000 types be situated specified and recognize [1,2]. Mollusca integrate a diverse extent of faunae and it is divided into Scaphopoda, Snail, Cephalopoda, Bivalvia, Polyplacophora, Caudofoveata, Solenogastres, and Monoplacophora [1,3]. Gastropod (snails) is the most diverse group of Mollusca, evaluated approximately 80,000 to 100,000 evaluated sorts [4,5]. Snails have colonized very different ecosystems from an ecological point of view, representing unified marine, aquatic and terrestrial taxonomic orders [6,7]. The snail includes Algae eater, deposit feeders, detritophages, herbivores, predators, filter- eater, ecto- and endoparasites [8]. those are smooth body beasts that are shielded via a solitary helical also limy shell that differs in volume, constitute and color. Snail be situated of economic importance for example a protein origin, ornament, coloring also remedy, Moreover, as a part of the natural diet for fish and birds, these species are important in the marine food chain [9,10].

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## Material and Methods

Snail Collection

Snails were purchased from Al-ghazel market in the middle of Baghdad governorate. The samples were taken to the laboratory, water cleaned to remove sand and other dust particles [11].

### Identification of snails

Specimens were confirmed and identified by Dr.Muhannad Ramzi , the snail was identified according to the whorls number and the opening position[12].

### Preparation of snail powder

With the aid of a small hammer, the shells of the snail are broken and the meat was collected in clean containers or sterile beakers**,** then the meat was kept for 72 hours in the incubator at 55 ° C. The dried samples of snails were powdered into fine powder using mortar [11]. The shell was washed, cleaned, dried in an incubator at 55°C and crushed before it was blended into fine powder

using commercial milling machine [13].

**Culture media preparation**

The media was prepared according to manufacturing companies ' instructions, then disinfected via pressure chamber at 121 °C for 15 minutes under pressure 15bar/ Inch2, then poured in to sterilized petridishes after cooling to 45°C, incubated at 37°C for 24 periods for sterility then stocked by 4°C till utilize.

**The tested microorganisms**

The tested bacteria used in this study were pathogenic bacteria which were obtained from culture collection of higher studies Labrotory / department of biology /college of science / mustansiyrih university, which included three species of bacteria: (*Kleibslla pneumonia, Pseudomonas auergunosa, Escherichia coli*).

**preparation of the concentrations of snail powders against tested bacteria**

The snail powder was prepared as mentioned and four concentration prepared by adding distil water to powder. These concentrations prepared as following: 75mg/ml was prepared by adding 375mg of the powder to 5ml distil water. 100mg/ml was prepared by adding 500mg of the powder to 5ml distil water.

125mg/ml was prepared by adding 625mg of the powder to 5ml distil water. 150 mg/ml was prepared by adding 750mg of the powder to 5ml distil water [14].

**Antimicrobial activity of the prepared snail powder against tested bacteria**

Muller-Hinton a gelatinous substance dishes be situated utilized of vulnerability experiment through a gelatinous substance fully distribution procedure. Antibacterial activity was carried out by using standard well diffusion method [15,16]. This method is based on the observation the effect on the growth of microorganisms in plate. Bacteria used in this test are: (*K. pneumonia. auergunosa , E. coli*). Bacterial suspension was prepared by picking 4-5 colonies of each original bacterial isolate and suspended in a test tube containing 5 ml of normal saline, then adjusting turbidity to approximately 1.5x108 CFU\ml (MacFarland tube). A portion of the bacterial suspension was carefully and evenly transformed on the Mueller-Hinton a gelatinous substance medium by a sterile cotton swab. Wells was made in a gelatinous substance medium with the use of a cork borer. and then it was left for 10 min. After 10 min, about 100 µl of varying concentrations of each powder (75mg/ml, 100 mg/ml, 125 mg/ml, and 150 mg/ml) be additional in the hole and the dishes be situated nurtured aimed at 24 periods by 37 ° C. A scale was used to measure the diameters of the inhibition region [14].

**Result**

**Identification of the snail**

The snail has been described as *Lymnaea auricularia* based on its characteristics of morphology and physiology, which was confirmed by Assistant Prof. Dr Muhannad Ramzi, the length of the *L. auricularia* ranged from 1-4 cm and the weight of the whole body ranged from 2-6 g.

**Figure(1): *Lymnaea auricularia* snail**

**The effect of *Psudodontopsis euphraticus* snail shell powder and tissue powder on pathogenic bacteria**

*L. auricularia* powder was tested for antibacterial activities against three pathogenic bacteria (*Escherichia coli*, *Pseudomonas aeruginosa, klebsiella pneumonia*). Four concentration of the snail shell powder and snail tissue powder (75,100,125,150) mg/ml with well diffusion assay was used. The results were summarized in Table (1) and table (2)

**Table (1): Effect of different concentration of snail shell powder**

| **Pathogenic Bactria** | **Concentration &inhibition zone** | | | |
|---|---|---|---|---|
| | **75** | **100** | **125** | **150** |
| Klebsiella pneumonia | 12 | 14 | 15 | 12 |
| Psendomonas Aeruginoa | 11.4 | 14 | 16 | 16.5 |
| Eschericchia coli | 19 | 14.8 | 16.7 | 18 |

At 75mg\ml concentration *E. Coli* also showed the largest inhibition zone (19 mm), *K. pneumonia* (12 mm) and *P. aeruginoa* (11.4 mm). In concentration of 100mg\ml *E. Coli* showed the largest inhibition zone (14.8 mm) while both of *K. pneumonia* and *P. aeruginoa* were (14 mm). At 125 mg/ml concentration appeared high inhibition effect in *E. Coli* which was (16.7 mm) then *P. aeruginoa (*16 mm) and *K. pneumonia* (15 mm). The highest activity of powder at 150 mg\ml concentration was appeared in *E. coli* with inhibition zone (18 mm) followed by *P. aeruginoa with* inhibition zone (16.5 mm) *K. pneumonia* (12 mm).as shown in table (1) and figure (2).

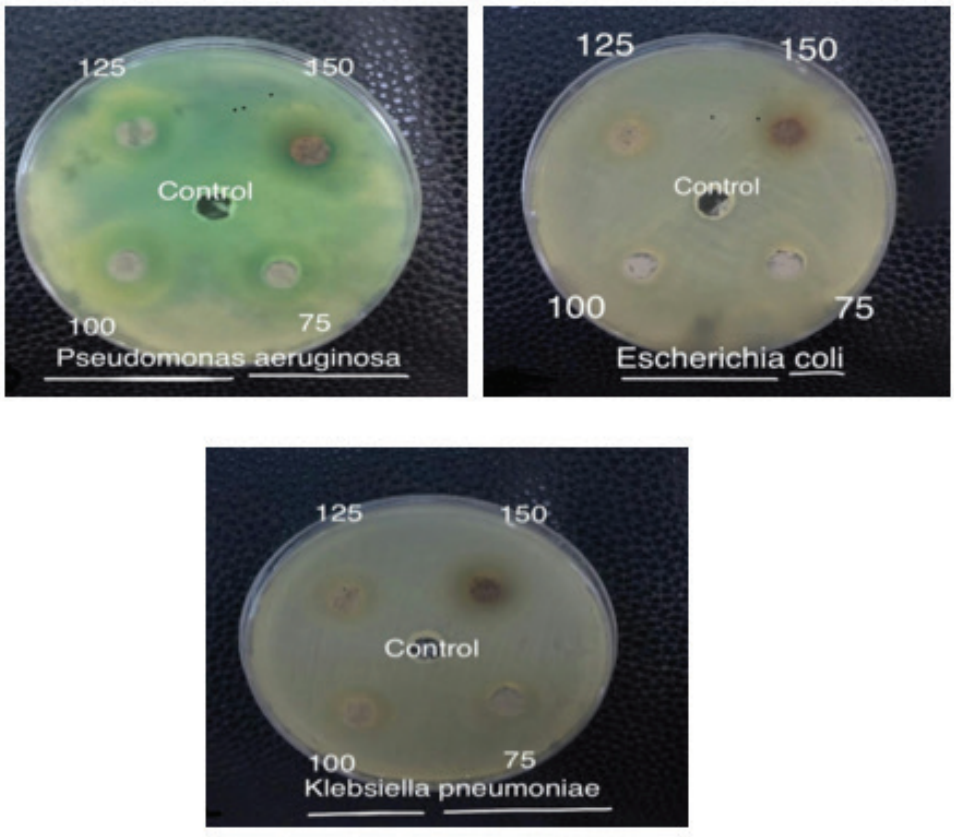
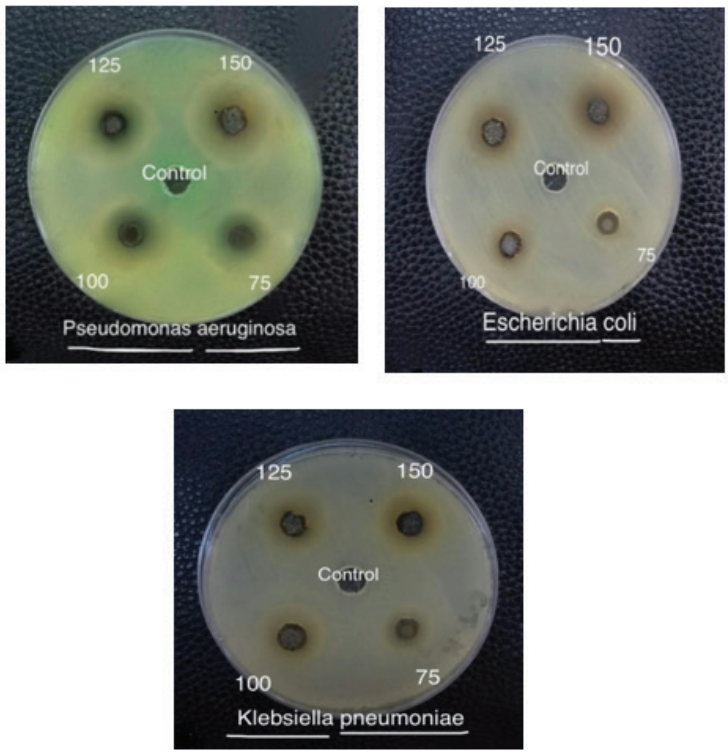



**Figure (2): Antibacterial activity of *Lymnaea auricularia* snail shell powder against bacterial isolates**

**Table (2): Effect of different concentration of snail tissue powder on bacteria**

| **Pathogenic Bactria** | **Concentration &inhibition zone** | | | |
|---|---|---|---|---|
| | **75** | **100** | **125** | **150** |
| Klebsiella pneumonia | 12 | 15 | 16 | 16.2 |
| Psendomonas aeruginoa | 15 | 22 | 25 | 28 |
| Eschericchia coli | 12 | 12.5 | 16 | 20 |

At 75mg\ml *P. aeruginoa* (15 mm), both of *E. Coli* and *K. pneumonia* were (12 mm). At 100mg\ml concentration *P. aeruginoa* (22 mm), *K. pneumonia* (15 mm) and *E. Coli* (12.5 mm). The concentration of 125mg\ml showed activity in *P. aeruginoa* (25 mm), both of *K. pneumonia* and *E. Coli* were (16 mm).The highest activity appeared in *P. aeruginoa* (28 mm) at 150mg\ml concentration followed by *E. Coli* (20 mm) then *K.pneumonia* (16.2 mm) as shown in table (2) and figure (3).




**Figure(3): Antibacterial activity *Lymnaea auricularia* snail tissue powder against bacterial isolates**

## Discussion

Molluscs are commonly used for various studies in international research institutions, but those possess be situated identified as per possibility origin about antiseptic and antimycotic metabolites only recently. It has identified and characterized some of the molecules involve in the antimicrobial activities [17].

Every year, extra than 100 novel antimicrobial composites own stayed isolated as of aquatic, animal lacking a backbone like snail and bivalves, which exhibit a wide range of antimicrobial properties [18,19]. extra than 1,000 novel composites own be situated identified as of

aquatic animal lacking a backbone for instance peptides, terpenes, polypropionates, nitrogen component, polypeptides, macrolides, prostaglandins also greasy acidulous output, sterols and other components [19].

In this study the highest activity of snail shell powder appeared in *E. coli* (19mm), and the highest activity of snail tissue powder exhibited in *P. aeruginoa* (28mm). This powder may have the potential to destroy the bacterial cell by inhibiting gene expression or have the ability to destroy cell membrane by pore formation ,altering the level of intracellular ions or changing the trans membrane potential.

Agreed with Lekshmi *et al.* [14] who investigated the antibacterial activity of *Pomacea insularium* snail tissue powder against (*Klebsiella sp, E. coli, Pseudomonas sp, Proteus sp, Salmonella sp, Aeromonas sp, Streptococcus sp, Staphylococcus sp, Bacillus sp* and *Enterobacter sp)*. the maximum activity was found against *Proteus sp.* (30.16±0.76 mm), greed by Elezabeth *et al.* [20] Record peak antibacterial activity against *klebsiella sp* and *Enterobacter sp* (20 mm).

The aim of the research by Darwin *et al.* [21] be situated to explore the germicide vigor of *Purfura bufo* aquatic gastropod similar with this study. Estimated antimicrobial activity in *Purfura bufo* body tissue extracts against *Pseudomonas aeruginosa, Bacillus subtilis, Escherichia coli, Klebsiella pneumoniae,* the extreme suppression region stayed detected in *K. pneumonia* (26 mm). The *Purpura bufo* species displayed possible antimicrobial activity against pathogenic microorganisms.

Gayathri *et al.* [22] concluded that *Pila viren* freshwater snails contain different bioactive compounds (proteins, peptides and sterols) and may be recommended as pharmaceutical-relevant freshwater snail.

Disagreed with Anand & Edward [23] examined five *Cypraea* species (*Cypraea errones, C. arabica, C. onyx, C.tigris* and *C.vitellus*) which stayed tested for those antiseptic and antimycotic effectiveness, the water solvent showed no activity against *Klebsiella pneumoniae, Pseudomonas aeruginosa* and *Escherichia coli.*

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest**: The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# Effects of Simvastatin and/or Metformin Administration on Lipid Profile and Reproductive Function in Adults Male Rats

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## Abstract

**Background** : HMG-CoA reductase inhibitors, are large used lipid lowering medical that are effective in the functions of male reproductive. In addition, Metformin is affected on level of cholesterol that results in production of sperm. This study was designed to evaluate whether influence of simvastatin, metformin alone and combination in male rats. **Methods**: In this experiment 24 adult male rats were randomly divided into four groups(n=6) as following: control group (G1). 2nd group(G2)20 mg/kg simvastatin. 3rd group(G3)150mg/kg of metformin. 4th group(G4)150mg/kg metformin + 20m/kg simvastatin. The administration rout by oral gavage for 40 days. **Results**: There is a significant increase ($P \leq 0.05$) in blood parameters, HDL cholesterol, blood glucose, total protein and sperm abnormality in treated groups. Histopathological study of testes reveals degeneration, vacuolation of germinal epithelium, destruction the wall of some seminiferous tubules. Liver tissue shows dilated, congested sinusoid, vacuolation of hepatocytes and central vein congestion, on the other hands, kidney reveals a vacuolation of some epithelial lining of glomeruli and renal tubules, atrophy of some glomeruli and dilation of bowman`s capsules. **Conclusion**: Simvastatin have a better effect on lipid profile. On the other hands, have more effects on testicular function.

***Key Words:*** *Metformin, Simvastatin, HMG-CoA reductase.*

## Introduction

Statin affect cholesterol synthesis and thus may be contribute in inhibits steroidogenesis[(1)]. Due to their cholesterol-decreasing properties, this class of inhibitors might be expected to have adverse effects on reproduction by reducing the supply of circulating cholesterol which is required for steroidogenesis [(2)]. Nevertheless, HMG-CoA reductase inhibitors are considered teratogenic due to studies conducted with lovastatin [(3)], and sporadic testicular effects have been observed in dogs [(4,5)]. Metformin controlling blood glucose level. Metformin works by helping to restore the body's response to insulin. It decreases the amount of blood sugar that the liver produces and that the intestines or stomach absorb [(6)]. Metformin have a positive impact on sperm quality, this due to it is ability to reduce oxidative stress and lipid peroxidation, enhance 5'-AMP activated protein kinase activity, and restore the normal levels of pituitary-gonadal hormones [(7)].

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## Materials and Methods

This study was conducted in College of Pharmacy and it's approved by the ethical committee in the College. In this study,24 adults male rats (335 -365 g) were used. Rats housed in plastic cages (2 rats /cage) under standard laboratory conditions (12/12 light/dark cycle, 22 ± 2 ˚C), they are allowed for pellet and tap water.

### Experimental design

Animals are divided randomly into 4 equal groups (n=6). The control group dosed with D.W. for 40days, simvastatin group 20mg/kg simvastatin, metformin group 150mg/kg metformin, simvastatin (20mg/kg) and simvastatin + metformin group dosed 20mg/kg simvastatin and 150 mg /kg metformin. Blood was

collected from inferior vena cava, serum was stored in Eppendorf tubes at -20C°. Blood glucose was measured according[8], total cholesterol (TC)[9], Triglyceride (TG) [10], HDL cholesterol with total cholesterol[11]. VLDL according[12]. Sperm count according[13]. Individual sperm motility according[14]. The organs fixed in 10% formalin, stained with H&E and examined under light microscopy.

## Statistical Analysis

The data were expressed as mean ±Standard deviation (SD), ANOVA analysis in our study. Least significant difference (LSD) was used to test the differences among means, indicated a significant (P<0.05), using computerized SPSS v3.

## Results

### 1.Biochemical tests and Sperm analysis

Table(1) showed that was a significant increase (P≤0.05) in HB, PCV, RBCs and WBCs count of simvastatin group compared with control and other treated groups. While, it showed a significant decrease in PTL count of all treated groups compared with control group.

Table (2); the serum cholesterol, TG, and VLDL cholesterol level of sim, metf, and co-treated sim with metf groups were significantly lower than control group (P≤0.05). While, markedly increase level of HDL cholesterol was observed in sim rats compared with control and other treated rats. Also, serum level of LDL cholesterol remained elevated in the control and metf rats compared with sim and co-treated rats.

Effects of metformin and simvastatin on serum blood glucose and plasma total proteins in adults male rats was shown in table (3). Compared with met, and co-treated sim-metf grups the serum level of blood glucose were significantly higher in group sim (p≤0.05). On the other hand, the level of total proteins in co-treated group were significant higher than all groups are studies. However, simvastatin, metformin and co-treated rats showed a significant increase in abnormal sperm morphology compared with control.

**Table (1) Effect of metformin, simvastatin and co-administration of metf. and simv. on blood parameters. (M±SD)(n=6)**

| Parameters groups | HB g/dl | RBC ×106cell/mm3 | WBCs ×103cell/mm3 | PCV % | PLT % |
|---|---|---|---|---|---|
| G1 cont. | 13.25±0.6 d | 6.06±0.1 d | 11.51±0.2 b | 37.53±1.9 C | 443±25.8 a |
| G2sim | 15.61±1.1 a | 6.39±0.4 a | 14.63±2.5 a | 39.44±0.2 a | 269±43.8 d |
| G3metf | 14.26±0.8 c | 6.10±0.2 c | 9.96±1.1 d | 36.46±1.5 d | 410±15.2 b |
| G4sim,metf | 14.68±06 b | 6.37±0.2 b | 11.31±0.6 c | 38.71±3.5 b | 363±25.8 c |
| LSD | 0.41 | 0.02 | 0.20 | 0.72 | 24.81 |

***The different letters refer to significant differences among groups at level of (p≤0.05).***

**Table (2) Effect of metformin, simvastatin and co-administration of metf. and sim. on lipid profile. (M±SD) (n=6)**

| Parameters groups | Chl. mg/dl | Tg. mg/dl | HDL mg/dl | VLDL mg/d | LDL mg/dl |
|---|---|---|---|---|---|
| G1 cont. | 203.68±2.7 a | 157.61±9.5 a | 71.36±3.7 d | 31.52±1.9 a | 99.065±25.5 a |
| G2sim | 176.06±7.4 d | 78.38±8.0 d | 185.01±5.5 a | 15.73±1.6 d | 66.06±7.9 c |
| G3metf | 181.85±9.5 b | 123.08±7.3 b | 84.23±4.9 c | 24.61±1.4 b | 97.04±0.5 a |
| G4sim,metf | 181.11±11.8 c | 104.60±2.4 c | 145.65±10.5 b | 20.83±0.5 c | 85.13±12.9 b |
| LSD | 0.73 | 18.46 | 12.87 | 3.77 | 2.61 |

***The different letters refer to significant differences among groups at level of (p≤0.05)***

**Table (3) Effect of metformin, simvastatin and co-administration of metf. and sim. on blood glucose and total proteins. (M±SD)(n=6)**

| Parameter groups | Blood glucose g/dl | Total proteins g/dl |
|---|---|---|
| G1cont. | 177.10±28.0 a | 14.23±1.3 d |
| G2 sim | 184.06±8.2 a | 17.61±1.9 b |
| G3met | 117.33±37.3 b | 16.75±0.6 c |
| G4sim,met | 140.83±21.9 b | 17.71±1.8 a |
| LSD | 36.33 | 0.10 |

The different letters refer to significant differences among groups at level of (p≤0.05)

**2.Histopathological study**

**1. The Testes**

Testes of control rat include normal seminiferous tubules. Testes of rat treated with simvastatin(20mg/kg B.W), shows degeneration with vacuolation of germinal epithelium and irregularity of basement membrane. Few numbers of spermatogonia as well as necrotic spermatocytes in some seminiferous tubules. Testes of rats treated with metformin (150 mg/kg b.w) shows vacuolation of germinal epithelium. There few numbers of spermatogonia. Testes of rats treated with simvastatin(20mg/kg b.w)and metformin(150mg/kg b.w) shows disarrangement, sever sloughing of epithelium and destruction the wall of some seminiferous tubule. There is a lot of number of spermatids in seminiferous tubules.

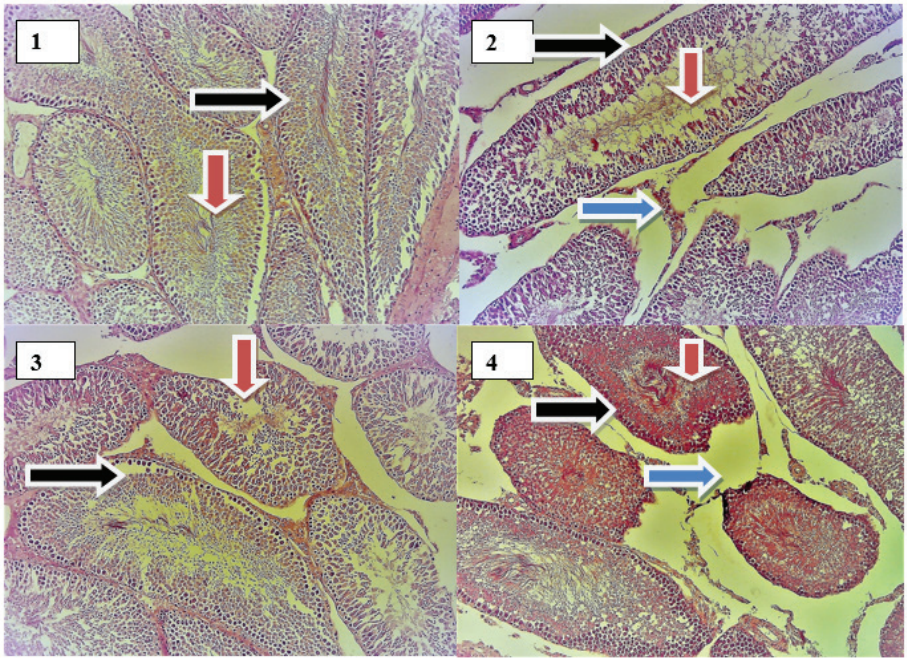



**Figure (1): tests of control, normal structure (black arrow) full with sperm(red arrow). (2): tests of rat treated 20mg/kg simvastatin, degeneration in addition to vacuolation (red arrow) (3): tests of rat treated 150mg/kg metformin, vacuolation &degeneration(red arrow).(4):tests of rat treated simvastatin and metformin, thickens within semineforus tubules and vacuolization(red arrow). H&E, 200x.**

### 2. The Liver

The liver tissue of control group has shown normal liver tissue. The cellular cords separated by sinusoids. The plate hepatic cells were separated by narrow, congested blood sinusiods with vacolation of hepatocytes(figure 2). Also there is vacuolization of hepatocytes, congested central vein, enlarged sinusoid(figure 2). Hepatic nuclei are enlarged pyknotic and light chromatinic stained, disappearance of the radiated hepatic architecture, massive vacuolation in hepatocyte, the central vein thick and narrow(figure 2).

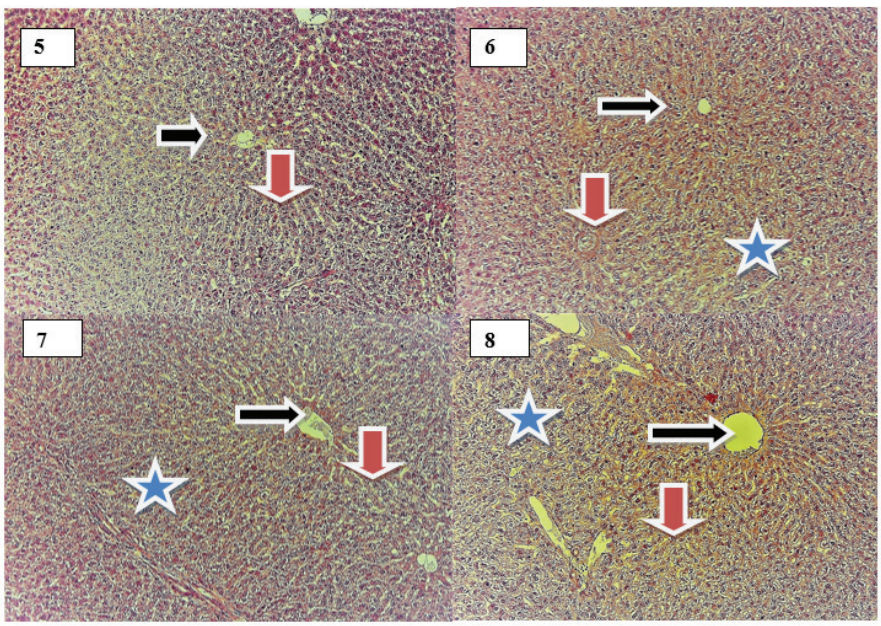
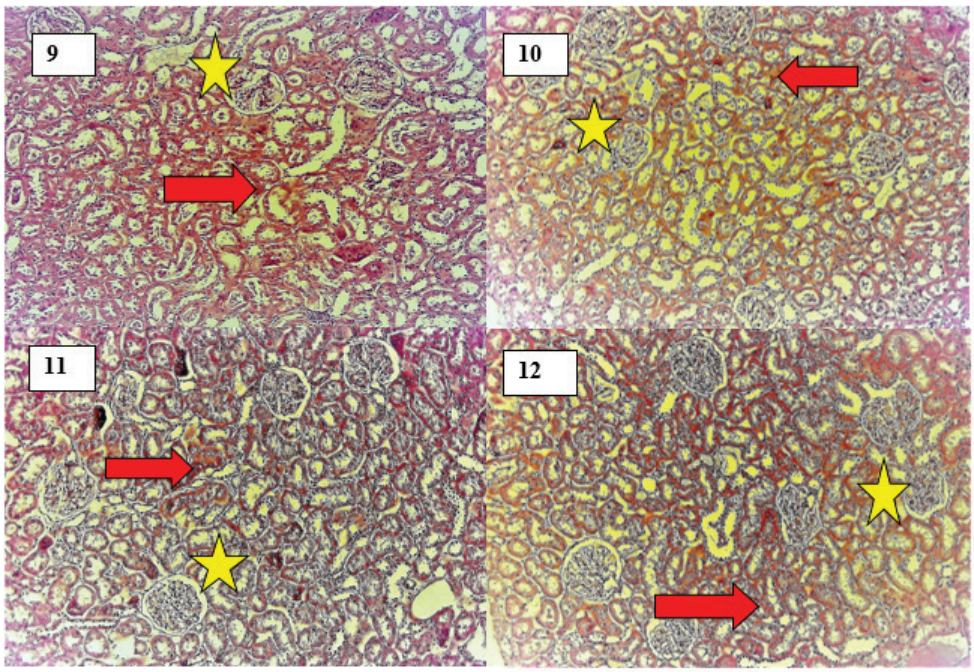



**Figure (2): liver control rat (black arrow) and hepatocytes (red arrow).(6): liver of male rat exposed 20mg/kg B.W.of simvastatin, vacuolization (blue star), congested of sinusoid (red arrow).(7): liver of male rat exposed 150mg/kg B.W.of**

**metformin,vacuolization, congested central vein(black arrow),enlarged sinusoid (blue star).(8): liver of male rat exposed 20mg/kg B.W. of simvastatin and 150 mg/kg B.W of metformin, vacuolated hepatocyte. H&E, 200x.**

3. The Kidney

**The kidney of control shown normal** renal tissue(figure 3). Kidney of rats exposed to 20mg/kg B.W simvastatin, **shows** necrosis of the epithelial lining of glomeruli and tubules and glomerular atrophy(figure 3). Kidney of rat exposed to 150mg/kg B.W. of metformin, **shows** enlargement of glomruli with dilatation of bowman's capsule and hemorrhage between tubules(figure 3). Kidney of rat exposed to 20mg/kg B.W of simvastatin and co-treated with 150mg/kg B.W. of metformin, **shows** atrophy of glomeruli with narrow of bowman's capsule and hemorrhage between tubules(figure 3).




**Figure(3): kidney of control rat show normal glomeruli(star)and tubules(red arrow).(10): kidney of rat 20mg/kg B.W. of simvastatin, necrosis of the epithelial glomeruli, tubules(star), atrophy of glomeruli(red arrow). (11):kidney of rat 150mg/kg B.W.of metformin, enlargement of glomeruli, dilatation of bowman's capsule(star), hemorrhage between tubules(red arrow). (12): kidney of rat 20mg/kg B.W of simvastatin and 150mg/kg B.W. of metformin, glomerular atrophy , narrow of bowman's capsule (star), hemorrhage(red arrow). H&E, 200x.**

## Discussion

The continues increasing of glycosylated hemoglobin as product of diabetic related with glucose over all in blood is give form to changes of Hb structure, this factors could have contribute to increase in all blood cells. Therefore, hyperglycemic increases the blood cells count[(15)]. Hence, the altered in blood picture (RBCs, WBCs, PCV, and PLT) may presented in table(1)[(16)]. Another interesting finding of our study is that the effect of simvastatin, metformin & combination on lipid profile in which there is a significant decrease in lipid profile of all treated groups in comparison to control group while there is a significant increase in HDL in simvastatin group when compared with untreated rats as shown in table (2). Our result is in line with[(17)] who mentioned that there is a decrease in all lipid profile in mice treated with atorvastatin.

Several studies showed that rats treated with metformin cause a decrease in lipid profile, while the addition of natural honey to metformin significantly decrease all type of cholesterol and has a better effect in comparison to metformin alone in diabetic rats[(18,19)]. Our results are also in agreement with Wang etal[(20)], who observed that the level of TC, TG significantly decrease & the HDL cholesterol increase in diabetics rat treated with simvastatin drug. Bellia etal, mentioned

that random clinical studies of patient treated with simvastatin drug at dose 20mg/day has no effect on glucose level control for 4weeks of treatment, also found that glycemic control and HbA1c may worsen with increase duration of treatment till 1year with no change in insulin sensitivity[21,22].

Result in table(3)revels the increment in glucose level in rats treated with statin drug significantly in comparison to those treated with metformin &the combination of these two drugs, this result may be related to the effect of statin drug on islet of Langerhans which may effect on their ability to secret insulin or may be due to decrease the sensitivity of insulin which lead to increase insulin resistance and increase glucose level. This result is in agreement with[23,20] they both reported that simvastatin associated with an increase in serum glucose level and impaired glucose homeostasis in patients and rats respectively.

The present study showed an effect of simvastatin, metformin and their combination on sperm count, motility and normal morphology presented as a decrease in sperm characteristics, on the other hands, these drugs also increase the abnormality of sperm morphology in comparison to control group , this result is in agreement with[24] who mentioned that a decrease in testes weight, low sperm count, motility and abnormal morphology of semen in rat administered high dose atorvastatin.

Adaramoye and Lawal,[25]; Banihani,[26] they mentioned that administering of metformin in rat may have a positive effect on sperm characteristics especially in diabetic rat and at dose 30mg/kg per day for 6weeks. While administering of metformin for 3 weeks at the same above dose in rat associated with a decrease in semen count and motility by 33%[27]. Our results corresponding with histopathological study of testes tissue associated with degeneration, vacuolation of epithelium, sloughing in germinal epithelium and spermatocytes necrosis in some of seminiferous tubules, this results is in line with(28,29) they reported that rat treated with rousovastatin and atorvastatin respectively cause changes in seminiferous tubules, death of some germinal epithelium and edema in interstitium.

Drugs exposed to metabolism by liver and kidney tissue, therefore histopathological study of these organs associated changes including dilation of liver sinusoid, vacuolation of hepatocytes and congestion of hepatic sinusoids. Kidney associated with excretion of drugs metabolites therefore in some field showed atrophy of some glomeruli, dilation of bowman`s capsules and degeneration of some glomerular cells. These changes occur as an adaptation of these organ to accommodate the continuous administration of these drug, therefore considered as reversible changes and the organs can back to normal state if the cause annotate[30].

**Ethical Clearance**

The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# Parkinson's Disease Follow Up Self-Assessment Scale

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## Abstract

Parkinson's disease is a neurodegenerative progressive disorder end with independency for many years at late life, leading to great burden on patient and family life. The available treatment is symptomatic focused on improving life quality of the patient and it's in need for good communication with the physician.

So far there is no easy and practical way for follow up, thus we've designed the Parkinson's disease follow up self-assessment scale aiming to detect ON and OFF time, it's include PD manifestations, medications and medications adverse effects filled out by the patient family at home in order to mailing it to the physician, and intend to testing it by comparing the performance of patient family with expert staff in using the scale at hospital for 24 hours. Then enquiring about difficulty of using the same scale at home.

A 44 PD patient were completed the study. All items accuracy filling out was 93.4% in compare to expert staff. Its mean degree of difficulty was 4/10 and among patients families only 29.54% consider it difficult to use. The ON and OFF time was detected precisely in 92.2% by follow up physician. The proposed scale is precise in detection ON an OFF time and not difficult to use.

***Keywords:*** *health; patient; self-assessment scale; disease*

## Introduction

Per neurodegenerative disorder Parkinson's disease (PD) prevalence ranked next to Alzheimer's disease[1]. Worldwide about 10 million people are living with PD[2]. Although it's progressive, the parkinsonians life is slightly shorter than general population[3] and survive approximately 10.3 years from onset[4] but more than half of patients will lose the ability to live independently and become in need for secondary care after 5 years of onset[5].

Moreover after several years of L-dopa treatment the patients eventually present with more complications mainly motor fluctuations[6] and dyskinesia particularly young patients[8] leading to deterioration of patient life and rising caregiver burden[7] necessitating frequent medication adjustment. To delay motor fluctuations progression [9] each patient needs best regimen therapy, and in order to improve regimen efficacy an early detection of motor fluctuations is essential [10].

Consequently management of Parkinson's disease is complex with early involvement of neurological or elderly services. PD Patients significantly had more emergency unit visits and physician consultation mainly attributed to medications response[11].

Till now the main parameter to evaluate therapeutic efficacy is ON and OFF time[10]. Thus, obtaining precise timing of ON and OFF is necessary for providing optimal therapeutic regimen for each patient individually [12]. Currently, to assemble such data the available methods consists of either self-reporting diaries[13] or Inertial Sensor[14]. Both are either not always available or difficult to perform. While Unified Parkinson's disease Rating Scale [15] is suitable for staging and needs expert supervision.

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Most of guideline encourage the participation of PD patient in judgements about their own care and nessisate the alerting of patient and family members about PD disorder and medications problems [9]. The Shared decision making practice is offering an opportunity of treatment preferences to the patient including therapeutic regimen[16]. PD had its impact on patient daily life activities (drinking, swallowing, dressing, walking etc.)[15]. And practically the patient and his family are more familiar with the patient daily difficulties, so they can provide precise information about the patient condition. Hence engagement of patient can be expanded to include gathering information about his condition which may make a change in regimen selection.

At early stage of PD it's important to decide when to initiate and electing suitable medication and follow up is vital for validation of effectives of regimen. While in later stages a best regimen selection is individual and may requiring a secondary care and specialist services. So follow up of PD patients is in need for effective way of communication with the clinicians. Hence we aimed to design and testing a simple scale filled out at home by the PD patient himself or one of his family member to be useful for follow up even without patient attendance.

## Method

The proposed scale designed to follow PD manifestations and adverse effects of medications each hour in relation to time of medication intake, meal and sleep time. The evaluation of each item relying on patient difficulty in performing usual life activities. Basically the system of scaling estimate the level of difficulty in performing each activity considering a value of (+ = ON) when patient finish the task normally or Have difficulty but still helpful for others, (0) score when patient not in need for assistance or help to complete the task but he is not helpful, whereas (- = OFF) scoring when he is in need for assistance or help or completely dependent. (Table 1)

In consistent with the United Kingdom PD Society Brain Bank diagnostic criteria[17], a 48 PD patients were admitted for one day to Al- Diwaniyah teaching hospital neurology center with one of the patient family member. Both learned to fill out a proposed scale (Table 2). For each patient; two copy of same scale were filled one by patient or family member and the second by expert staff at same time.

At home, each PD patient or family member asked to use the same scale for a random days / month for 3 months and mailing a copy to the neurology center.

In addition, the PD patient and family member asked to evaluate the proposed scale by a questionnaire enquiring about the difficulty of using the scale ranging from 1 to 10 and whether its adding more information to the family about PD manifestations, medications and medications adverse effects as YES or NO for each.

Via another questioner the PD patients following physicians evaluating the precision of ON and OFF timing for each patient by YES or NO.

**Table 1: The basic system of scale.**

| Level of performance | | Manifestations | | | | | | Adverse effects | |
|---|---|---|---|---|---|---|---|---|---|
| | | Tremor | Dressing | Walking | Bed turning | swallowing | Swallowing | Dyskinesia | Hallucination |
| ON | Normal Or Have difficulty but still helpful | +2 | | +2 | | | | | |
| | | +1 | +1 | +1 | +1 | +1 | +1 | +1 | +1 |
| | Not needs for help or assistance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OFF | In need for assistance or help | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| | Completely dependent | -2 | -2 | -2 | -2 | -2 | -2 | -2 | |

Name: Date:

**Table 2: Parkinson's disease follow up self-assessment scale.**

| **Write the score for each item below corresponding to time** | | | | | | | | | | | **Mark by X the items corresponding to time** | | | | | | | | | | |

## Results

A 44 (91.7%) PD patient were complete the study, 4 (8.3%) patients are not compliance, 25 (56.8%) were male whereas 19 (43.2%) were female, age range was (46 - 87) years average 71 years.

Each item of the proposed scale were filled accurately by the patient in compared to expert staff as following; time 44 (100 %), tremor 44 (100 %), dressing 42 (95.5%), walking (100%), bed turning 41 (93.2%), swallowing 44 (100%), speech 38 (86.4 %), dyskinesia 32 (72.7 %), hallucination 39 (88.6%), drugs 40 (90.9%) and impulsive disorders 44 (100%). All items accuracy filling out was 93.4%. (Table 3)

The difficulty in filling the scale 7-10, 4-6, 0-3 / 10 for the participants was 11 (25 %), 20 (45.4 %), 13 (29.54%) sequentially, mean degree was 4/10 (Table 4) (Figure 1). Families awareness about PD were become better by acquiring more knowledge were 34 (77.3%), 37 (84.1%), 41 (92.2%) family for PD manifestations, medications and medications adverse effects consecutively (Table 5).

The ON and OFF time sensitivity by the proposed scale was precise in 41 (92.2%) patients. (Figure 2)

**Table 3: The accuracy of items filling of proposed scale.**

| Item | Patients | Expert | % |
|---|---|---|---|
| Time | 44 | 44 | 100 % |
| Tremor | 44 | 44 | 100% |
| Dressing | 42 | 44 | 95.5% |
| Walking | 44 | 44 | 100% |
| Bed turning | 41 | 44 | 93.2% |
| Swallowing | 44 | 44 | 100% |
| Speech | 38 | 44 | 86.4 % |
| Dyskinesia | 32 | 44 | 72.7 % |
| Hallucination | 39 | 44 | 88.6% |
| Drugs | 40 | 44 | 90.9% |
| Impulsive disorders | 44 | 44 | 100% |
| Sum | 452 | 484 | 93.4% |

**Table 4: The level of difficulty of scale to the patient or family member.**

| Difficulty / 10 | 0-3 | 4-6 | 7-10 |
|---|---|---|---|
| Participant number | 16 | 20 | 8 |
| Percentage | 36.4% | 45.4 % | 18.2 % |

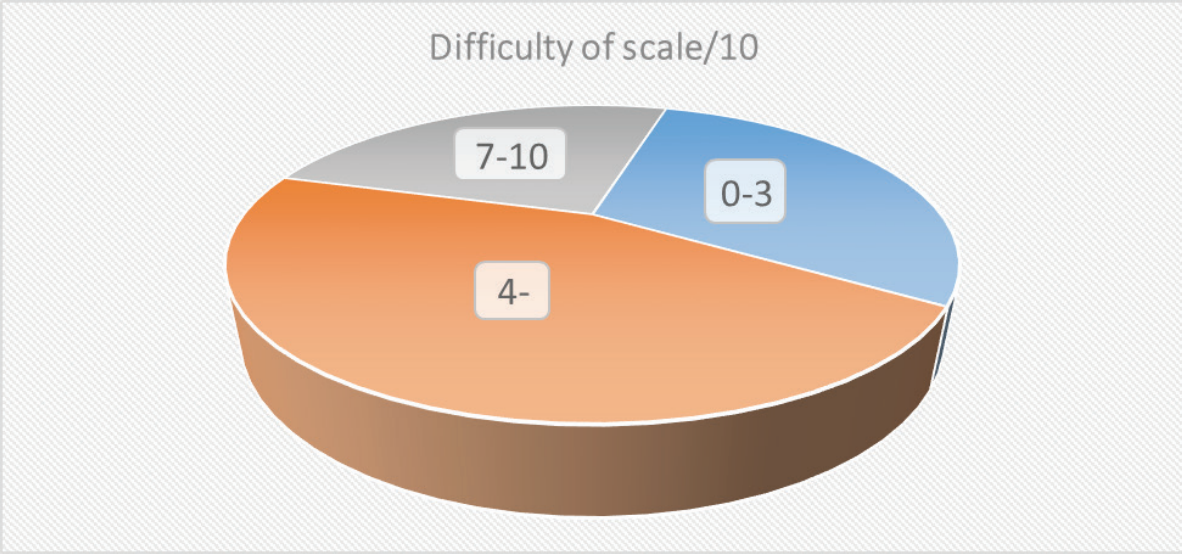


**Figure 1: The level of difficulty of scale to the patient or family member.**

**Table 5: Families acquired more knowledge about PD.**

| Item | Number | % |
|---|---|---|
| Manifestations | 34 | 77.3% |
| medications | 37 | 84.1% |
| adverse effects | 41 | 92.2% |
| Sum | 112 | 84.8% |

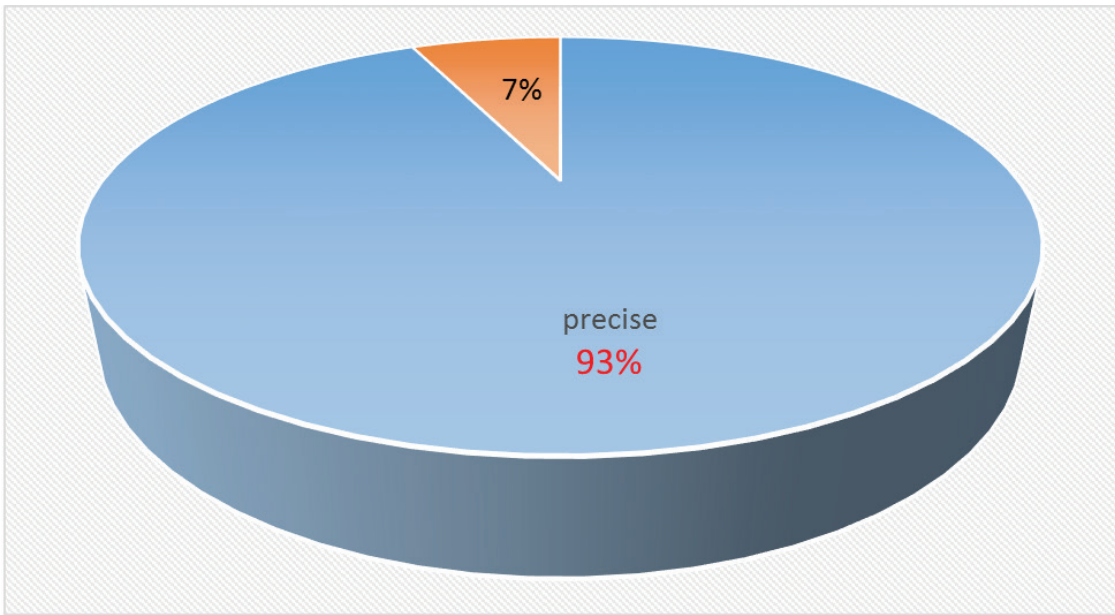


**Figure 2: The ON and OFF time sensitivity of scale.**

## Discussion

For all items the scale were filled out accurately in 93.4% by the patient or his family member in comparison to professionals so generally it's sensitive and reliable for detecting patient condition.

Although 4 (8.3%) participants were not completed the study, but 91.7% completed it with mean degree of difficulty was 4/10. Concluding it's practical and not difficult.

The proposed scale add extra information about PD and its medications to the patient families and make them more familiar in 84.1%, so it's serving the aim of patient education.

The identification of ON and OFF time was precise in 41 (92.2%) patients indicating a high sensitivity which is the main aim of the scale. **The scale designed to demonstrate patient condition each one hour which can be manipulated to 2,3,4 hours according to patients condition , a result of + (green zone) equivalent to ON while - (red zone) resemble OFF (table 1).**

At early stage its helping to decide when to initiate treatment and election of suitable medication since it demonstrate the main disabling feature either in the pole of tremor or rigidity and hypokinesia. While in later stages it helping in validation of effectives of regimen and assisting in selection of the best regimen individually or the need for secondary care and specialist services. **The scale weighing the medications adverse effects with the** ON time for adjusting proper dose and timing medications intake with meals and sleep.

## Conclusion

The proposed Parkinson's disease follow up self-assessment scale is useful for following PD patients since it's practical and sensitive as verified by all results. It can be used patient family, career, and nursing staff. It's not difficult, precise in detection ON an OFF time without patient attendance or hospitalization.

### Recommendations

We recommend to test the same scale in other neurological centers with different communities and arranging for an internet page or application for easy communication between patients and physicians.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict Of Interest**: The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# Dental Caries among Mental Patients in Kerbala-Iraq in 2019

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## Abstract

Background: The world is facing an epidemic of dental caries, which affects all age groups, and the problem is clearer among specific risk groups such as mental patients. This problem has a great impact on humanity, on oral health, on quality of life and general health, economic, social and esthetic drawbacks. **Patients and methods:** A cross-sectional prospective study covered 124 mental patients visiting a private psychiatric clinic in Kerbala city. clinical diagnosis and medication history were registered. In addition, oral examination was conducted to determine DMFT index diagnose other dental manifestations (plaque and hairy tongue), and xerostomia was investigated through a specific questionnaire. **Results and discussion**: Dental caries and poor oral health of 124 patients with equal gender distribution and a mean age of 35.04±12.52 year. More than three quarters of the sample had dental caries of at least one tooth with significantly higher prevalence among females. DMFT value >2 was encountered in 54% of females compared to 42% of males. Teeth brushing was never or irregularly performed by two thirds of the patients and was a high significant predictor of total DMFT, Decay and Missing component. A great majority (85%) had xerostomia, 50% had plaque staining, 13% had bruxism, 9% had hairy tongue and 3% had denture some of these conditions were positively associated with DMFT or its components. **Conclusions:** Especial attention needs to be paid for the oral health of mental patients the xerostomia encountered as a side effect of most medicines in these patients could influence oral health in general and dental caries in particular.

***Keywords:*** *Dental caries, DMFT index, Mental patients, Kerbala*

## Introduction

The World Health Organization (WHO) put since 1948 three main pedicles for health, namely physical, mental and social. Mental disorders and dental caries are highly prevalent in all regions of the world and the former represent a major source of disability and social burden worldwide [(1)]. The WHO estimated that one quarter of the world population will be affected by mental or neurological disorders at some point in their lives and around 450 million people currently suffer from such conditions [(2)], and the burden has risen by 41% in the last two decades [(3)]. In the Eastern Mediterranean Region (EMR), mental disorders contributed to 5.6% of the total disease burden in 2013 [(4)]. It was found in a global epidemiological review that in spite of the measures to combat dental caries; its prevalence is increasing [(5)], and dental caries and periodontal disease are in fact the two most common oral diseases [(6)]. Additionally, a recent systematic review found a significant negative correlation between dental caries indices with the socioeconomic and educational level [(7)]. Although many psychological disorders are associated with comorbid physical illnesses such as cardiovascular diseases and cancer and death [(8)], less attention has been paid to the issue of oral health [(6, 9, 10)], and these physical impacts are further deteriorated by the chronic intake of large amount of alcohol, or illicit drug use, prevalent among mental patients [(11, 12)]. The reasons behind these higher rates of oral diseases among mental patients include: their lower motivation toward oral health maintenance, ignorance, lower immunity, drugs side effects, iatrogenic, and many other factors [(6, 13, 14)]. It has been found that psychiatric patients in general had a worse DMFT score, worse oral hygiene and increased frequency of periodontitis [(5, 15)]. A systematic review of literature between 1971 and 2009

estimated a substantial reduced optimal oral health (61%) among individuals with serious mental illnesses [16]. On the other hand, reduced saliva (quantity and quality) as medicines side effect [17]; deprives these patients from many protective functions: antimicrobial, buffering, and lubricating agent that promotes cleansing and removal of food debris within the mouth and maintaining oral mucosa and teeth mineralization [18]. A recent study among internally people in Baghdad, reported positive association between DMFT index and severity of depression, while a second study put forwards the hypothesis behind this association [19, 20]. The mentioned association was extensively investigated by a large sum of references, globally [15, 21]. Little previous published study investigated oral health of mental patients while many others surveyed mostly schoolchildren. The mean DMFT values for a random sample of 516 students (13-15 year) in Mosu1 was 5.17. Significant predictors were age and gender (more caries females) in many studies [22, 23]. poor among a rural population in a village in Mosul was also reported in Mosul in 2006 [24].

## Patients and Method

The study was conducted in a private psychiatric clinic in Karbala/Iraq during the period from 1st April till 31st May 2019. All patient who accepted to undergo oral health examination. All the patients suffering from any systematic disease (hypertension and diabetes mellitus) or pregnancy excluded. Demographic and the xerostomia criteria test reported by Fox [25], were obtained before oral examination. In addition, the entire patient undergo to. The statistical analysis us included descriptive and analytic methods using SPSS-23 at a significance level of <0.05.

## Results

The mean age of the patients was 35.04±12.52 year, and the gender proportions were almost equal. Only one third of the patient reported brushing their teeth regularly, against one third who never brushed their teeth. The smoking prevalence among the sample was 14.5%, while only four patients (1.6%) reported alcohol consumption. For the number of used medications, four fifths of the patients were on one to three medications, whilst only one fifth reported no current medication (table 1).

**Table 1: The main demographic and other characteristics of the mental patients in Kerbala/Iraq in 2019 (n=124)**

| Variable | Group | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 61 | 49.2 |
| | Female | 63 | 50.8 |
| Age category | Below 20 year | 15 | 12.1 |
| | 20-29 year | 26 | 21.0 |
| | 30-39 year | 41 | 33.1 |
| | 40-49 year | 25 | 20.2 |
| | 50 year or more | 17 | 13.7 |
| Tooth brushing | Never | 41 | 33.1 |
| | Irregular | 44 | 35.5 |
| | Regular | 39 | 31.5 |
| Smoking | Smoker | 18 | 14.5 |
| | Non-smoker | 106 | 85.5 |
| Alcohol consumption | Yes | 4 | 1.6 |
| | No | 120 | 98.4 |

***Cont...*** **Table 1: The main demographic and other characteristics of the mental patients in Kerbala/Iraq in 2019 (n=124)**

| | | | |
|---|---|---|---|
| Occupation | Official employer | 21 | 16.9 |
| | Housewife | 51 | 41.1 |
| | Retired | 5 | 4.0 |
| | Private shop | 1 | .8 |
| | Student | 10 | 8.1 |
| | Unemployed | 9 | 7.3 |
| | Laborer | 27 | 21.8 |
| Number of medications taken | 0 | 26 | 21.0 |
| | 1 | 24 | 19.4 |
| | 2 | 38 | 30.6 |
| | 3 | 35 | 28.2 |
| | 4 | 1 | 0.8 |
| Total | | 124 | 100.0 |

Total DMF ranged between 0 and 28 and the mean was 4.76±6.10, with one third of the patients having DMF index >5, while one quarter had an index of zero.

Comparison between male and female patients showed that females had higher DMF index than males 5.06± 5.79 vs. 4.60± 6.64). However, this difference was not significant (p=.428). More than one half of the female patients (53.9%) had a DMFT value >2 compared to only 42.6% of the male patients and this difference was significant (p=.007).For teeth brushing; it was found to be highly significant predictor of oral health indices. The difference in the mean DMF index between those who brush their teeth was highly significantly lower than those who do not (p=.006) and in older patients (p=.049). Similar significant differences were observed among Missing teeth categories (p=.002), while no such difference was found among Decay or Filling categories (p=.763).

The means DMF index and its components (D, M and F) were: 4.94±6.3, 1.88±3.15, 2.29±4.84 and 0,77±1.59, respectively.

Significant Caries Index (SiC Index) is the mean DMFT of the one third of the study group with the highest caries score. The index is used as a complement to the mean DMFT value. In this sample of mental patients the oral health indices for the worst third of the sample showed that the mean DMFT was 12.08± 6.482 (table 2).

**Table 2: The minimum, maximum, mean and standard deviation of the main oral health indices of the mental patients in Kerbala/Iraq in 2019 (n=40)**

| Variable | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|
| D | 0 | 18 | 4.28 | 4.535 |
| M | 0 | 28 | 6.35 | 6.878 |
| F | 0 | 7 | 1.45 | 2.253 |
| DMFT | 0 | 28 | 12.08 | 6.482 |

Tooth filling was the least prevalent among the mental patients, while comparable proportions observed for decay and missing teeth. Caries free patients was 10.48% of the total sample.

Among the total patients; 105 patients (84.7%) had xerostomia according to the xerstomia test, one half of the sample (62 patients) had plaque staining, 16 patients (12.9%) complained of bruxism, 11 patients (8.9%) had hairy tongue and four patient (3.2%) had denture. Cross-tabulation was used through chi-square test in addition to t-test to compare means to predict the association of these factors with DMFT and its components. Plaque staining had highly significant association with decay (p<.001, table 3). Similarly, DMFT was significantly associated with plaque staining (p=.039), but not with missing teeth or filling (p=.632 and .100, respectively). While no other significant association was found except for missing teeth and denture (p=.007).

**Table 3: The distribution Decay categories among mental patients in Kerbala/Iraq in 2019 (n=124)**

| Plaque staining | D Category | | | | Total |
|---|---|---|---|---|---|
| | Null | 1-2 | 3-5 | >5 | |
| Negative | 35 (56.5%) | 22 (35.5%) | 5 (8.1%) | 0 (0%) | 62 (100.0%) |
| Positive | 19 (30.6%) | 22 (35.5%) | 8 (12.9%) | 0 (0%) | 62 (100.0%) |
| Total | 54 (43.5%) | 44 (35.5%) | 13 (10.5%) | 13 (10.5%) | 124 (100.0%) |

p<.001

## Discussion

Dental caries and periodontitis are the most common oral disease globally, and represent the major causes of tooth loss [5-7, 26]. Many psychiatric disorders are associated with dental diseases such as dental erosion, caries, and periodontitis [27].

The reported caries predisposing factors included: age, gender, type and length of psychiatric disorder and treatment and smoking [28].

For this reason, taking a thorough medical history and performing oral examination can assist physicians in delivering best care to these patients. The results of the present study showed that mentally ill patients had poor oral health [27, 28].

A 40 years systematic review suggested suboptimal oral health in approximately two thirds of patients with severe mental illness [16]. While, a systematic review reported (DMF-T) in chronically hospitalized patients with mental disorders a mean score of 26.74 (out of a possible 32), one of the highest reported in the literature [29]. Patients with severe mental illnesses in Western countries were reported to have scores of more than 20 [30].

While a study among 133 outpatient psychiatric patients in India in 2014 reported a mean DMF score of 2.10, which was not significantly associated with age, while, periodontal condition worsened as age increased. The prevalence of caries was 54.89%, in addition to poor hygiene practices. One quarter of those below 50 year had healthy gingiva, in comparison to none of those above 50 year (p<.05) [31]. In addition, a cross-sectional study in a hospital in Lahore/Pakistan reported DMFT at 3.83± 0.469 [32]. It was found that people with severe mental illness have 2.7 times risk of losing all their teeth, compared with the general population [27]. In Iraq, a study among 213 people in village in Mosul reported a men DMFT of 2.42 among 10-19 year age group but increased significantly to 8.73 among those aged ≥40 year, while the proportion of individuals who have missing teeth increased from 14.29% to 73.33% in

these age groups. Only a minority (15.49%) were caries free [24]. While a study among adolescent sample of 981 students reported a mean DMFT of 3.26 and 4.43 for males and females, respectively; with significant difference according to age [23].

In Iraq, a recent study measured DMFS among 121 internally displaced people in Baghdad demonstrated that depression had a negative effect on caries prevalence and severity [19]. The effect of dry mouth is a major risk factor for oral health problems and is often associated with opportunistic gingivitis as a result of nutritional deficiencies secondary to psychosis or anorexia nervosa [30]. A case-control study reported a significantly higher DMFT and its components among hospitalized schizophrenia patients in Belgrade in in 2016 [11].

## Conclusions

Poor oral health among mental patients reflected from the results call for an urgent program to halt the downward progress of oral health in this risky group of patients. Health education concentrating on preventive measures such as tooth brushing and regular checking represents an important tool in this program.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# Treatment of Iraqi People with Hyperkinetic Movement Disorders by Tetrabenazine in Relation to Genetic Polymorphism of CYP450 2D6

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## Abstract

Genetic polymorphism is defined as the inheritance of a trait controlled by a single genetic locus with two alleles in which the least common allele has a frequency of about 1% or greater. The Cytochrome P450 (CYP2D6) enzyme metabolizes about 25% of clinically used drugs from many different drug classes including antidepressants, antipsychotics, antihypertensives, and analgesics. The CYP2D6 is a highly polymorphic gene locus with more than 75 allelic variants, thus subjects can be classified into poor metabolizers (PM), ), intermediate metabolizers (IMs), extensive metabolizers (EM), or ultra-rapid metabolizers (UM) of a given CYP2D6 substrate. By using pharmacogenomics, the pharmacotherapy can be optimized, thereby increasing the treatments overall efficacy and decreasing the incidence of adverse events.

The present study is aimed to predicted phenotypes of CYP2D6 as : poor metabolizers, intermediate metabolizers, extensive metabolizers, and ultra rapid metabolizers for tetrabenazine in patients with hyperkinetic movement disorders compared to healthy subjects in Iraq .

The study was carried on 75 subjects participated (30 male, 45 female) ; fifty of them were with hyperkinetic movement disorders( 25 dystonia , 25 chorea ) the reminder 25 were healthy . Genotyping of CYP2D6 gene was performed by polymerase chain reaction (PCR) conventional (allele specific method). Plasma concentration of Tetraberazine was measured by High-performance liquid chromatography (HPLC) . Data were collected through direct interview with the subjects besides the assessment of genetic polymorphism of CYP 450 2D6 enzyme for Iraqi people.

The results of this study show there were a significant CYP 450 2D6 enzyme polymorphism. the number (percentage) of subjects with CYP 450 2D6 gene polymorphisms was 17 (22.66%) of the total study population. The number (percentage) of subjects with CYP 450 2D6*2 was 58 (76.32%), whereas, subjects with CYP450 2D6 *10 was 17 (22.66%).However , no subjects were observed with CYP 450 2D6 *4 polymorphisms in this study. The tetrabenazine concentration with mean ± SD was 3.08± 0.231 and 2.506±0.235 ng/ml for chorea and dystonia patients respectively , while alpha and beta dihydrotetrabenazine range was 37.72± (2.18 ng/ml _38.13± 2.00 ng/ml ) and (21.376±0.583ng/ml_ 18.252±0.874ng/ml ) respectively .

***Keywords**: CYP 450 2D6 polymorphism, poor metabolizers (PM), intermediate metabolizers (IMs) , extensive metabolizers (EM), tetrabenazine.*

## Introduction

Genetic polymorphism is defined as the inheritance of a trait controlled by a single genetic locus with two alleles in which the least common allele has a frequency of about 1% or greater[1]. In other words, it is a alteration in DNA sequence among individuals, groups, or populations. Polymorphisms can be in the coding regions (where they may be synonymous or nonsynonymous) or, more commonly, in the non-coding regions, and often vary by ethnicity[2].

The Cytochrome P450 (CYP2D6) enzyme metabolizes about 25% of clinically used drugs from many diverse medication classes including antidepressants, antipsychotics, antihypertensives, and analgesics. The CYP2D6 is a extremely polymorphic gene locus with more than 75 allelic variants, and subjects can be categorized into poor metabolizers (PM), extensive metabolizers (EM), or ultra-rapid metabolizers(UM) of a given CYP2D6 substrate[3],[4]. EMs carry at least one CYP2D6 allele viewing normal enzyme function, IMs carry one CYP2D6 allele showing reduced function and another with no CYP2D6 function, and PMs carry two nonfunctional CYP2D6 alleles[5]. ultra-rapid metabolizers, however, carry several copies of functional CYP2D6 genes[6]. The CYP2D6*9, CYP2D6*10, CYP2D6*17, and CYP2D6*41 are the greatest vital intermediate metabolizer (IM) alleles[7], in which CYP2D6*10 (49.5%)[8], CYP2D6*1 (40.1%–43.5%)[9],[10], CYP2D6*2 (11.9%–26.2%)[11], and CYP2D6*4 (0.2%– 2.8%)[7],[9] are the most common CYP2D6 alleles in Asians. About 13%–50% of Asian people may be homozygous for the CYP2D6*10 allele[12]

A cytosine-to-thymine replacement (C>T) at nucleotide 100 in the CYP2D6*10 allele, resultant in a change of proline-to-serine at codon 34, is public between Asian people[13] and is related to reduced metabolism of numerous CYP2D6 substrates[12]. There is a greatly conserved proline-rich zone among microsomal P450s. The proline at codon 34 perhaps performances a center among the lipophilic membrane anchor and the active site (heme moiety) of the enzyme. Alteration of an amino acid in this area may well reduce the activity of the enzyme[14],[15]. The CYP2D6*4 (G1846A) allele results in a splicing defect with nonfunctioning enzyme activity due to change of guanine (G) by adenine (A) at position 1,846. This single base substitution in the intron 3/exon 4 boundary result in move of the consensus acceptor splice site, yielding a spliced messenger RNA with extra base, thus resultant in a early termination codon[16].

**Aim of the study:** The present study is aimed to predicted phenotypes of CYP2D6: poor metabolizers, intermediate metabolizers, extensive metabolizers, and ultra-rapid metabolizers in Iraqi people with Hyperkinetic Movement Disorders treated with tetrabenazin and relation between the genotypes and level of tetrabenazin.

## Subjects and Method

### Subjects

This is a prospective case control study ,that was carried on 75 subjects participated in this research (30 male, 45 female) , attending Baghdad medical city during the period from September 2018 to June 2019. Data were collected through direct interview with the subjects with mean age of 38.81±1.31years . Blood samples were collected at the beginning of the study to measure genetic polymorphism of CYP 450 2D6 enzyme for Iraqi people . The study was approved by the local committee of ethics .

DNA was extracted from whole blood samples using DNA Extraction kit, to be utilized for genotyping of CYP2D6 gene was performed by polymerase chain reaction (PCR) conventional (allele specific method) according to method described by Taimour Langaee, Issam Hamadeh, Arlene B. Chapman, et al[17]. Polymerase Chain Reaction (PCR) was applied using MultiGENE OPTIMAX ( Labnet international, Inc.,USA ).

The following primers were used for PCR amplification.

**1.CYP2D6 *2 (2850 C>T) rs16947**

Forward 5’ GGCCCCTGCACTGTTTCC 3’

Reverse 5’ AAGGGGAACCCTGAGAGC 3’

2. CYP2D6 *4 (1846 G>A) rs3892097

Forward 5’ TGCCGCCTTCGCCAACCACT 3’

Reverse 5’ GCAGAGACTCCTCGGTCTCTC 3’

3. CYP2D6 *10 (100 C>T rs1065852)

Forward 5’ TGTCCAGAGGAGCCCATTT 3’

Reverse 5’ GTCGAAGCAGTATGGTGTGTTCT 3’

The agarose gel electrophoresis used to check the integrity and presence of the extracted DNA, using Mupid-ONE - ADVANCE/Japan. Agarose solution (1.0 %) heated to boiling till all agarose particles melted, and then 1.0 µL of ethidium bromide dye (10 mg/mL) added to agarose solution, then agarose allowed to solidifying

at room temperature onto the gel chamber ,then DNA samples were mixed with three µL of DNA loading dye and loaded in agarose, gel wells .Gel electrophoresis finished at 70 volts for 30 minutes then DNA bands were visualized under UV ray.

Measure Plasma Level of Tetraberazine by HPLC

Plasma about (20 µ1) was injected in to the liquid chromatographic system involving of a Cl8 µ Bondapak column and fluorescence detector. The mobile phase was acetonitrile-1% acetate buffer, pH 4.5 (50: 50) at a flow-rate of l_ml/min. The fluorescence of the eluent was measured using an excitation wavelength of 265 nm and an emission filter (KV418)[18].

## Statistical Analysis

Data will analyze by using SAS (Statistical Analysis System) (version 25.0) program (SPSS Inc., Chicago, Illinois, USA) and Minitab version 17 software. In all comparisons, a p-value <0.05 was reflected statistically significant.

## Results and Discussion

1.Demographic data of the study population

Seventy five subjects included in this study. Demographic data of the subjects was shown in (Table-1).

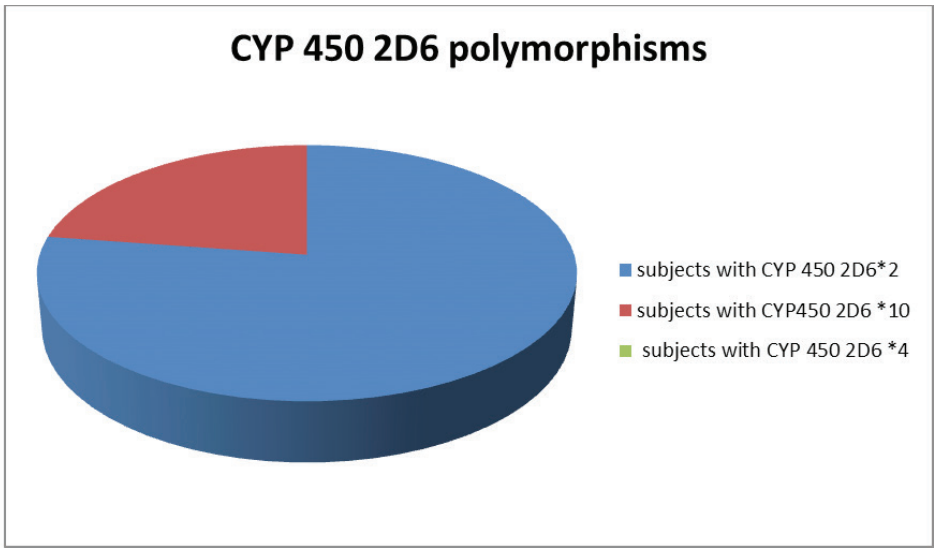
**(Table -1): Demographic data of the subjects** .

| **Data** | **subjects** |
|---|---|
| Age (yrs.) | 38.81±1.31 |
| No. of subjects<br>With Chorea<br>With Dystonia<br>Healthy | 75<br>25<br>25<br>25 |
| Gender | 45 female<br>30 male |
| BMI | 21.987± 0.476 |

Data are expressed as : Numbers, Mean±SE

Distribution of subjects with (CYP 450 2D6 )gene Polymorphism:

Figure (1) shows that the numeral (percentage) of subjects with CYP 450 2D6 gene polymorphisms was 17 (22.66%) of the total study population. The number (percentage) of subjects with CYP 450 2D6*2 was 58 (76.32%), whereas, subjects with CYP450 2D6 *10 was 17 (22.66%).No subjects were observed with CYP 450 2D6 *4 polymorphisms in this study.




**(Figure-1) Histogram showing the distribution of subjects with (CYP 450 2D6) gene Polymorphism**

**Effects of CYP 450 2D6 gene Polymorphism on Tetrabenazine and main metabolites concentrations in plasma :**

Table 2 shows that the plasma concentration tetrabenazine was ranged between 1.2–5.9 ng/ml with mean ± SD 3.08± 0.231 and 2.506±0.235 ng/ml for chorea and dystonia patients respectively , while alpha and beta dihydrotetrabenazine range was 28.1–68.3 ng/ml and 13.65–29.18ng/ml respectively .

**(Table- 2) Plasma concentration of tetrabenazine alpha and beta dihydrotetrabenazine in patient group**

| Substance | Substance concentration for Group A | Substance concentration for Group B |
|---|---|---|
| Tetrabenazine | 3.08±0.231ng/ml | 2.506±0.235ng/ml |
| Alpha-dihydrotetrabenazine | 37.72± 2.18 ng/ml | 38.13± 2.00 ng/ml |
| Beta-dihydrotetrabenazine | 21.376±0.583ng/ml | 18.252±0.874ng/ml |

Data expressed as Mean±SEM. Group A for chorea and group B for dystonia Patients

**plasma concentration of tetrabenazine, alpha and beta dihydrotetrabenazine for patients with CYP 450 2D6 polymorphism versus the patients without CYP 450 2D6 polymorphism in chorea patients using tetrabenazine:**

Table-3 shows that the mean tetrabenazine, alpha and beta dihydrotetrabenazine concentration were increased significantly in patients with CYP 450 2D6 polymorphisms compared to patients without CYP 450 2D6 polymorphisms using tetrabenazine.

**(Table-3) plasma concentration of tetrabenazine, alpha and beta dihydrotetrabenazine for patients with CYP 450 2D6 polymorphism versus the patients without CYP 450 2D6 polymorphism in chorea patients using tetrabenazine**

| Substance | Group | Mean± SD | P-value |
|---|---|---|---|
| Tetrabenazine (ng/ml) | Patients without CYP 450 2D6 polymorphism | 2.467±0.086 | 0.001* |
| | Patients with CYP 450 2D6 polymorphism | 4.657± 0.37 | |
| Alpha-dihydrotetrabenazine (ng/ml) | Patients without CYP 450 2D6 polymorphism | 31.91± 0.56 | 0.001* |
| | Patients with CYP 450 2D6 polymorphism | 52.69± 3.7 | |
| Beta-dihydrotetrabenazine (ng/ml) | Patients without CYP 450 2D6 polymorphism | 19.96± 0.34 | 0.002* |
| | Patients with CYP 450 2D6 polymorphism | 25.01± 0.97 | |

*Significant difference

**5. plasma concentration of tetrabenazine, alpha and beta dihydrotetrabenazine for patients with CYP 450 2D6 polymorphism versus the patients without CYP 450 2D6 polymorphism in dystonia patients using tetrabenazine:**

Table 4 shows that the mean tetrabenazine, alpha and beta dihydrotetrabenazine concentration were increased significantly in the patients with CYP 450 2D6 polymorphisms compared to patients without with CYP 450 2D6 polymorphisms using tetrabenazine.

**(Table-4): plasma concentration of tetrabenazine, alpha and beta dihydrotetrabenazine for patients with CYP 450 2D6 polymorphism versus the patients without CYP 450 2D6 polymorphism in dystonia patients using tetrabenazine.**

| Substance | Group | Mean± SD | P-value |
|---|---|---|---|
| Tetrabenazine (ng/ml) | Patients without CYP 450 2D6 polymorphism | 1.932± 0.10 | 0.001* |
| | Patients with CYP 450 2D6 polymorphism | 4.325±0.34 | |
| Alpha-dihydrotetrabenazine (ng/ml) | Patients without CYP 450 2D6 polymorphism | 33.59± 0.58 | 0.010* |
| | Patients with CYP 450 2D6 polymorphism | 52.5± 4.7 | |
| Beta-dihydrotetrabenazine (ng/ml) | Patients without CYP 450 2D6 polymorphism | 18.25± 0.87 | 0.001* |
| | Patients with CYP 450 2D6 polymorphism | 24.85± 1.1 | |

*Significant difference

Cytochrome P450 (CYP) 2D6 is one of the most examined CYPs in relative to genetic polymorphism, however it is accounts for only a small fraction of all hepatic CYPs (around 2-4%). However, there is a great inter-individual variation in the enzyme action of CYP2D6. The enzyme is mainly non-inducible and metabolizes about 25% of present medications. Typical substrates for CYP2D6 are basically lipophilic bases and include certain antidepressants, antipsychotics, antiarrhythmics, antiemetics, beta-blockers and opioids[19].

The CYP2D6 activity varieties noticeably within a population and consist of ultrarapid metabolizers (UMs), extensive metabolizers (EMs), intermediate metabolizers (IMs) and poor metabolizers (PMs). There is a significant variability in the CYP2D6 allele spreading amongst diverse racial groups, resultant in variable fractions of PMs, IMs, EMs and UMs in a given population. The allele *10 provide a substrate-dependent reduced action. It is reported that alleles *3, *4, *5, *6 and *7 have no enzyme activity[20],[21].Furthermore, no patients were observed with CYP 450 2D6 *4 polymorphisms in this study.

There has been promoting from monitoring a drug level in plasma of tetrabenazine and it's metabolites for hyperkinetic movement disorders and a takings precaution in the polymorphism of CYP 450 2D6 enzyme. The plasma concentration of tetrabenazine after one and half hour for therapeutic efficacy suggested as less than 2.5 ng/ml and Alpha and Beta dihydrotetrabenazine 40.5 ng/ml and 25.7 ng/ml respectively [22].

In the presence of low CYP2D6 activity, dealkylated decreased, and excess intermediate metabolites are stayed in plasma. High alpha-DTBZ concentrations related to increased adverse effect like sedation, insomnia and depression. It proposed that activeof the drug and its metabolism. The range of plasma level of the tetrabenazine found in all patients subject was 3.08±0.231ng/ml with mean ± SD equal to 2.506±0.235ng/ml, were due to the 26% of patients having CYP2D6 polymorphism. This polymorphism significantly affects the plasma concentration of alpha-DTBZ due to change in enzyme activity. Plasma concentration of tetrabenazine was narrow in comparison to its metabolite, which it may be due to the timing of assessment or the small data about the short half-life of the drug about the long half-life of its metabolite. There was a significant increase in plasma concentration of alpha and beta-dihydrotetrabenazine in patients with CYP2D6 polymorphism in comparison to those with nonmutant gene-phenotype that is due to the low activity of the enzyme (31.91± 0.56 vs. 52.69± 3.7) (19.96± 0.34 vs. 25.01± 0.97) respectively for chorea patients, while (33.59± 0.58 vs. 52.5± 4.7) (18.25± 0.87 vs. 24.85± 1.1) for dystonia patients, which results in elevation in the plasma concentration of tetrabenazine (2.467±0.086ng/ml vs. 4.657± 0.37) for chorea and (1.932± 0.10 vs. 4.325±0.34) for dystonia .

## Conclusions

According to the data of the present study, we can conclude that:

There is a relatively high incidence (22.66%) of CYP 450 2D6 gene polymorphisms in Iraqi population and mainly CYP 450 2D6*10 which is intermediate metabolizers (IMs) .

Higher plasma concentration of tetrabenazine among patient with CYP 450 2D6*10 polymorphism in comparison to patient without CYP 450 2D6 polymorphism(2.467±0.086ng/ml vs. 4.657± 0.37) for chorea and (1.932± 0.10 vs. 4.325±0.34) for dystonia .

Depending on the results acquired in this study: Determination a genotype of the CYP 450 2D6 genes in Iraqi patients in relative to the safety and efficacy of drugs that metabolite and to determine the suitable dose for the patient depending on the genotype of the CYP 450 2D6 from one side and the concentration of the drug in the plasma from other side.

**Acknowlogement**: The present work was abstracted from PhD theses submitted to the Department of Clinical Pharmacy, College of Pharmacy, University of Baghdad. The authors gratefully thank Baghdad Teaching Hospital, Medical City and AL-Zahraa Teaching Hospital for supporting the project

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest**: The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# New Record of the Genus *Hydrotaea* Robineau-Desvoidy, 1830 (Diptera, Muscidae) from Kerbala City, Iraq

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## Abstract

The current study showed the genus *Hydrotaea* Robineau-Desvoidy, 1830 recorded for the first time to Iraqi entomofauna and with its two species *H.aenescens* (Wiedemann, 1830) and *H. albuquerquei* Lopes, 1985.The specimens collected from carcasses of dogs. The photos taken by the aid of dino light digital microscope. The identification of diagnostic characters by using many taxonomical keys.

***Key words:*** *Diptera, Forensic Entomology, Hydrotaea, Iraq, Muscidae, Ophyra.*

## Introduction

The genus *Hydrotaea* Robineau-Desvoidy, 1830, belongs to the family Muscidae and is widespread in Palearctic and temperate regions around the world [(1)]. This genus *Hydrotaea* includes more than 130 species [(2-3)].

The members of *Hydrotaea* species were diagnosed by body color metallic black, blue or green or not shining; the compound eyes of male are holoptic and bare; female ocellar triangle shining, short or long, sometimes reaching lunula; antenna dark sometimes with pale base, aristae very short pubescent; gena with or without reclinate strong differentiated seata, the palpi orange- dark black. Thorax with dorsocentral bristles (2+4), notopleuron with two setae equal in size and covered with setulae; anepimeron bare; sub Costa is raining with a fine curve from humeral Cross-vine to Costa, medial vein straight.

Some authors showed the junior synonyms of *Hydrotaea* is *Ophyra* Robineau-Desvoidy 1830, such as: [(2-5)] with diagnostic features as body usually metallic black. Fronto-orbital seta of female are weak and shorter than frontal setae. Ocellar triangle of female almost long and reaching the lunule, gena without setae [(6-8)].

These species of *Hydrotaea* are environmentally important because of their eating habits as predators as well as their presence near residential areas. which are natural sweepers for the disposal of waste and recycling in the environment, so some countries have been breeding and proliferation in nature, as they do not enter the housing does not cause any inconvenience to humans as well as their importance in research Criminal [(9,10)].

Several studies have been conducted on this genus, which contributed to determining the age of the body and time of death (PMI). That its occurrence on human bodies abundantly in the late stages of decomposition within the graves of the burial of the dead, which gave it special importance in future criminal studies [(6) (11-16)]. The larvae of *Hydrotaea* species are predators of the other dipteran larvae and therefore seen in the later stages of decomposition [(2, 10)].

This species of *Hydrotaea* generally associated with environments where temperatures are mild throughout the year as it significantly affects the distribution and growth of these insects, in particular on the immature stages [(17-19)].

## Materials and Method

In this study the specimens were collected from dog carcasses during the period from 1/3/2018 to 28/2/2019, which killed by two methods the first using a sharp knife and the second by a toxic substance (Strychnine sulfatetablet). Use three duplicates in each of the above-mentioned transactions. The flies collected by air net and fly roll trap during the bloating and decaying stages of

carcasses. The specimens were taken to the laboratory and killed by freezing (24h) and so as they mounted by insect pins, the locality and date of collection were recorded [20, 21].

For identification of genus and species were used taxonomical keys such as [6, 7] [16] [22-26] The habitat and morphological features taken photos by the aid of the digital microscope dino-light with scales of measurements.

## Results and Discussion

In the present study, the genus *Hydrptaea* Robineau-Desvoidy, 1830 and its species, *H.aenescens* and *H. albuquerquei*, recorded as new to Iraqi fauna.

***Hydrotaea* Robineau- Desvoidy, 1830**

Synonym: *Ophyra* Robineau- Desvoidy, 1830

*Ophira* Rondani, 1856

*Osphyra* Meade, 1830

*Alloeonota* Schnabl, 1911

**Diagnostic characteristics of the genus *Hydrotaea* Robineau-Desvoidy, 1830:**

These genes can be identify by the diagnosis characters. The body is shining blue-black species (Pl. 1 A, B); the compound eyes of male is holoptic, while in female is dichoptic (Pl.2 A, B); the gena with no distinct setae, frons with the shining ocellar triangle extended more than halfway from front ocellus to lunule (almost reaching to lunule) without dusting.

Key to the two species of *Hydrotaea* Robineau-Desvoidy, 1830

1- Maxillary palp orange-yellow in color (Pl. 4 A); ocellar triangle with a blunt end (pl.3 A), Hind trochanter, on ventral surface, with tuft of fine, hooked setae (pl.5) …….. *H. aenescens* (Wiedemann, 1830)

2- Maxillary palp black-dark brown (Pl.4B); ocellar triangle with a sharp end (pl. 3 B), Hind trochanter, on ventral surface, without tuft of fine setae..... *H. albuquerquei* Lopes, 1985

***Hydrotaea aenescens* (Wiedemann, 1830)**

**Common name:** America black dump fly

Synonym: *Anthomyia aenescens* Wiedemann, 1830

*Anthomyia aenescens* (Wiedemann, 1830)

*Crssopalpus aenescens* (Wiedemann, 1830)

*Ophyra trochanterata* Malloch, 1932

**Materials examined** (37 specimens), at blotting stage (3♂♂; 5♀♀) 20.III.2018; (2♂♂; 5♀♀) 2.XI.2018, at decaying stage (9♀♀; 6♂♂) 21.III. 2018; (2♂♂; 5♀♀) 3-20.XI. 2018.

**Distribution:** America [27]; Hungary [28]; Lebanon, Tunisia, Egypt, Morocco, Britian and Irlend [29]; Turkey [30]; Argentina [24] as *Ophyra aenescens*; Belgian cost [31]; Portugal [32]; Argentina [23]; Finland [33]; Weatren Palaearctic Region [10]; Bulgaria [8].

***Hydrotaea albuquerquei* Lopes, 1985**

**Common name:** black dump fly

Synonym: *Hydrotaea oides* Skidmore, 1985

*Ophyra albuquerquei* Lopes, 1985

**Materials examined** (30 specimens), at blotting stage (2♂♂; 5♀♀) 20.III.2018; (1♂♂; 4♀♀) 2.XI.2018, at decaying stage (8♂♂; 4♀♀) 21.III. 2018; (2♂♂; 4♀♀) 3-20.XI. 2018.

**Distribution:** Brasil [17] [34]; Neotropical Region [35]; South America [6]; in southern Brazil [36]; Peru [37].

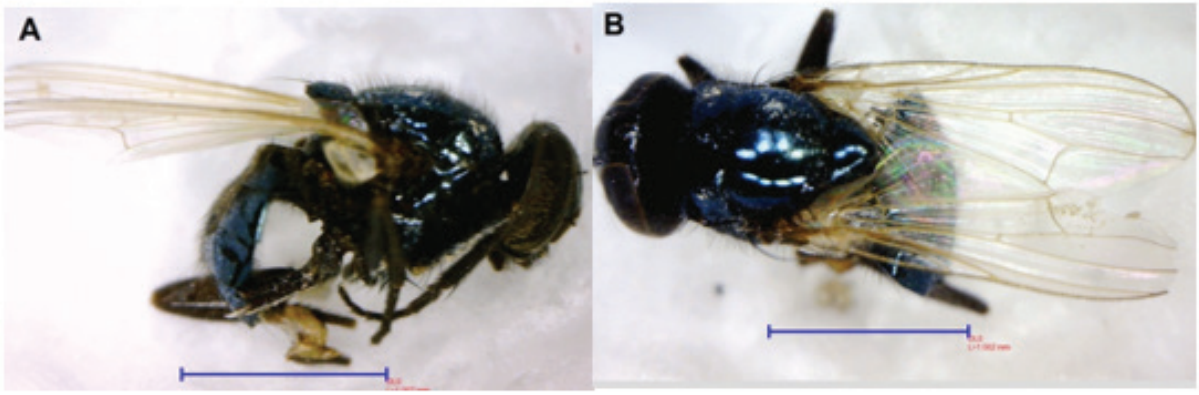


**Plate (1):** *Hydrotaea aenescens*; **(A) Male, lateral view**

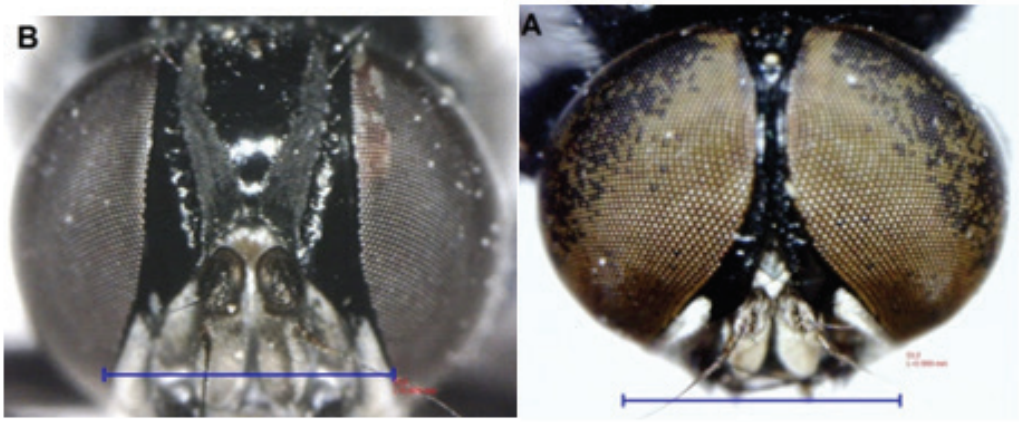


**Plate** (2): head of *H. albuquerquei*; (A) Male (B) female

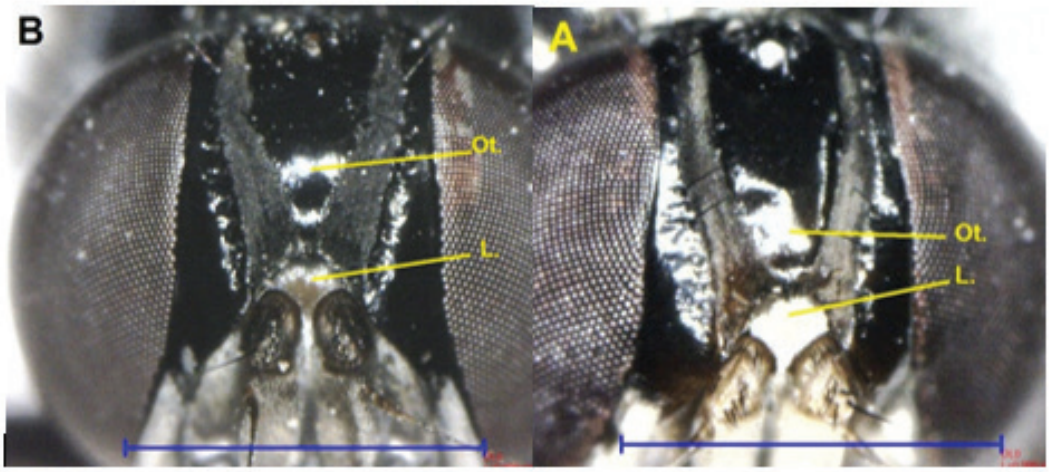


**Plate** (3): head of female; (A) *H. aenescens*; (B) *H. albuquerquei*

**L. =lunule; Ot. = Ocellar triangle**

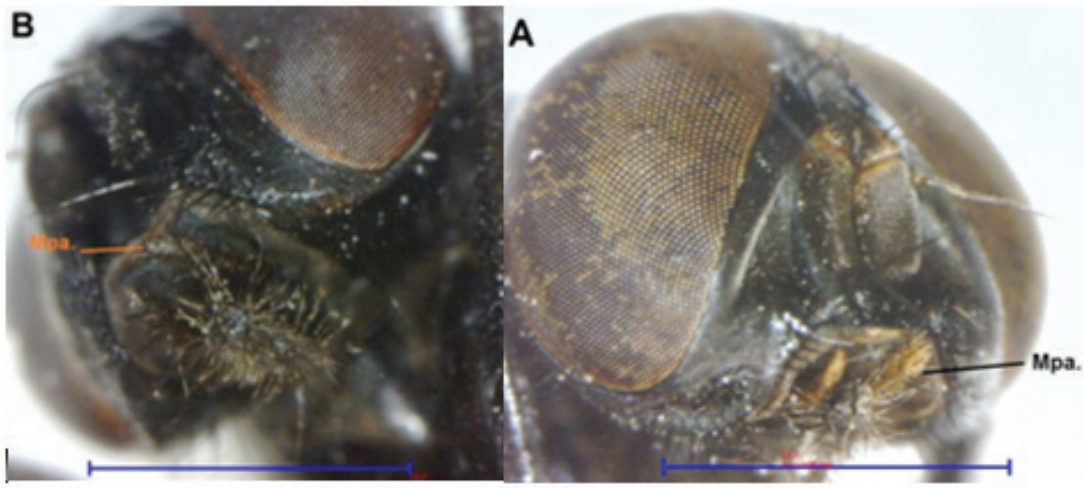


**Plate** (4): head of male; (A) *H. aenescens*; (B) *H. albuquerquei*

Mpa. = maxillary palp

**Plate (5): hind leg of** *H. aenescens* **T. = tuft, lateral view,**

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest**: Non

**Funding**: Self-funding

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# Effect of Aerobic Training on Selected Cardiopulmonary Parameters in Myocardial Infarction Patients with Stroke

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## Abstract

**Background:** Patients in cardiac rehabilitation are typically advised to complete a period of maintenance phase. **The purpose** of this study was to determine if there was any difference in effect of aerobic training on selected cardiopulmonary parameters in myocardial infarction patients with stroke. **Methodology:** Forty patients of both sexes with age 40-50 years with chronic myocardial infarction patients with stroke after 6 months participated in the study. Patient's were assigned for 4 weeks into two groups: group (A) received aerobic training and traditional physical therapy program and group (B) which received traditional physical therapy program. Patients were assessed pre and post treatment using through Stress exercise test unit (Modified Bruce protocol) and modified ashwarth scale. **Results:** This study revealed that there is significantly improved in resting heart rate (10.10%), maximum heart rate (4.67%), METs (64.95%), maximum systolic blood pressure (4.45%), maximum diastolic blood pressure (9.45%) and VO2 max (35.36%) variables in group (A) treated by aerobic training than those of traditional physical therapy program only. **Conclusion:** Aerobic training was a valuable method for management myocardial infarction patients with stroke.

***Key Words:*** *Myocardial Infarction, Stroke, Aerobic Training, Cardiopulmonary Parameter)*

## Introduction

Myocardial Infarction is defined by **Borja Ibanez et al,**[(1)] as myocardial cell necrosis due to significant and sustained ischaemia. It is an acute manifestation of atherosclerosis-related coronary heart disease. Myocardial Infarction results from either coronary heart disease, which implies obstruction to blood flow due to plaques in the coronary arteries or, much less frequently, to other obstructing mechanisms.

Individuals after stroke generally have low endurance for exercise as a secondary consequence of immobility. The VO2max values are 25–45% lower than in age-matched, healthy patients. This early and persistent decline in aerobic capacity can delay or inhibit participation in a therapeutic exercise program, complicate the rehabilitation process and long-term post-stroke course of care, and limit the ability of the individual to perform functional activities independently. [(2)].

A cardiopulmonary exercise test compares the coronary circulation during physical exertion, showing any abnormal blood flow to the myocardium (heart muscle tissue). The results can be interpreted as a reflection on the general physical condition of the tested patient. This test is used to diagnose coronary artery disease and used as prediction after a myocardial infarction [(3)].

Aerobic exercise (also known as cardio) is physical exercise of low to high intensity that depends primarily on the aerobic energy-generating process. Aerobic literally means "relating to, involving, or requiring free oxygen", and refers to the use of oxygen to adequately meet energy demands during exercise via aerobic metabolism. Generally, light-to-moderate intensity activities that are sufficiently supported by aerobic metabolism can be performed for extended periods of

time [4].

## Material and Method

Patient Selection

Forty patients of both sexes (31 men and 9 women) with age 40-50 years was participated in the study, the study was delimited to chronic myocardial infarction patients with stroke after 6 months. They were selected from Physical Therapy Center, Modern University for Technology and Information.

**Inclusion Criteria**

Patients who demonstrate a mild spasticity according to Modified Ashwarth scale and Patients able to walk independently.

**Exclusion Criteria**

Patients having contraindication for stress test, Musculoskeletal or neurological disease that may affect walking, patients who didn't follow instructions (Aphasia, blindness and deafness) and Patients who had marked sensory loss.

Group (A): consist of twenty stroke patients (16 men and 4 women) received aerobic exercise (treadmill training) and traditional physical therapy program.

Group (B): consist of twenty stroke patients (15 men and 5 women) received traditional physical therapy program.

Instrumentation:

Instrumentation:

Assessment equipment

**Stress exercise test unit.**

QUARK_CPET, COSMED with 12 channels ECG to measure resting heart rate, maximum heart rate, METs, maximum systolic and diastolic blood pressure and VO2 max.

## Methodology

Steps of evaluation carried at baseline of the study for both groups and re-assumed after 4 weeks of training.

**I) Evaluation procedure**

Stress test

Patient instructed not to eat at least 2 to 3 hours before the test. Patient was asked about the drug being taken, and potential electrolyte level abnormalities. A 12-lead ECG was applied in standing position. Careful explanations of the test; the testing procedure. The optimal exercise protocol **(**Modified Bruce protocol) last 10 minutes and will be adjusted to the patients. Begin exercise test, monitoring the 12 lead ECG, vital signs, oxygen saturation, and symptoms throughout the test. At regular intervals, asking patients how about Chest or arm discomfort, Short of breath, Dizzy, Lightheaded or Any other unusual symptoms. When the test starts there is half minute before the treadmill start then the phase of warming up for 2 minutes with speed 1.4 mph and 0 in inclination then exercise phase for 8 minutes with speed 2 mph and 0 inclination and final cooling down for 2 minutes with speed 1.4 mph and 0 inclination. After the test end wait until symptoms and/or ECG and vital signs returns to baseline.

**Modified Ashwarth scale (MAS):**

The MAS was done in supine position. Because spasticity is "velocity dependent", the MAS were done moving the limb at the "speed of gravity." The test was done for the maximum of three times for each joint. If it is done more than three times the short-term effect of a stretch impacts the score;

II) Treatment Procedure:

**A) Group A:**

Patients received 4 weeks of aerobic training and traditional physical therapy, three times per week for 45 minutes per session.

Patients obtained aerobic training (treadmill training) through speed range from 0.6 to 1.3KM/H, 0°incline and no resistance.

Traditional exercise program for both groups:

Relaxation technique for spastic muscles, Facilitatory technique for antispastic muscles, stretching exercise to prevent shortening, Proprioceptive Neuromuscular Facilitation (PNF) and Trunk control training.

B) Group B:

Patients received the same traditional physical therapy training for 4 weeks as in group A.

## Results

**Data collection**

Normality test of data using Shapiro-Wilk test was used, that reflect the data was normally distributed after removal outliers that detected by box and whiskers plots. Additionally, testing for the homogeneity of variance revealed that there was no significant difference (P>0.05). All these findings allowed the researchers to conducted parametric and non-parametric analysis. Therefore, in the current study the data is parametric and normally distributed.

**1. Demographic data**

The mean values of age in group A and group B were 45.11 ±3.03 and 45.10 ±3.77year, respectively. The mean values of weight in group A and group B were 82.20 ±6.90 and 81.33 ±7.005kg, respectively. The mean values of height in group A and group B were 169.64 ±3.58 and 169.43 ±4.48cm, respectively. The mean values of BMI in group A and group B were 28.56 ±2.97 and 28.33 ±1.94kg/m$^2$, respectively. The statistical analysis by independent t-test revealed that no significant differences (P>0.05) in values of general demographic data (age, weight, height, and BMI) between both groups.

**2. Rest HR (BPM)** Table (1)

Within each group, the statistical analysis by paired t-test revealed there were significantly decreased of rest HR (BPM) at post treatment compared to pre-treatment within group A (P=0.0001; P<0.05) and group B (P=0.0001; P<0.05). Between both groups, the statistical analysis by independent t-test revealed that there were no significant difference in pre-rest HR (P=0.479; P>0.05) while, a significant difference in post-rest HR (P=0.0001; P<0.05) between both groups.

**Table (1): Comparison between mean values of pre- and post-rest HR (BPM) within each group and between both groups.**

| Items | Rest HR (BPM) | |
|---|---|---|
| | Group A | Group B |
| Pre-treatment (Mean ±SD) | 76.92 ±7.21 | 78.22 ±3.65 |
| Post-treatment (Mean ±SD) | 69.15 ±4.61 | 74.21 ±0.64 |
| Mean difference | 7.77 | 4.01 |
| Improvement % | 10.10% | 5.13% |
| t-value | 6.036 | 4.666 |
| P-value (P<0.05) | 0.0001 | 0.0001 |
| Significance | S | S |
| | Pre-treatment (Mean ±SD) | Post-treatment (Mean ±SD) |
| Mean difference | 1.30 | 5.06 |
| t-value | 0.715 | 6.524 |
| P-value (P<0.05) | 0.479 | 0.0001 |
| Significance | NS | S |

SD: standard deviation P-value: probability value NS: non-significant.

SD: standard deviation %: percentage P-value: probability S: significant

**3. Max HR (BPM)** Table (2)

Within each group, the statistical analysis by paired t-test revealed there were significantly decreased of Max HR (BPM) at post treatment compared to pre-treatment within group A (P=0.0001; P<0.05) and group B (P=0.011; P<0.05). Between both groups, the statistical analysis by independent t-test revealed that there were no significant difference in pre-Max HR (P=0.458; P>0.05) while, a significant difference in post-Max HR (P=0.041; P<0.05) between both groups.

**Table (2): Comparison between mean values of pre- and post-Max HR (BPM) within each group and between both groups.**

| Items | Max HR (BPM) | |
|---|---|---|
| | Group A | Group B |
| Pre-treatment (Mean ±SD) | 134.42 ±6.21 | 135.47 ±1.08 |
| Post-treatment (Mean ±SD) | 128.13 ±10.13 | 132.78 ±2.11 |
| Mean difference | 6.29 | 2.69 |
| Improvement % | 4.67% | 1.99% |
| t-value | 6.829 | 3.947 |
| P-value (P<0.05) | 0.0001 | 0.011 |
| Significance | S | S |
| | Pre-treatment (Mean ±SD) | Post-treatment (Mean ±SD) |
| Mean difference | 1.05 | 4.65 |
| t-value | 0.749 | 2.457 |
| P-value (P<0.05) | 0.458 | 0.041 |
| Significance | NS | S |

**4. METs (ml $O_2$/kg/min)** Table (3)

Within each group, the statistical analysis by paired t-test revealed there were significantly increased of METs at post treatment compared to pre-treatment within group A (P=0.002; P<0.05) and group B (P=0.0001; P<0.05). Between both groups, the statistical analysis by independent t-test revealed that there were no significant difference in pre-METs (P=0.127; P>0.05) while, a significant difference in post-METs (P=0.001; P<0.05) between both groups.

**Table (3): Comparison between mean values of pre- and post-METs (ml $O_2$/kg/min) within each group and between both groups.**

| Items | METs (ml O2/kg/min) | |
|---|---|---|
| | Group A | Group B |
| Pre-treatment (Mean ±SD) | 1.87 ±0.2 | 1.94 ±0.8 |
| Post-treatment (Mean ±SD) | 2.74 ±0.7 | 3.20 ±0.5 |
| Mean difference | 0.87 | 1.26 |
| Improvement % | 64.95% | 46.52% |
| t-value | 4.568 | 7.257 |
| P-value (P<0.05) | 0.002 | 0.0001 |
| Significance | S | S |
| | Pre-treatment (Mean ±SD) | Post-treatment (Mean ±SD) |
| Mean difference | 0.07 | 0.46 |
| t-value | 1.568 | 14.740 |
| P-value (P<0.05) | 0.127 | 0.001 |
| Significance | NS | S |

**5. Max SBP (mm Hg)** Table (4)

Within each group, the statistical analysis by paired t-test revealed there were significantly decreased of Max SBP at post treatment compared to pre-treatment within group A (P=0.0001; P<0.05) and group B (P=0.039; P<0.05). Between both groups, the statistical analysis by independent t-test revealed that there were no significant difference in pre-Max SBP (P=0.878; P>0.05) while, a significant difference in post-Max SBP (P=0.006; P<0.05) between both groups.

**Table (4): Comparison between mean values of pre- and post-Max SBP (mm Hg)within each group and between both groups.**

| **Items** | **Max SBP (mm Hg)** | |
|---|---|---|
| | **Group A** | **Group B** |
| Pre-treatment (Mean ±SD) | 136.00 ±0.51 | 135.00 ±10.95 |
| Post-treatment (Mean ±SD) | 129.95 ±0.64 | 131.96 ±5.88 |
| Mean difference | 6.05 | 3.04 |
| Improvement % | 4.45% | 2.25% |
| t-value | 5.047 | 2.177 |
| P-value (P<0.05) | 0.0001 | 0.039 |

***Cont...*** **Table (4): Comparison between mean values of pre- and post-Max SBP (mm Hg)within each group and between both groups.**

| | | |
|---|---|---|
| Significance | S | S |
| | Pre-treatment (Mean ±SD) | Post-treatment (Mean ±SD) |
| Mean difference | 1.00 | 2.01 |
| t-value | 0.878 | 3.764 |
| P-value (P<0.05) | 0.359 | 0.006 |
| Significance | NS | S |

**6. Max DBP (mm Hg)** Table (5)

Within each group, the statistical analysis by paired t-test revealed there were significantly decreased of Max DBP at post treatment compared to pre-treatment within group A (P=0.0001; P<0.05) and group B (P=0.006; P<0.05). Between both groups, the statistical analysis by independent t-test revealed that there were no significant difference in pre-Max DBP (P=0.764; P>0.05) while, a significant difference in post-Max DBP (P=0.012; P<0.05) between both groups.

**Table (5): Comparison between mean values of pre- and post-Max DBP (mm Hg) within each group and between both groups.**

| **Items** | **Max DBP (mm Hg)** | |
|---|---|---|
| | **Group A** | **Group B** |
| Pre-treatment (Mean ±SD) | 85.01 ±13.20 | 85.99 ±5.83 |
| Post-treatment (Mean ±SD) | 76.98 ±10.99 | 80.00 ±9.40 |
| Mean difference | 8.03 | 5.99 |
| Improvement % | 9.45% | 6.97% |
| t-value | 10.816 | 3.078 |
| P-value (P<0.05) | 0.0001 | 0.006 |
| Significance | S | S |
| | Pre-treatment (Mean ±SD) | Post-treatment (Mean ±SD) |
| Mean difference | 0.98 | 3.02 |
| t-value | 0.302 | 2.478 |
| P-value (P<0.05) | 0.764 | 0.012 |
| Significance | NS | S |

**7. $VO_2$ Max (ml/kg/min)** Table (6)

Within each group, the statistical analysis by paired t-test revealed there were significantly increased of $VO_2$ at post treatment compared to pre-treatment within group A (P=0.0001; P<0.05) and group B (P=0.008; P<0.05). Between both groups, the statistical analysis by independent t-test revealed that there were no significant difference in pre-$VO_2$ (P=0.478; P>0.05) while, a significant difference in post-$VO_2$ (P=0.018; P<0.05) between both groups.

**Table (6): Comparison between mean values of pre- and post-$VO_2$ Max (ml/kg/min) within each group and between both groups.**

| Items | VO2 Max (ml/kg/min) | |
|---|---|---|
| | Group A | Group B |
| Pre-treatment (Mean ±SD) | 31.02 ±2.78 | 31.99 ±5.46 |
| Post-treatment (Mean ±SD) | 41.99 ±6.58 | 37.00 ±11.42 |
| Mean difference | 10.97 | 5.01 |
| Improvement % | 35.36% | 15.66% |
| t-value | 7.887 | 2.977 |
| P-value (P<0.05) | 0.0001 | 0.008 |
| Significance | S | S |
| | Pre-treatment (Mean ±SD) | Post-treatment (Mean ±SD) |
| Mean difference | 0.97 | 4.99 |
| t-value | 0.717 | 2.355 |
| P-value (P<0.05) | 0.478 | 0.018 |
| Significance | NS | S |

**Ethical Clearance:** Approval of the ethical committee of the faculty of physical therapy of Cairo University (No:P.T.REC/012/002148), written consent prior participation and confidentiality was assured.

**Source of Funding:** Self

**Conflict of Interest:** Nil

## Discussion

The main aim of this study was to determine if there was any difference in effect of aerobic training on selected cardiopulmonary parameters in myocardial infarction patients with stroke.

Patients in cardiac rehabilitation are typically advised to complete a period of supervised aerobic training, in the current study there was significant difference in systolic and diastolic blood pressure in addition to heart rate with privilege to group A whom received aerobic exercise training.

This was explained by **Kjeldsen et al [5],** who proved that SBP and DBP rise during exercise provides information about the hemodynamic response to increasing physical stress. Dynamic exercise produces

a large increase in SBP and DBP. The highest cardiovascular disease mortality rate was observed in men with both elevated resting and exercise blood pressure. They reported that SBP and DBP at moderate and peak workloads was directly associated with the risk of cardiovascular events in hypertensive men with an increased risk of any stroke.

Both SBP and DBP changed to levels that were statistically significant when comparing both groups after the program, although changes in both groups separately were not significant. Percent of change in SBP was (4.2 % ↓ and 2.1% ↑) and DBP was (2.6% ↓ and 2.3% ↑) for study and control groups respectively. Improvement of study group and deterioration of control group showed the positive effect of Cardiac Rehabilitation program [(6)].

In the current study there was significant improvement in METs with aerobic training which was approved by **Swain and Franklin [(7)]**, they demonstrated on their study improvements were 1.41 METs (39% improvement), 1.01 METs (15% improvement), and 0.80 MET (8.6% improvement) for the low, moderate, and high cardiorespiratory fitness patients (at baseline), respectively. The greatest improvements occurred in those patients who were most likely to benefit most from an aerobic training intervention, that is, those in the lowest cardiorespiratory fitness, high-risk cohort.

The present study showed significant improvement $VO_2$ max outcome after aerobic training, the result goes with a study in individuals starting exercise within 6 days to 6 months after stroke onset, revealed a large effect size. This finding supports the evidence that individuals in the sub-acute stage after stroke have high potential to increase $VO_2$peak following a cardiovascular training intervention. This is in addition to a spontaneous recovery of peak aerobic capacity of 16.9% that occurs during the first 6 months after stroke. But given the fact that $VO_2$peak is reduced within 0–30 days after stroke, and 10 ml/kg/min is required for light activities of daily living (ADL), this small improvement of peak aerobic capacity could lead to a large functional carryover [(8)].

## Conclusion

The results of this study revealed better improvement of aerobic exercise more than those of traditional physical therapy program alone. Aerobic exercise could be considered a valuable method for improvement of cardiopulmonary parameters on myocardial infarction patients with stroke.

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# Effects of Perceived Health Condition, Gerotranscendence, and Wisdom on Successful Aging of Elders

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## Abstract

**Background/Objectives**: The purpose of this study was to analyse the effect that perceived health condition, gerotranscendence, and wisdom have on successful aging in elders. **Methods/Statistical analysis**: This study is a descriptive survey design using a convenience sampling. The subjects of this study were 94 elders between 65 years old or above. The data were analyzed using descriptive statistics, t-test, ANOVA, Pearson's correlation coefficient and multiple regression using the SPSS Win 23.0 program. **Findings**: Successful aging of subjects had positive correlation with perceived health condition, gerotranscendence and wisdom. As a result of conducting the stepwise regression analysis, the explanatory power of above 2 variables was appeared to be 57.8% including wisdom (β=.713, p<.001) and monthly household income (β =.153, p=.032).

**Improvements/Applications**: As a plan to achieve the successful aging of the elders through the results of this study, the government and local governments need to develop a nursing arbitration program for elders to have wise lives in their daily lives and to make efforts to institutionalize the customized job creation considering the ages and conditions of the elders so that they can raise monthly household incomes.

***Keywords**: Elderly, Successful aging, Perceived health condition, Gerotranscendence, Wisdom*

## Introduction

According to the extension of the old age along with the growing number of elders, The problems of elders appear in various forms, such as physical change, economic instability, loss of social role, and psychological maladjustment, raising interests in solving these problems. Many elders evaluate that they lived a life without regret when looking back on their own in their old age and hope that they look forward to providing hope and consideration even in the present lives. The life of these elders can be called successful aging. Considering the meaning from various scholars, successful aging means living a psychologically comfortable and happy life by being in good physical health, maintaining a high level of cognitive abilities, being economically stable, exchanging positive interactions with family and people around, and actively engaging in social activities[1]. Therefore, health care professionals, including nurses, should provide physical, mental, and social care to ensure successful aging for the rest of elders' lives.

For this nursing intervention, it is necessary to preferentially clarify the variables related to successful aging. Based on an analysis of previous studies, the variables of the perceived health condition, gerotranscendence, and wisdom can be considered as mainly related to the physical, psychological, social, and cognitive factors of the elders. First of all, the physical health of the elders aged 65 or older generally has one or more physical illnesses, but the subjective way they judge by themselves is more relevant to the daily lives of elders at the level of physical function than the medical objective way, and it is more appropriate to measure successful aging measuring the health conditions that the elders themselves perceive subjectively[2], so this study includes the health conditions that the elders perceive subjectively. On the psychological side, there is also a phenomenon in which the elders try to overcome their physical and mental abilities and

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realities that degenerate in the latter half of their old ages and develop into a new dimension beyond time and space. Elders who have reached this gerotranscendence recognize that aging is part of the process of normal human growth and development and naturally accepts changes in physical, psychological, and social aging[3]. According to Yang[4]'s study with the subjects of 185 elders, the most influencing variable for successful aging was self-transcendence, and the higher the degree of self-transcendence, the higher the degree of successful aging, so it can be said that gerotranscendence is related to successful aging.

In addition, as wisdom is a mature mental activity that solves the various problems of life through the balanced integration of cognitive, emotional, mental, moral, and relational factors[5], wisdom means cognitively experienced eye, high insight, excellent judgment, and harmonizes with the balanced integration of the personal inner self. Therefore, the wisdom of the elders can be inferred that it plays an important role in a successful life. The previous study of elders in North Jeolla Province also showed that the wisdom of life has a mediated effect on successful aging[6].

Therefore, in this study, I would like to syntagmatically utilize the variables of perceived health conditions, gerotranscendence, and wisdom for elders living in the community to identify the relationship with successful aging, and grasp the effect of these variables on successful aging to use it as basic data for nursing intervention for the successful aging of the elders.

## Method

### 1. Subjects

The subjects of the study are elders aged 65 or older who visit five health clinics located in D city, who have understood the purpose of the study and voluntarily expressed their willingness to participate with the written consent. People who are not diagnosed with dementia or who are with mild dementia, who can communicate and do not have a mental illness. To verify the fitness of the sample size, the G*Power 3.0 program was used and a significance level of .05, effect size of .15, verification power of .80 and 5 predictive factors were applied to the regression analysis to acquire the final number of 92 subjects. A total of 94 copies were used in the final analysis.

### 2. Instruments

#### 2.1. Perceived health condition

The tool developed by Speak, Cowart & Peller[7] and used by Kim[8] was used. With a total of three questions, the higher the score on a five-point scale from 1 "very bad" to 5 "very good," the higher the perception of health conditions. Cronbach's α=.85 at the time of the development and .78 in this study.

#### 2.2. Gerotranscendence

Nine questions concerning Transcendence, a sub-area, of the Successful Aging Inventory-Korean, which was designed by Troutman et al. and whose reliability and validity was verified by Kim[9]'s translation, were used. It is a four-point Likert scale from 1 "Strongly Disagree" to 4 "Strongly Agree" and the higher the respondents' scores, the higher the degree of gerotranscendence they feel. Cronbach's α=.71 in Kim[9]'s study and 70 in this study.

#### 2.3. Wisdom

Korean Wisdom Scale (KMWS) developed by Kim[10] was used. A total of 43 questions consist of four sub-areas. The higher the score, the higher the degree of wisdom, with the five-point scale from 1 "Strongly Disagree" to 5 "Strongly Agree". Cronbach's α=.93 of reliability at the time of the development and .97 in this study.

#### 2.4. Successful aging

The successful aging tool of Korean elders developed by Kim[11] was used. This tool consists of 31 questions. The higher the score, the higher the degree of successful aging, on a scale from 1 "Strongly Disagree" to 5 "Strongly Agree". Cronbach's α=.92 in Kim[11]'s study and .95 in this study.

### 3. Data collection

The data collection period was from April 20 to May 20, 2020. The researcher explained the purpose and method of the research to the heads of five health clinics located in D city and obtained permission for the same data collections after two meetings with the heads

of health clinics with the researcher. The heads of health clinics were required to read and respond directly to elders who visited the health clinics. It took about 20 minutes to complete the questionnaire.

### 4. Ethical consideration

The researcher explained in advance that the subject would not have to respond if they were reluctant to reveal personal information. The researcher explained that subjects can stop or withdraw the answering at any time if they do not want to participate in the study. It was approved by the K University's Institutional Review Board for the data collection of this study(KNU-IRB-2020-12). During the study period the guidelines on ethical studies were observed.

### 5. Data analysis

Using the SPSS/WIN 23.0 program, the subjects' general characteristics and variables were analyzed for frequency, percentage, mean, and standard deviation. The difference in successful aging according to general characteristics was analyzed using t-test, ANOVA and Scheffé test. 각 The correlation between each variable was Pearson's correlation coeffects, and the influence factors of successful aging were analyzed using stepwise multiple regression.

## Result And Discussion

### 1. General characteristics of subjects

The average age of subjects was 74.81 years old. The elderly aged 70-79 accounted for 42(44.7%) of the population. 51(54.3%) of the subjects said that they do not have religion, and as for the state of marriage, marriage is 63(67.0%), and majority. 71(75.5%) were living with more than one family. Most of the subjects (70, 74.5%) thought that monthly allowance was more than normal degree, and 67(72.3%) earned less than 1.5 million won per month. 56(59.6%) of the subjects graduated from elementary school and 51(54.3%) of the subjects had more than two diseases. 57(60.6%) answered that they were exercising. As for friendship with friends, most of 86 (91.5%) answered that they are connected[Table 1].

**Table 1. General Characteristics and Difference of Successful aging according to Characteristics (N=94)**

| Characteristics | Categories | n(%) | Successful aging | |
|---|---|---|---|---|
| | | | M±SD | t/F (P) |
| Age (years) | 65-69 | 25(26.6) | 3.76±0.64 | 1.90 (.155) |
| | 70-79 | 42(44.7) | 3.62±0.53 | |
| | 80+ | 27(28.7) | 3.43±0.66 | |
| Religion | Yes | 43(45.7) | 3.75±0.56 | 2.23 (.028) |
| | No | 51(54.3) | 3.47±0.62 | |
| Marital Status | Living together | 63(67.0) | 3.66±0.56 | 1.01 (.316) |
| | Separation by death, divorce, etc | 31(33.0) | 3.52±0.68 | |
| Family living together | No | 23(24.5) | 3.48±0.67 | -1.09 (.277) |
| | More than one person | 71(75.5) | 3.64±0.58 | |

***Cont...*** **Table 1. General Characteristics and Difference of Successful aging according to Characteristics (N=94)**

| | | | | |
|---|---|---|---|---|
| Ideas of the monthly pocket money | Not enough | 24(25.5) | 3.40±0.62 | -1.91 (.059) |
| | Above normal | 70(74.5) | 3.67±0.59 | |
| Monthly Household Income | Less than 1.51 million won | 67(72.3) | 3.49±0.61 | -3.03 (.005) |
| | More than 1.51 million won | 27(28.7) | 3.90±0.51 | |
| Academic Background | Graduated from elementary school or below | 56(59.6) | 3.50±0.64 | -2.10 (.039) |
| | Middle school dropout or higher | 38(40.4) | 3.76±0.52 | |
| The number of diseases | Less than one | 43(45.7) | 3.67±0.61 | 0.83 (,409) |
| | Two or more | 51(54.3) | 3.55±0.61 | |
| Exercise | Do | 37(39.4) | 3.48±0.69 | -1.32 (.102) |
| | Don't do | 57(60.6) | 3.65±0.53 | |
| Having a friend ship | Have | 8(8.51) | 3.32±0.61 | -1.36 (.176) |
| | Don't have | 86(91.5) | 3.63±0.61 | |

**2. Descriptive statistics of the variables**

The mean of subjects' perceived health condition was 2.96±0.75, 2.60±0.57 for gerotranscendence, 3.29± 0.57 for wisdom, and 3.60±0.61 for successful aging[Table 2].

**Table 2. Descriptive Statistics of the Variables**

| **Variables** | **M±SD** | **Min** | **Max** |
|---|---|---|---|
| Perceived health condition | 2.96±0.75 | 1.00 | 5.00 |
| Gerotranscendence | 2.60±0.57 | 1.44 | 6.11 |
| Wisdom | 3.29±0.57 | 1.93 | 4.53 |
| Successful aging | 3.60±0.61 | 1.94 | 4.81 |

**3. Difference of successful aging according to general characteristics**

The difference of successful aging according to general characteristics showed significant difference according to religion (t=2.23, p=.028), monthly household income (t=-3.03, p=.008) and education (t=-2.10, p=.039). In other words, elders with religion, elders with income of more than 1.51 million won, and elders

with the academic background of more than middle school dropouts had a higher level of successful aging awareness[Table 1].

**4. Correlations among the variables**

Successful aging of subjects had positive correlation with perceived health condition (r=.30, p=.003), gerotranscendence (r=.35, p=.001) and wisdom (r =.744, p<.001)[Table 3].

**Table 3. Correlations among the Variables**

| Variables | Perceived health condition r (p) | Gerotrans cendence r (p) | Wisdom r (p) |
|---|---|---|---|
| Successful aging | .30 (.003) | .35 (.001) | .74 (<.001) |

**5. Factors affecting successful aging of subjects**

Successful aging was set as a dependent variable for a multiple regression analysis. The self-correlation coefficient of Durbin-Watson was 2.021, and VIF value was 1.046 which is smaller than 10, indicating that there were no issues of multi-linearity.

The analysis showed that wisdom (β=.718, p<.001), and monthly household income (β=.153, p =.032) (more than 1.51 million won) had a significant effect on successful aging in elders. The regression analysis was statistically significant (F=61.61, p<.001), with the combined explanatory power of wisdom, and monthly income being 57.8%. Among them, the most influential variable was wisdom[Table 4].

**Table 4. Factors affecting successful aging of subjects**

| **Variables** | **B** | **SE** | **β** | **t** | **p** |
|---|---|---|---|---|---|
| Constant | 1.044 | .245 | | 4.256 | <.001 |
| Wisdom | .760 | .075 | .718 | 10.183 | <.001 |
| Monthly household income(more than 1.51 million won) | .206 | .094 | .153 | 2.183 | .032 |
| R2=.578, Adj R2 =.569, F=61.61, p<.001 | | | | | |

Reference category: monthly household income=Less than 1.51 million won

## Discussion

This study sought to provide basic data on nursing intervention development for the successful aging of the elders by identifying the effects of perceived health conditions, gerotranscendence, and wisdom on the successful aging of the elders.

The perceived health conditions of the elders, gerotranscendence, and wisdom had a positive correlation with successful aging, and the factors affecting the successful aging of the elders were wisdom and household monthly income. It showed that these variables explain 57.8 percent of successful aging.

According to a study[12] of 172 elderly people in rural areas, it showed a positive correlation between perceived health conditions and successful aging, and the factors affecting successful aging are similar to this study. The perceived health condition of elders is the overall health condition, including objective health condition and subjective health care needs, which is the recognition of daily activities and health conditions in their lives. Therefore, recognizing that their health is better than the number of diseases can be an important clue for the health of the elders. Therefore, nurses who are primary health workers should create a health-related local environment and provide professional care for the elders' regular health behaviors. In addition, a study of 185 elderly women[4] found that self-transcendence had a net correlation with successful aging and was the most influential variable in successful aging. And a study of 174 elderly women[13] showed a strong net correlation between self-transcendence and successful aging. In addition, 152 Korean elderly men[14] found that wisdom has a mediating effect in the relationship between self-esteem and successful aging, and also in the study of 513 elderly Koreans living in the community[15], there is a net correlation between wisdom and successful aging and the wisdom was found to be an influencing factor for successful aging, which was consistent with the result of this study. If both men and women have gerotranscendence in their old age, I believe that they will be able to achieve successful aging by showing a positive attitude toward life because they can maintain the meaning and purpose of life, be interested in

contributing to the next generation, and control and manage themselves[16] out of everyday life. Moreover, elders who have reached the gerotranscendence tend to accept physical, psychological, and social aging naturally, thinking that aging is part of the process of human growth and development[3]. Also, a wise person tends to accept the positive and negative aspects of reality and be satisfied with his or her own life, so he or she can lead a successful life in old age. Yang[4]'s study is similar to this study because the amount of monthly spending money for the elders was a factor affecting successful aging. As the economic condition is a major variable in managing the lives of the elders, the support is needed to ensure that the elders do not suffer from economic problems. I hope that there will be more opportunities for elders to get financial helps through works, considering their own levels of health. Economic welfares such as job creation through the invigoration of exchanges with social enterprises and local businesses are required.

## Conclusion

According to the above results, As wisdom enables integrated and overall access to life's challenges and problems, they can achieve successful aging if they support their wise lives. And the economic aspect has also proved to be a major factor of successful aging. Therefore, nurses need to interact with agencies concerned to provide policy-level and institutional support by developing and applying nursing intervention considering these factors.

This study is meaningful in that it is an integrated approach that considered physical, mental, and cognitive variables for the successful aging of the elders.

**Ethical Clearance:** Not required

**Source of Funding:** Nil

**Conflict of Interest:** Nil

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# Association of Terminal Complement Complex (TCC), Prostaglandin (PGj2) among Patient with First Episode Psychosis (Case-Control Study)

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## Abstract

The purpose of the study investigate the association between some inflammatory biomarkers with first episode psychosis (FEP) and to find out the correlation with different socio demographic profile. A case-control study was involve patients with first episode psychosis and healthy control. peripheral Blood samples collected from 44 cases they were attending AL-Hakeem General hospital, Psychiatric Department, Najaf, Iraq, in the period between January, 2019 to may, 2019. The cases included females and males, and the age was 18-70 years. Control: 44 healthy controls who had no history or clinical evidence of first episode psychosis or any other disease. The result revealed that increase in the level of serum Complement Complex C5b-9 and decrease Prostaglandin J-2 among FEP patients (1021.7±58.5 and 3.82±0.36) respectively in comparison to control were mean (585.87±47.059 and 9.94±0.67). The results of this research concluded that, the inflammatory response is an immune system that allow the individual to cope with various menacing advise, but in long-lasting conditions and pathological, the continuous of this stimulate could develop into harmful. The regulation of the all development involves endogenous counter-balancing mechanisms that control special effects of deleterious pro inflammatory mediators. information showing a misbalance in some pro inflammatory/anti inflammatory in blood of person with FEP.

***Keywords****: first episode psychosis, serum Complement Complex C5b-9, Prostaglandin J 2. Psychosis.*

## Introduction

The word first episode psychosis (FEP) is applied to describe conditions that impact the mind, in which people have problems distinguishing between what is true and what is not. When this occurs, it is called a psychotic episode. The pathogenesis and etiology of FEP is understood, although the facts suggests a contribution from both genetic factors and environmental.[1]

The complement system is a essential part of the innate immune defense, but it is also implicated in the induction of the adaptive immune response and in the removal of dead cells and immune complexes. Also, it helps the ability of phagocytic cells and antibodies to clear pathogens or antigens from an organism. Alters in the level of complement system can be discovered in FEP in compare with healthy. The measurement in serum concentration from both of a selected panel of complement and activation compound with the aim of gaining insight into identifying candidate biomarkers and underlying pathology.[2]

The Prostaglandin 15d-PGJ2 is the newly discovered type of prostaglandin. dehydration product of PGD2, unlike other prostaglandins in numerous respects. 15d-PGJ2 production by no specific prostaglandin synthase (PGS) and no specials 15d-PGJ2 receptor has been well-known to date. In place of, 15d-PGJ2 worked by PGD2 receptors. These characters are accountable for numerous of anti inflammatory functions.[3]

In the deficiency of a biological marker, the diagnosis relies upon clinical assessment. Besides participate to difficulties in early diagnosis, therapeutic choice, disease stratification, (treatment is largely experimental

and prediction of outcome).[4]

The purpose of the study was to examine the role for using complement-related proteins (Terminal complement complex C5B-9) and Prostaglandin J2(PGJ2) as serum biomarkers for FEP. However, the biomarkers could help to explain the pathogenesis of the disease and the present of biomarkers for FEP which would be supportive for diagnosis and might help to know the molecular basis for these conditions, in the outlook studies, to be directly concerned in causing the disease symptoms, they would be very important targets for prevention efforts and rational treatment.[5]

**Methods: Study Design :** Case-control study:

**Patients:** The study population involve patients with first episode psychosis. peripheral Blood samples collected from 44 cases at AL-Hakeem General hospital, Psychiatric Department, in Najaf, Iraq in the period between January, 2019 to May 2019, and the age was 18-70 years.

**Control:** 44 healthy controls who had no history or clinical evidence of first episode psychosis or any other disease.

**Inclusion criteria**: First episode psychotic patients drug naïve.

**Exclusion criteria**: All patients with any acute or chronic diseases and patients with autoimmune disease were excluded from this study in addition excluding pregnant women.

**Informed consent**: Informed consent was obtained from all individual participants included in the study.

**Collection of Sample**

Samples of blood were taken from the individuals enrolled in this study after obtaining the oral consent of them. 5 ml of blood was obtained from cases and controls but, before drawing the blood , had to be cleaned the skin and blood sample were distributed to 2ml of blood to EDTA tube that for (ESR and WBC) and 3ml of blood to plain tube for immunological tests the centrifuge samples at 2 - 8°C 2000-3000 Round Per/Minutes for 15 minutes within 30 minutes.

**Study Parameters**: All suspected patients first episode psychosis and control group subjected to the following immunological tests; Complement complex TCC by ELISA, Prostaglandin J2 by ELISA and Serological Tests Erythrocyte Sedimentation Rate (ESR)**,** White Blood Cell Count.

**Statistical Analysis**: The data of present study were articulated as Mean ± Standard Error, the statistical analysis Descriptive statistics, Correlation coefficients, P-value were using Graphpad prism to calculated. The comparison between two groups were analyzed by t-test and the comparison among subdivided. when P-value < 0.05 was statistically a significant relations between 2 categorical variables was explored by cross- tabulation. The statistical significance of such associations was assessed by Chi-square ($\chi 2$) test. An estimate was considered statistically significant if its P value was less than an $\alpha$ level of significance of 0.05.

## Findings

Forty four patients with FEP and forty four healthy control enrolled in the present study, Table (1) shows the mean of ESR to patient (13.7) control (9.6) and WBC count to patient (10209), control (7847).

**Table (1): Mean of Erythrocyte sedimentation rate and white blood cell count in the studied group**

| Hematological tests | Cases | Controls N=44 | Normal range |
|---|---|---|---|
| | Mean± SE | | |
| ESR | 13.7 | 9.6 | (5-20) |
| WBC | 10209 | 7847 | (4000-7000) |

The result of table (2) revealed that increase in the level of serum Complement Complex C5b-9 and decrease PGJ-2 among FEP patients (1021.7±58.5 and 3.82±0.36) respectively in comparison to control were mean (585.87±47.059 and 9.94±0.67) respectively. Moreover there was a significant differences (P<0.05) among cases & control in regard to concentration of C5b-9, and in serum PGJ-2 levels in patients with FEP in comparison with healthy group.

**Table(2) Distribution of C5b-9 and PGJ2 in the Studied Groups.**

| Biomarkers | FEP N=44 | Controls N=44 | P value |
|---|---|---|---|
| | Mean± SE | | |
| C5b9 | 1021.7±58.5 | 585.87±47.059 | 0.00106 |
| PGJ2 | 3.82±0.36 | 9.94±0.67 | 0.000119 |

**Comparison serum biomarkers levels according to gender in patients .**

Table (3) indicated there is no significant differences (p>0.05) in biomarkers concentration (C5b-9 and PGJ2) among patients with FEP according to gender where the concentration of biomarkers PGJ2 and C5b-9 among male were ( 3.97and 1046.7) respectively in comparison to female were ( Assistant Lecturer, Faculty of Physical Therapy, Modern University for Technology and Information and 1008.3 ) respectively.

**Table (3) Comparison serum biomarkers concentration according to gender in patients.**

| Markers | Mean± S.E. | | p-value |
|---|---|---|---|
| | Male | Female | |
| PGJ2 | 3.97±0.36 | 3.737±0.33 | 0.35 |
| C5B-9 | 1046.7±82.8 | 1008.3±45.45 | 0.25 |

**Comparison serum biomarkers concentration according to Age in patients.**

The results of biomarkers levels (C5b-9 and PGJ2) in FEP patients reflect no significant differences (p>0.05) according to age groups, as shown in table (4). The table also shows a marked decrease in the level or concentration of PGJ2 in comparison to level of the C5b-9.

**Table (4) The mean of serum biomarkers concentration in FEP patients according to age.**

| Markers | Mean± S.E. | | p-value |
|---|---|---|---|
| | (15-29) N=18 | (30-55) N= 26 | |
| PGJ2 | 3.1±0.42 | 4.3±0.24 | 0.31 |
| C5b-9 | 1028.4±71.7 | 1016.3±47.1 | 0.12 |

Estimate the concentration of the biomarkers (C5b-9 and PGJ2) among FEP patients in regards to occupation show statically insignificant ($p > 0.05$), the mean value of C5b-9 and PGJ2 among employed were (3.76 and 1,101.57) in comparison among unemployed (4.15 and 929.3) respectively. Table (5).

**Table (5) Comparison serum biomarkers levels according to occupation in patients.**

| Markers | Mean± S.E. | | p-value |
|---|---|---|---|
| | Employed N=28 | Unemployed N= 16 | |
| PGJ2 | 3.76±0.29 | 4.15±0.51 | 0.31 |
| C5b-9 | 1,101.57±61.83 | 929.3±19.9 | 0.14 |

**Comparison serum biomarkers concentration according to residence in patients**

Distribution of concentration of the biomarkers (C5b-9 and PGJ2) among FEP patients in regards to residence reflect no significant differences ($p > 0.05$) among the mean of the biomarkers in urban and rural as shown in table (6).

**Table (6) Comparison serum biomarkers levels according to residence in patients.**

| Markers | Mean± S.E. | | |
|---|---|---|---|
| | Urban | Rural | p-value |
| PGJ2 | 3.95±030 | 3.68±0.4 | 0.22 |
| C5b-9 | 994.8±54.9 | 1,106.3±165.9 | 0.55 |

The correlation to determine the association between PGJ2 and C5b-9, with first episode psychosis diseases, the figure (1) reflect that, there is a inverse (negative) correlation ($r = -0.249$) between C5b-9 and PGJ2 among FEP patients.

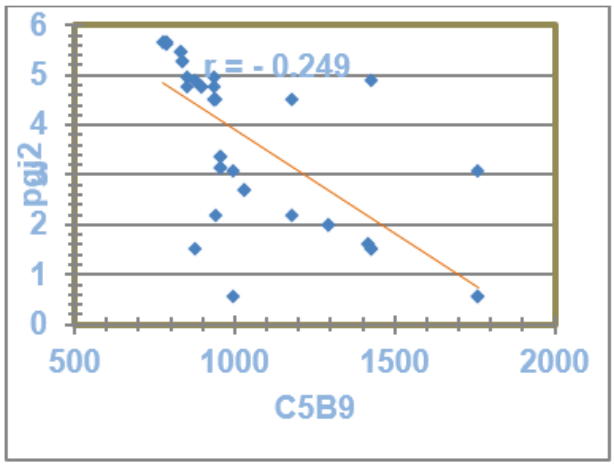


**Fig 1 the graphical presentation of the inverse correlation between C5b-9and PGJ2 in patients with FEP r = - 0.249.**

## Discussion

Distribution of Complement Complex C5b-9 and PGJ-2, in the Studied Groups.

In this study the concentration of the terminal complement complex (C5b-9) was investigated in serum of 44 patients with FEP and 44 healthy controls by using ELISA kit and the results showed that the p-value =0.001. The result of the following studies are similar to and support the result of our study [6,7,8] they said the association between (C5b-9) and disease p value = 0.003.

In this current study the concentration of the PGJ-2 was investigated in serum of 44 patients with FEP and 44 healthy controls by using ELISA kit and the results showed that the decrease in concentration PGJ-2 in patients with FEP compared with the control p-value =0.001. The results of current study are in agreement with results reported by.[9,10]. There is decrease in the concentration of pgj2 biomarker in patients due to the presence of inflammation consumes the natural concentration of marker, but in control ratios were normal.

**Comparison serum biomarkers levels according to gender in patient and control**

The results in this study indicated there is no significant differences ($p > 0.05$) in comparison serum biomarkers concentration (C5b9 p-value = 0.35 ,PGJ-2 p-value = 0.25 ) among patients with FEP according to gender**.** This result agreement with results reported by [11] but find in some study the significant result.[12]

The probable explanations of these findings is that female and male FEP are depending on specific clinical observations, the environmental influences such as smoking, which are more often present in men.

**Comparison serum biomarkers levels according to age in patients and controls.**

The results in this study indicated there is no significant differences ($p > 0.05$) in comparison serum biomarkers concentration (C5b9 p-value = 0.12 ,PGJ-2 p-value = 0.31) in patients with FEP according to age. The result of this study agreement with the study by [13] they reported no significant differences ($p > 0.05$).

In another studies by.[14] Significant differences($p < 0.05$). The effects and pressures of social and psychological impact on all ages, adding to the circumstances of war and death and orphanhood and unemployment and others.

**Comparison serum biomarkers concentration according to occupation in patients.**

The results of this study indicated there is significant differences ($p < 0.05$) in comparison serum biomarkers concentration in patients with FEP according to occupation group**.**

The result of this study supported by previous studies like, [15] while other studies reported statistically no signifcant differences like.[16,17]. The result of the current study reported there is significant differences because the exposure to work problems and may be associated with other socio demographic characters.

**Comparison serum biomarkers concentration according to residence in patient**

The results of this study indicated there is no signifcant differences ($p > 0.05$) in comparison serum biomarkers concentration (C5b-9p-value=0.55,) in patients with FEP according to residence**,** in the previous studies showing similar result. [18,19] while in another studies find signifcant result.[20,21] There is no difference in results because rural life at present is very similar to the advanced life in the city and so they are subject to the same influences.

**Results of the correlation coefficient among biomarkers in patients with FEP**

The result of figure (1) inverse (negative) correlation between C5b-9 andPGJ2 among FEP patients. in the previous studies showing same result. [22,23] The inflammatory response is an immune system that allow the individual to cope with various menacing advise, but in long-lasting conditions and pathological, the preservation of this stimulate could develop into harmful. The regulation of the all development involves endogenous counter-balancing mechanisms that control special effects of deleterious pro inflammatory mediators. Information showing a misbalance in some pro inflammatory/anti inflammatory in blood of person with FES.[24]

## Conclusion

- The inflammation association with symptoms of First Episode Psychosis.
- All age groups are at risk of having an equal incidence of First Episode Psychosis.
- Males and females have the same chance of becoming First Episode Psychosis.
- Biomarkers PGJ2 and C5b9 can be used as diagnostic criteria.

**Conflict of Interest**: there is no conflict of interest.

**Ethical approval:** This study protocol was accepted by the ethical committee, College of Medicine University of Kufa.

**Source of Funding**: Self

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# Perception of Medical Health College Students Toward Mental Health

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## Abstract

**Background:** Mental health is a major that often gets bad perception. Bad perceptions of mental health often occur in special populations (students). It is necessary to measure student perceptions to describe their perceptions regarding mental health

**Objective :** To describe student perceptions (aspects of cognition, aspects of affection and aspects of conation) about mental health.

**Method:** This study uses quantitative method with descriptive approach. The sample of this study are 100 college students of Public health major in UIN Alauddin, Makassar,

**Result:** In general, cognitive aspect of respondents is positive, as well as psychomotoric and affection aspect.

**Conclusion** : Students' perceptions related to mental health after measurement tend to be good for all three aspects (cognition, affection and conation) without one statement having the largest negative percentage.

***Keywords:*** *mental health, medical students, cognition, affection, conation*

## Introduction

Mental health problems are one of the public health problems that must get more attention. The number of patients with mental health problems keeps increasing which is estimated at 450 million people worldwide (World Health Organization, 2013). In Indonesia, mental health problems also become a serious case, because there is a significant increase in number of mental health problem patients from 2 cases per mile in 2013 to 7 cases per mile in 2018. Mental health sufferers often get poor treatment. People who suffer from mental disorders often get negative and bad views and are often seen as frightening [1].

Negative perceptions of mental health not only arise in common people who have minimal knowledge related to mental health, but also arise in certain group, such as medical employees and students who incidentally have better knowledge about medic. Sometimes, students of public health also have negative and mistaken perceptions of mental health. Happell *et al* on their study state that there are still many first-year students who still have unfavorable perceptions of mental health and result in their lack of attention to mental health that they may experience bias in college [2].

Medical students must have a positive perception of mental health because this will affect the future of mental health services. Students who are currently conducting lectures will become health professionals in the future who are professional and have high integrity.

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When students, especially in the field of health, have improved their perceptions and have positive perceptions related to mental health, it is hoped that when they have completed their education they can become good health workers, especially in patients experiencing mental health problems [3].

Medical students must have a good perception of mental health. Moreover, students also must be able to prevent the emergence of mental health problems in the community. However, if it does not have a good perception it can affect the intervention process that occurs. To avoid this, it is necessary to conduct research related to public health students' perceptions to determine student perceptions related to mental health. Based on this, the purpose of this study is to identify perceptions about mental health in public health students.

## Method of the Study

This study uses quantitative design with the descriptive technique for approaching the issue. This study was conducted in June - July 2018 at the Faculty of Medicine and Health Sciences, Alauddin State Islamic University, Makassar. Populations of this study are all students of the public health study program at Alauddin State Islamic University Makassar. This study uses Proportional Random Sampling Technique. Sample are selected using inclusion criteria, namely (1) Health faculty students of 2017; (2) was in the location when the research took place; (3) willing to be a research respondent. Selected sample respondents are 100 people, consisting of 25 people from classes A and C, 24 people from class B, and 26 people from class D [4].

Data collection was carried out directly by conducting interviews with respondents using instruments that had been prepared. Data collection was carried out for 2 months, starting from June 1, 2018 until July 30, 2018. Variable characteristics of respondents are collected included age, gender, type of residence of the respondent. Socio demographic variables are collected using a questionnaire independently, created by the researcher. Nurse perception variables based on aspects of cognition are measured using a questionnaire prepared by researchers. The questionnaire to measure this consists of 10 question items [5].

This questionnaire is rated on a Likert scale, which are Strongly Agree, Agree, Disagree and Strongly Disagree. The data of reliability test results of the questionnaire of cognitive are analyzed using Cronbach Alpha. The reliability result shows the number of 0.810, means that the questionnaire is reliable enough to be used for research instrument. Nurse perception variables based on affection aspects were measured using a questionnaire prepared by researchers. The questionnaire to measure this consisted of 14 question items [6]. The reliability test results of the questionnaire using Cronbach Alpha showed the number 0.81, so it can be said that the questionnaire is reliable for use as a research instrument [7].

Data analysis was carried out univariably, with the aim of describing the characteristics of the variables. Analysis of variables with a numerical data scale is then displayed in the form of mean and standard deviation. The data then are poured in the form of a description, while for each question item is displayed in the form of a percentage [8].

## Result

**Table 1. Distribution of Perception in students from cognitive aspect**

| Question | SS | | S | | TS | | STSS | |
|---|---|---|---|---|---|---|---|---|
| | N | % | n | % | n | % | n | % |
| I understand people who have mentality healthy ones are able to work well | 46 | 46 | 39 | 39 | 12 | 12 | 3 | 3 |
| Often think things that are unrealistic and daydreaming can interfere with one's mental health | 15 | 15 | 55 | 55 | 25 | 25 | 5 | 5 |

***Cont...*** **Table 1. Distribution of Perception in students from cognitive aspect**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| I understand that people who have a healthy mentality will not cheat to win a race | 29 | 29 | 53 | 53 | 14 | 14 | 4 | 4 |
| I understand people who often get angry don't interfere with their mental health | 6 | 6 | 21 | 21 | 55 | 55 | 18 | 18 |
| Peace of mind can arise due to positive feelings | 52 | 52 | 44 | 44 | 4 | 4 | 0 | 0 |
| I understand that mentally healthy people can control their attitudes even when they are stressed | 26 | 26 | 63 | 63 | 8 | 8 | 3 | 3 |
| People who are confident can interfere with mental health | 0 | 0 | 12 | 12 | 58 | 58 | 30 | 30 |
| People who have erratic positions can influence their self-concept | 15 | 15 | 70 | 70 | 9 | 9 | 6 | 6 |
| I understand that people with mental disorders are people who refuse or run away from the reality of their lives | 13 | 13 | 53 | 53 | 32 | 32 | 2 | 2 |
| Rejecting the reality of life at hand does not interfere with his mental health | 5 | 5 | 17 | 17 | 66 | 66 | 12 | 12 |

Table 1 shows the distribution of students' perceptions based on aspects of cognition. Most respondents have the opinion that strongly agrees (46%) that mentally healthy people can work well. Most of the respondents also agreed (55%) about the opinion that the high imagination can cause mental health problems. Most respondents agreed (53%) with the statement that mentally healthy people can control themselves from cheating. Most respondents disagreed (55%) about the statement that being angry often did not interfere with mental health. Most respondents expressed strongly agree (52%) to the statement that positive feelings are caused by peace of mind. Most respondents felt agree (63%) of mind control statements can be done well by mentally healthy people. As many as 58% of respondents disagree with the statement that feeling too high in self-confidence can interfere with one's mental health. As many as 70% of respondents agree with the statement that people who do not have a good stance can influence their self-concept. Most respondents agreed (53%) with the statement that people tend to experience mental disorders when melting themselves from the reality of life. Most respondents disagreed (66%) with statements about the rejection of the fact of life does not interfere with mental health.

**Table 2. Distribution of Perception in students from affective aspect**

| Question | SS | | S | | TS | | STSS | |
|---|---|---|---|---|---|---|---|---|
| | N | % | n | % | n | % | n | % |
| I feel satisfied while doing everything I do efficiently | 58 | 58 | 38 | 38 | 2 | 2 | 2 | 2 |
| I feel under pressure when I have a lot of work piled up | 16 | 16 | 51 | 51 | 24 | 24 | 9 | 9 |
| I feel not disappointed when the activities that I do do not go according to the plan that has been arranged | 8 | 8 | 24 | 24 | 54 | 54 | 14 | 14 |
| I do not feel satisfied at all when being able to do more than one job at the same time | 6 | 6 | 14 | 14 | 63 | 63 | 17 | 17 |
| I feel jealous when my friends are very close to each other | 2 | 2 | 14 | 14 | 51 | 51 | 33 | 33 |

***Cont...*** **Table 2. Distribution of Perception in students from affective aspect**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| I feel satisfied when I can control my emotionweel, so I don't get angry when there is a quarrel | 51 | 51 | 46 | 46 | 3 | 3 | 0 | 0 |
| I feel happy when I am able to solve every problem calmly (without haste) | 67 | 67 | 29 | 29 | 4 | 4 | 0 | 0 |
| I feel sorry for people who hate each other | 31 | 31 | 55 | 55 | 11 | 11 | 3 | 3 |
| Feeling inferior will not affect self-concept (the views and attitudes of individuals towards themselves) | 7 | 7 | 33 | 33 | 46 | 46 | 14 | 14 |
| I feel confident when dressing comfortably and decently without following trends | 52 | 52 | 45 | 45 | 3 | 3 | 0 | 0 |
| I feel happy when I am able to do everything properly | 59 | 59 | 39 | 39 | 2 | 2 | 0 | 0 |
| I feel worried when I am unable to adapt to the campus environment as a new student | 26 | 26 | 57 | 57 | 14 | 14 | 3 | 3 |
| I feel worried for people who can't accept the reality of their lives | 24 | 24 | 69 | 69 | 6 | 6 | 1 | 1 |
| I don't feel any satisfaction when I am able to solve personal problems without involving others | 4 | 4 | 20 | 20 | 68 | 68 | 8 | 8 |

Table 2 shows the distribution of students' perceptions based on aspects of affection. Most respondents have an opinion that strongly agrees (58%) that respondents are satisfied with work efficiency. Most respondents agreed (51%) about opinions which stated that respondents felt depressed over the pile of work. Most respondents stated disagree (54%) with the statement that the respondent felt disappointed when the activity did not run smoothly. Most respondents disagreed (63%) about the statement that respondents felt dissatisfied when able to do 2 work together. Most respondents said that they did not agree (51%) to the statement that the respondents felt jealous of the closeness of their friends. Most respondents felt strongly agree (51%) to the statement that the respondent was satisfied when successfully controlling emotions.

Total 67% of respondents strongly agree when able to solve problems calmly. There are as 55% of respondents agreed with the statement that respondents felt sorry for people who hate each other. Most respondents felt disagree (46%) to the statement that he felt inferior would affect the self-concept. Most of the respondents strongly agreed to agree (52%) with the statement that respondents felt confident when dressing modestly even though they did not follow trends. respondents agreed (59%) with a statement he felt happy when able to do things according to his nature. As many as 57% of respondents agreed with the statement that the respondents felt worried not being able to adapt in the campus environment. Most of the respondents felt agree (69%) to the statement themselves feel worried about people who can not accept the reality of his life. Most of the respondents disagreed (68%) towards the statement saying that the respondent felt dissatisfied when able to solve personal problems.

## Discussion

The aspect of cognition becomes one of the aspects of perception consisting of knowledge. Knowledge possessed by someone is influenced by individual experience. The higher the knowledge ssomeone possessed, the more likely it will be to have a positive perception. But not always someone who has high knowledge also has a positive perception but can also have a negative perception. From the result above, it can be seen that the majority of respondents already have a good perception of mental health. Respondents can choose answers to statements in accordance with the nature of the question, answer agree or strongly agree to positive questions and vice versa [9].

People whose mental state is not good can influence their self-perception, so that it will affect their mindset, such as difficult to concentrate, apathetic, and difficult to carry out the planned activities. The positive thinking can have a good impact on the mental of students, so that they can adapt well to the environment as medical student. Campus life is a transition between adolescents towards maturity, so that students need see a realistic view of the world and see their limitations as an advantage [10].

Kulshrestha in his tsudy states that where students 'perceptions of mental health are strongly influenced by students' knowledge, regarding mental health. The higher the knowledge they have the more positive their perception will be. Students are expected to have good knowledge gained during the study process and have enough experience, so that they can become competent medical team when entering workforce [11].

Next is the aspect of affection. Affection aspects are composed of emotions and feelings that arise in certain phenomena and objects. The results above shows that respondents have positive affection. This is proofed by the condition of respondents who can recognize themselves, have a good self-concept. Ramchandra in his study states that emotions and feelings are one of the important things that influence the formation of students' perceptions of people with mental health. When a student has good well being and does not have a guilty state on him, he will have good mental health and be able to deal with problems that arise in his life [12].

## Conclusion

Based on the result above, it can be concluded that the perceptions students have of mental health tend to be positive. There is not a single question that has a negative response to the most choices, which means negative responses are only given by a small portion of students. This is expected to become insight for enlightment to make improvements to some students who still have negative or unfavorable perception of mental health.

**Ethical Clearance**: The research process involves participants in the survey using a questionnaire that was accordant with the ethical research principle based on the regulation of research ethic committee. The present study was carried out in accordance with the research principles. This study implemented the basic principle ethics of respect, beneficence, nonmaleficence, and justice.

**Conflict of Interest:** The author reports no conflict of interest of this work.

**Source of Funding:** This study is done with individual funding.

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# The Correlation between the Characteristic of Reflux Based on 24 Hours-Multichannel Intraluminal Impedance-Ph Monitoring with the Quality of Life of Refractory Laryngopharyngeal Reflux Patients

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## Abstract

The evaluation of the quality of life of LPR patients is crucial to assess the success of medical therapy and help with diagnosis. Assessment of life quality of patients with refsractory LPR by using the selected LPR-HRQL questionnaire because it is more practical to use, easy to set scoring and analyze data. **Objective**: This study aims at investigating the reflux characteristic and the correlation with refractory Laryngopharyngeal Reflux (LPR) patients quality of life. **Method**: The examination is performed on ten refractory LPR patients using 24hour - MultichanneI Intraluminal Impedance pH monitoring, then grouped according to the characteristics of the reflux acid, non-acidic, and mixed. Furthermore, the assessment of life quality by using LPR-HRQL questionnaire. Data analysis using Chi-Square and Spearman's Rho methods. **Results**: The sampleLPR refractory is generally female (66.7%), while males (33.3%). Mixed reflux type as much as 44.4%, then 33.3% acid reflux, and a non-acidic reflux 22.2%. LPR occurrence of majority at upright position (66.7%). Non-acid reflux patients consistently for all symptoms/complaints, indicating quality of life is disrupted based on questionnaires found in the LPR-HRQL (100%). **Conclusion**: The quality of life of non-acid reflux patients is more disturbed than the acidic and mixed reflux group.

***Keywords*** *: laryngopharyngeal reflux, 24hour - MultichanneI Intraluminal*

## Introduction

Laryngopharyngeal reflux (LPR) is a disease that often raises controversial opinion in diagnosis and treatment. In the LPR there is a retrograde flow of gastric contents into the larynx and pharynx subsequently causing discomfort and laryngeal changes[1.2] When the condition of the patient does not experience improvement in clinical symptoms or reduction of complaints either subjective or through objective examination with the endoscope, after undergoing empirical treatment of proton pump inhibitor (PPI)/standard therapy for a minimum of 3 months, this condition will develop into a refractory laryngeal reflux[3-5]

The diagnosis oh LPR has so far been based on anamnesis and clinical findings assessed using the scoring system introduced by Bellafsky at Al[6.7] namely Reflux Symptom Index (RSI) and Reflux Finding Score (RFS). The values of RSI > 13 and RFS > 7 are expressed abnormal. There are other test methods that are considered more effective for LPR diagnosis is with 24-hour multi-channel Intraluminal Impedance (pH-MII) pH monitoring, specifically detecting LPR patients who do not respond to PPI therapy. On that basis, the examination with 24 hours- pH MII is said to more accurately evaluate the chronology of reflux episodes and larynx symptoms.[6, 8, 9.10]

It is also the underlying study examines the relation between laryngeal reflux characteristic with the patient's quality of life using the tested LPR-HRQL questionnaire[11]

## Materials and Method

This study is an experimental analytical using the design of the cross sectional method. The subject of

the study was the refractory laryngeal reflux patients who came to the hospital Dr. Wahidin Sudirohusodo Makassar period in July until October 2019. The number of samples of 10 patients who have been diagnosed with refractory LPR is based on anamnesis, physical examination, and endoscopic examination. The ten patients undergo a pH-MII test, one sufferer on exclusion because the results of the pH-MII show no impedance activity. The sample consisted of three males (33.3%) and six women (66.7%). This study was declared to fulfill the ethical requirements to be implemented from the Biomedicine Research Ethics Commission on the Human Faculty of Medicine at Hasanuddin University.

**Inclusion criteria:**

The refractory LPR patients is willing to be the subject of study after being informed consent, cooperative and able to understand Indonesian language well, and range between 18-65 years old.

**Exclusion criteria**

History of laryngeal surgery or laryngeal trauma, patients with intralaryngeal disorders (e.g. mass), degenerative diseases, pregnant and smokers.

**Physical examination**

Anamnesa about the history of LPR patients treatment to ensure that the patient actually includes refractoryLPR that is the patients does not experience improvements in the clinical condition after three months empirical therapy with PPI And objectively confirmed by laringoscopy fiber optic examination[12] Further positive patients diagnosed with LPR refractory will undergo a 24-hour pH monitoring examination-Multichannel Intraluminal Impedance (pH-MII)

**24 Hour -*Multichannel Intraluminal Impedance pH monitoring (pH-MII)***

The pH-MII dual probes used in the study consists of a 2.3 mm polyurethane catheter that combines 6 impedance segments and two pH gauge electrodes. The catheter Model (UNISENSOR AG Bahnstrasse 12a 8544 Attikon, Switzerland) is used adjusted to the length of the patient's esophagus. This catheter form allows recording of changes in the impedance at each point achieved. In addition, pH monitoring of the Hypopharynx (proximal, pH1) and esophageal (distal, pH 8) is performed. With the direct visualization, the scope of the optic fiber is inserted in the nasal cavum to help put the prob. The pH-MII dual probe catheter is then inserted into the nose on the opposite side of the fiberoptic that has entered earlier. The electrode has two pH sensors along the appliance, the bottom is placed on the bottom oesophagus, about 5 cm above the lower sphinkter of the esophagus and the top is laid on the larynx, about 1-2 cm above the spinkter of the oesophagus. Then 6 channels of in impedance (Z1, Z2, Z3, Z4, Z5, and Z6) were placed on 17.15, 9, 7, 5, and 3 cm above the sphingter of the esophagus below respectively. The inspection equipment (prob) is attached to the external electronic data recorder for 24 hours to monitor the pH of the esophagus. During the 24-hour appliance, the patient is instructed to record and suppress the recorders data during meal times, changes in the position of the body (when lying or standing), drug consumption, and when the complaint arises. The tool is then released the next day, then the pH data is downloaded for analysis (Medical Measurement system Database Program).

LPR-HRQL (Laryngopharyngeal Reflux-Health Related Quality of Life)

This questionnaire consists of 43 question points, more specifically, and easy to use. LPR-HRQL uses a standard 7 point Likert scale to group patients based on the symptoms complained of. Scale for each question range 0 (never) to 6 (6-7 days per week). LPR-HRQL consists of 5 domains: voice/hoarseness (12 questions), cough (6 questions), throat clearing (6 questions), swallowing (5 questions). In addition, each domain is followed by a question aimed to explaining the primary domain affecting the overall quality of life (HRQL). The last domain, the Overall Impact Of Acid Reflux (OIAR), consists of 10 questions that assess the combination of symptoms that are associated with Refluks. The last question of each domain and OIAR question is worth a range of 1 (no effect on quality of life) up to 10 (a big impact on quality of life). In the Carrau et al study, this questionnaire showed convincing results. [12]

## Results and Discussion

The proximal reflux that is assessed as a meaningful reflux for the LPR diagnostic Enforcement is an episode of reflux that reaches two impedance sensors closest to

the oropharynx and occurs more than one reflux time. Reflux that reads with the pH of < 4 is expressed as an acid reflux (RA), a reflux with a pH > 4 expressed non-acidic reflux (RnA). And if the proximal reflux episode shows the pH of < 4 and > 4 alternately during the inspection process, then the patient is placed in the mixed reflux group.[13.14]

**Table 1. General characteristics of subjects (age and gender)**

| Variable | N= 9 | Percentage (%) |
|---|---|---|
| Age (year): | | |
| 20 - 30 | 1 | 11.1 |
| 31 - 40 | 4 | 44.4 |
| 41 - 50 | 3 | 33.3 |
| 51 – 60 | 1 | 11.1 |
| gender: | | |
| man | 3 | 33.3 |
| woman | 6 | 66.7 |

In this study, there were the most sample life distribution in the age group of 31-40 years (44.4%). With female samples (66.6%), males (33.3%). The average age of patients diagnosed with LPR in this study was 41 years.

Most of refractory LPR patients presented with a globus faringeus complaint (a sense of bump in the throat) as much as 66.7%. Two LPR patients (22.2%) comes with the main complaint of disphony and one person (11.1%) with heartburn complaints. Although *heartburn* is commonly found in GERD, ± 70% of cases, some previous studies have stated that < 40% of LPR patients are reported to have complained of *heartburn*[15, 16,17]

Based on the results of the pH-MII test, the patients is grouped into three categories based on the reflux type of non-acid reflux (NAR) group of 2 patients (22.2%), the Acid Reflux Group (AR) 3 patients (33.3%), and the mixed reflux group as much as 4 patients (44.4%).

It appears that mixed reflux patients dominates as much as 44.4%. In line with Lee JS's research at Al (2017) in his research on comparison of reflux characteristics based on LPR reflux type which also found that from 83 samples there were 59% that suffered from LPR mixed reflux and 41% non-acid reflux[18]

Previous studies have shown that not only acid reflux which causes damage to LPR patients but also pepsin (weak/non-acidic acid) and bile acids (can cause inflammation of both acidic and non-acidic ph conditions based on experimental studies) [(19,20)] Furthermore, recent studies have shown that pepsin is an agent that responsible for damage to the laryngeal mucosa of non-acidic reflux categories[19.21]

**Table 2. The category of reflux based on the content of reflux is fluid (liquid reflux) or a mixture of fluid + gas and the position of the reflux.**

| No. | Reflux Characteristics | Reflux content | | Body position when reflux occur | | |
|---|---|---|---|---|---|---|
| | | Liquid | Liquid + | Upright | Supine | Upright + |
| | | | gas | | | Supine |
| 1 | NAR | - | 2 | 1 | - | 1 |
| | | | 22.20% | 11.10% | | 11.10% |
| 2 | AR | 1 | 2 | 1 | - | 2 |
| | | 11.10% | 22.20% | 11.10% | | 22.20% |
| 3 | Mixed | - | 4 | 4 | - | - |
| | | | | | | |
| | (NAR+ AR) | | 44.50% | 44.50% | | |
| Total | | 1 | 8 | 6 | - | 3 |
| | | 11.10% | 88.90% | 66.70% | | 33.30% |

Abbreviations :

NAR : Non Acid Reflux

AR : Acid Reflux

Table 2 illustrates that the majority of patient reflux detected by pH-MII is a mixture of fluid and gas reflux content, which is 88.9%. Only 11.1% have reflux with purely fluid content alone, regardless of any reflux characteristics (acid, non-acid, or mixed).

The majority of faringeal reflux is gases, without pH decreased and is the same in normal people and laryngitis patients. Reflux in the form of a mixture of gases and liquids and only gas reflux with a significant decrease in pH more often in patients with laryngeal reflux disease[14, 22,23,24.]

It is apparent that majority of reflux occur when upright position (66.7%), while 33.3% patients experience reflux event in both positions when the upright and supine. None of these samples were subjected to reflux events while lying alone. LPR patients generally experience reflux when an upright position is known as a day-time reflux term, while the GERD sufferer is subjected to the main reflux when lying down. [(1,5,11)] in line with this, previous research by Arash et al against 109 reflux events at the time of TLESr, showing 91% of reflux events occurring in the upright position (upright) and 88% at the Baring position (supine). The relaxation of (Upper Sphincter Esophagus) USE at the transient of (Lower Sphincter Esophagus) LSE's relaxation is at an upright position with the occurrence of gastric fluid reflux and gas (81%), whereas USE contraction occurs most frequently in a bearing position dominated by gastric fluid regurgitation (82 %).[(25)]

**Table 3. Correlation of Acid reflux (AR), non-acid (NAR), and mixture (AR+ NAR) with complaints based on the LPR-HRQL questionnaire**

| No. | Complaints | Questionnaire | Reflux Characteristics | | | Total |
|---|---|---|---|---|---|---|
| | | LPR-HRQL | NAR | AR | Mixture | |
| 1 | Voice/hoarse | Disturbed | 2 (100%) | 2 (66,7%) | 1 (25%) | 5 (55,6%) |
| | | Not disturbed | 0 (0%) | 1 (33,3%) | 3 (75%) | 4 (44,4%) |
| 2 | Cough | Disturbed | 2 (100%) | 1 (33,3%) | 1 (25%) | 4 (44,4%) |
| | | Not disturbed | 0 (0%) | 2 (66,7%) | 3 (75%) | 5 (55,6%) |
| 3 | Clear Throat | Disturbed | 2 (100%) | 0 (0%) | 2 (50%) | 4 (44,4%) |
| | | Not disturbed | 0 (0%) | 3 (100%) | 2 (50%) | 5 (55,6%) |
| 4 | Swallow | Disturbed | 2 (100%) | 3 (100%) | 2 (50%) | 7 (77,8%) |
| | | Not disturbed | 0 (0%) | 0 (0%) | 2 (50%) | 2 (22,2%) |
| 5 | Overall impact | Disturbed | 2 (100%) | 2 (66,7%) | 4 (100%) | 8 (88,9%) |
| | Of Acid Reflux | Not disturbed | 0 (0%) | 1 (33,3%) | 0 (0%) | 1 (11,1%) |

Impaired quality of life due to complaints swallowing 100% occurred in the acid and non-acid reflux group, while in the mixed reflux group only 50% that disturbed the quality of life due to complaints of swallowing disorders.

The final scoring point of the LPR-HLQR Questionnaire on table 3 is that the overall reflux effect on the quality of life appears to greatly affect the non-acid reflux group and the mixture is reaching 100%, while in the Acid Reflux group, as much as 66.7% expressed overall reflux effect disrupting quality of life.

The correlation between the characteristics of reflux (acid, non-acidic, and mixed) with quality of life assessed using the LPR-HRQL questionnaire appears on tables 3. Consistently, a group of non-acidic reflux (NAR) patients demonstrated impaired quality of life (reaching 100%) based on the five main complaints that are focused on the questionnaire that is related to sound disorder/hoarseness, cough disorders, clear throat, swallowing disorders, and overall reflux impact on quality of life.

For a group of acid reflux, the quality of life seems disturbed with regards to cough, swallowing, noise disturbances, and overall reflux effects. The value of 100% disturbed quality of life only appears on complaints due to swallowing disorders. Likewise with a mixed reflux group, the value of 100% of quality of life is disrupted only at one point of the questionnaire that is related to the overall reflux impact on the quality of life.

In line with the research of Lee JS et al comparing the physical components of the non-acidic reflux group and the mixture based on the SF-12 questionnaire found that non-acidic reflux groups complained more symptoms compared to mixed reflux groups.[18]

Baclofen has been advised on the treatment of refractory GERD patients with the provision of twice daily. Although it shows improvements in handling the symptoms of GERD, its use in clinical practice is still limited due to the effects of intolerance.

## Conclusion

From this study can be concluded that there are differences in the quality of life of patients with refractory LPR reflux based on the difference in reflux character where the quality of life of non-acid reflux group is more disturbed than the acid and mixed reflux group.

**Ethical Clearance-** Taken from Hasanuddin University ethical committee

**Source of Funding-** Self

**Conflict of Interest** – Nil

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# Tympanogram and Audiogram Presentation after Tympanomastoidectomy Surgery Using Musculus Temporalis Fascia Profunda Graft and Composite Graft

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## Abstract

In recent decades, there has been an increase in the use of composite graft in the closure of the tympanic membrane perforation. The aim of this research is to know the change of tympanogram and audiogram presentation after tympanomastoidectomy surgery using musculus temporalis fascia profunda graft and composite graft. Experimental research was being conducted on 22 Otitis Media Suppurative Chronic patients without cholesteatoma such as 14 patients using musculus temporalis fascia profunda graft and 8 patients using composite graft. The Audiometric tests were being administered twice, before and after tympanomastoidectomy surgery, in other hand tympanometry test was being performed after surgery. Data analysis using independent-t test, paire-t test, and chi square test. The research has shown that the Pure Tone Audiometry post-surgeries were being found higher on composite graft (68,4) in comparison with musculus temporalis fascia profunda graft (55,1), but statistically non-significant (p>0,05). On the contrary, on fascia graft group was being found significantly higher 1,47 than amplitudo composite graft (0,87), statistically significant (p<0,001). Clinical meaning of using musculus temporalis fascia profunda graft is better than composite graft in terms of hearing and tympanic membrane elasticity.

***Key words:*** *musculus temporalis fascia profunda graft, composite graft, tympanomastoidectomy*

## Introduction

The tympanic membrane is a living tissue located in the middle ear. The first component of the middle ear that is useful for receiving sound waves is the tympanic membrane, also known as the eardrum. Sound waves vibrate the tympanic membrane through a small series of auditory bones, namely malleus, incus and stapes[1]. The time limit of 2 months varies from country to country. WHO set a time limit of 2 weeks. Most ENT-KL specialists take a 3-month limit[2].

Chronic suppurative otitis media (CSOM) is divided into two namely chronic otitis media without cholestatoma and with cholesteatoma, both of which are distinguished by looking at the inflammatory process, the presence or absence of cholesteatoma and the location of the tympanic membrane perforation with different management. The incidence of otitis media is influenced by various factors including age, nutrition, socio-economic level, immunity factors and the frequency of suffering from upper respiratory tract infections[3]

Closure of the tympanic membrane is very important to prevent recurrent infections, restore hearing, and protect the structure of the middle and inner ear. Timpanoplasty can be performed with a variety of different graft techniques and materials[4,5]. In recent decades, there has been an increase in the use of composite graft in the closure of the tympanic membrane perforation. Timpanoplasty using a graft composite as tympanic membranes have a better success rate in the treatment of CSOM, due to the low need for graft nutrition, suitable for difficult conditions, in subtotal perforations, adhesive otitis media, revision surgery and tubal dysfunction[6,7].

Many autologists use composites as a graft material because of their good stability, resistance to negative middle ear pressure and not easy postoperative perforation.

Regular control after tympanomastoidectomy prevents reperforation from Chavan et al.,[8] Kumar et al.,[9] and Previous research by Tao et al[10] found that temporal graft fascia has more advantages such as being easier to extract, more quantity, relatively transparent, thinner and more flexible, but its elasticity strength as a low tympanic membrane makes it far more susceptible to negative pressure from the middle ear. Based on the background above, this study aims to determine changes in the image of tympanogram and audiogram postoperative tympanomastoidectomy using deep temporalis muscular graft fascia and composite graft.

## Materials and Method

Research Location and Time

The study was conducted at the Wahidin Sudirohusodo Makassar hospital at the central ENT-KL and COT clinic, which began in July - September 2019.

Research Design and Variables

This research is an experimental research (prospective observational study) with a design using groups with simple randomization. The research variables consisted of: independent variables (CSOM), dependent variables (pure tone audiometry (PTA) and Timpanogram), control variables (composite graft and temporalis muscular graft fascia), and intermediate variables (perforation and closure of the tympanic membrane perforation).

**Population and Sample**

The study population was Chronic Rhinosinusitis sufferers who met the inclusion criteria who came to the ENT-KL Polyclinic at the General Hospital. Dr. Wahidin Sudirohusodo and RS Network in Makassar.

**Method of collecting data**

In the ear with otore, first clean the secretions with an applicator and suction. Investigations were carried out: laboratory, plain mastoid photographs, temporal bone CT scans and PTA. Then the sample was divided into 2 treatment groups, namely: Group 1 using composite graft (temporalis and composite muscular fascia) and Group 2 using temporal muscular graft fascia, and tympanomastoidectomy and postoperative procedures.

**Data analysis technique**

The data collected is then processed and analyzed using the SPSS for windows program. The statistical test used was a t test to compare audiological results before surgery and after surgery between graft composites (temporal muscular fascia and composite) and temporal muscular graft fascia with tympanomastoidectomy techniques, the level of significance used was $\beta = 0.20$. All analysis results are displayed in tabular or graphical form accompanied by an explanation.

## Results

An experimental study (prospective observational study) has been conducted with a design using a group with simple randomization to determine changes in the image of tympanogram and audiogram postoperatively of tympanomastoidectomy using deep temporalis musculature fascia graft and composite graft. The highest tympanogram type obtained in this study is type A with sample 12 (54.54%) compliance value 0.3-1.6, As type with sample 7 (31.81%) compliance value <0.3, and type of Ad sample number 3 (13.63%) compliance value> 1.6 (Table 1).

**Table 1. Type of Tematogram Post Timpanomastoidectomy Surgery**

| No | Tipe Timpanogram | N | % |
|---|---|---|---|
| 1 | Tipe Ad | 3 | 13,63 |
| 2 | Tipe As | 7 | 31,81 |
| 3 | Tipe A | 12 | 54,54 |

The use of bone gap water (ABG) with graft fascia obtained a value of <10db of 5 (35.71%), 10-15db of 5 (35.71%) and> 15db of 4 (28.57%). In the use of composite graft, there was a water bone gap (ABG) with a value of <10db as much as 1 (12.5%), 10-15-15 as many (25%) and> 15db as much as 5 (62.5%) (Table 2)

**Table 2. Air Bone Gap (ABG) Pasca Operasi Berdasarkan Jenis Graft**

| No | Air Bone Gap (ABG) | Graft Fascia Muskulus Temporalis Profunda | | Graft Komposit | |
|---|---|---|---|---|---|
| | | Total | % | Total | % |
| 1 | < 10 | 5 | 35,71 | 1 | 12,5 |
| 2 | 10 – 15 | 5 | 35,71 | 2 | 25 |
| 3 | > 15 | 4 | 28,57 | 5 | 62,5 |
| 4 | Total | 14 | 100 | 8 | 100 |

The hearing threshold is based on PTA preoperative tympanomastoidectomy. For hearing values 26-40 db sample size 1 (4.54%), 41-60 db sample size 7 (31.81%), 61-80 db sample size 7 (31.81%) and> 81db sample size 7 (31.81%). While the hearing threshold postoperative tympanomastoidectomy obtained a hearing value of 26-40 db sample size 6 (27.27%), 41-60 db sample size 8 (36.36%), 61-80 db sample size 5 (22.72% ) and> 81db of sample size 3 (13.63%) (Table 3).

**Table 3. Hearing Examination Based on Pure Tone Audiometry (PTA) Pre and Post Thrombomastoidectomy Surgery**

| No | Ambang Dengar | Pre Operasi | | Post Operasi | |
|---|---|---|---|---|---|
| | | N | % | N | % |
| 1 | 26-40 db | 1 | 4,54 | 6 | 27,27 |
| 2 | 41-60 db | 7 | 31,81 | 8 | 36,36 |
| 3 | 61-80 db | 7 | 31,81 | 5 | 22,72 |
| 4 | >81 db | 7 | 31,81 | 3 | 13,63 |
| 5 | Total | 22 | 100 | 22 | 100 |

Comparison of PTA by graft type shows that Preoperative PTA was found to be higher in composite graft (74.0) than in deep temporalis muscular fascia (65.5), but not statistically significant (p> 0.05). Postoperative PTA was found to be higher in the composite graft (68.4) than in the deep temporalis muscular fascia (55.1), but not statistically significant (p> 0.05) (Table 4).

**Table 4. PTA Comparison by Graft Type**

| No | Variabel | Graft | N | Mean | SD | p |
|---|---|---|---|---|---|---|
| 1 | PTA Preoperasi | Fascia | 14 | 65,5 | 22,1 | 0,379 |
| | | Komposit | 8 | 74,0 | 19,6 | |
| 2 | PTA Post Operasi | Fascia | 14 | 55,1 | 19,6 | 0,165 |
| | | Komposit | 8 | 68,4 | 23,1 | |

Independent-t test

Comparison of preoperative and postoperative PTA showed that in the graft fascia group, it was found that postoperative PTA was significantly lower than preoperative PTA, which was 65.5 compared to 55.1 ($p < 0.05$). In the composite graft group, postoperative PTA was found (68.4) lower than preoperative PTA (74.0), but not statistically significant ($p > 0.05$) (appendix, Table 5).

**Table 5. Comparison of Preoperative and Postoperative PTA**

| No | Graft | Variabel | n | Mean | SD | p |
|---|---|---|---|---|---|---|
| 1 | Fascia | PTA preoperasi | 14 | 65,5 | 22,1 | 0,014 |
| | | PTA post operasi | 14 | 55,1 | 19,6 | |
| 2 | Komposit | PTA preoperasi | 8 | 74,0 | 19,6 | 0,303 |
| | | PTA post operasi | 8 | 68,4 | 23,1 | |

Paired-t test

## Discussion

This study showed that postoperative pure tone audiometry (PTA) was found to be higher in composite graft compared to deep temporalis muscular fascia, but not statistically significant. Whereas in the graft fascia group, post operative amplitude was significantly higher than composite graft amplitude, and was statistically significant. In the study the most samples were found in the age group of 08-20 years with 10 samples (45.45%) followed by the age group of 21-40 years with 6 samples (27.27%) and the age group 41-60 years each as many as 6 samples (27.27%), the number of samples in adults and parents is less than in the age of children and adolescents.

Most sex in this study were women with a ratio of 1.8: 1 compared to men. The total sample of men was 8 samples (36.36%) and women contained 14 samples (63.63%). Based on the size of the perforation, obtained subtotal perforation of 13 (59.09%) and total perforation of 9 (49.90%). The main factors contributing to the area of tympanic membrane perforation are chronic infection, impaired tubal function and a history of allergies This study uses 2 types of graft, namely composite graft and deep temporalis musculature graft fascia. The number of graft composites used was 8 (36.36%) and temporalis fascia graft as many as 14 (63.63%), more widely used compared to graft composites. The use of temporal fascial grafts in subtotal perforations is most commonly used in tympanomastoidectomy operations, with success rates between 93% and 97%. But in recent decades, there has been an increase in interest by using cartilage graft (composite) as the main alternative.

Research conducted in India by Santhanakrishnan et al, [5] also used more temporalis graft 23 samples (54.76%) and graft composite as many as 19 samples (45.23%). Santhanakrishnan et al (2017), using deep temporalis graft fascia to cover small and subtotal perforations, while for large (total) perforations using graft composites. Temporalis fascia graft is an excellent graft material for closure of the tympanic membrane perforation accompanied by increased hearing.

The results of the tympanogram type from this study showed that the highest tympanogram type was type A as many as 12 (54.54%), followed by As type tympanogram as much as 7 (31.81%) and tympanogram type Ad as much as 3 (13.63%). The state of pressure in the middle ear, tympanic membrane integrity and mobility of auditory bones can be evaluated after tympanomastoidectomy surgery. Different results are

obtained from the two types of graft used. The results of tympanogram using temporalis graft were better than that of composite graft. Compliance of the tympanic membrane and ocular system under various positive and normal pressure conditions is better in deep temporalis muscular graft fascia. It can easily be understood that compliance the maximum tympanic membrane will be reached when the air pressure on both sides is balanced or equal[10-12].

Based on the degree of hearing loss and deafness, this study was divided into conductive type hearing loss, sensorinueral type hearing loss and mixed type hearing loss. In patients with CSOM who treated Wahidin Sudirohusodo Hospital and RSPTN Hasanuddin University Makassar obtained hearing loss and conductive type deafness as many as 14 samples (63.63%), hearing loss and mixed type deafness were 8 samples (36.36%) and hearing loss and sensorinueral deafness is absent. In a study in India conducted by Kumar et all[9], it was slightly different where it only took hearing impairment and conductive deafness with a total sample of 46. From research conducted at Wahidin Sudirohusodo General Hospital and RSPTN UNHAS it was found that the types of hearing loss and deafness were highest in patients is a conductive type of hearing loss.

In this study, it was found that postoperative PTA using temporalis muscular graft fascia was 14 (63.63%), composite graft was 8 (36.36%). Using the Paired t-test found in the graft fascia group, it was found that postoperative PTA was significantly lower than PTA Pre surgery, which was 65.5 compared to 55.1 ($p < 0.05$). In the composite graft group, postoperative PTA was found (68.4) lower than preoperative PTA (74.0), but not statistically significant ($p > 0.05$). Using preoperative Independent PTA t-test was found to be higher in composite graft (74.0) than in deep temporalis muscular fascia (65.5), but not statistically significant ($p > 0.05$). Postoperative PTA was found to be higher in composite graft (68.4) than in deep temporalis muscular fascia (55.1), but not statistically significant ($p > 0.05$). In the preoperative PTA examination results obtained for the hearing threshold value of 26-40 db sample size 1 (4.54%), 41-60 db sample size 7 (31.81%), 61-80 db sample size 7 (31.81 %) and> 81db of sample size 7 (31.81%). While post-operative PTA obtained results for the hearing threshold value 26-40 db sample size 6 (27.27%), 41-60 db sample size 8 (36.36%), 61-80 db sample size 5 (22.72%) and> 81db sample size 3 (13.63%). There was an improvement in the results of postoperative audiometry examination at the hearing threshold of 26-40db for 5 samples, 41-60db for 1 sample, 61-80db for 2 samples and> 80db for 4 samples.

In this study showed that in the deep temporalis muscular fascia, PTA Air Bone Gap <10db of 5 samples (35.71%), 10-15db of 5 samples (35.71%) and> 15db of 4 samples (28.57%) , while those using graft composites obtained <10db of 1 sample (12.5%), 10-15db of 2 samples (25%) and> 15db of 5 (10%). From the results of our research at Wahidin Sudirohusodo General Hospital Makassar and RSPTN UNHAS using temporalis graft fascia graft, the water bone gap (ABG) was improved compared to those using graft composites. In this study the amplitude comparison results can be seen by using 2 different types of graft. This study used 22 samples in which 14 patients used deep muscularis fascia graft and 8 used composite graft. From the results of postoperative tympanomastoidectomy, type A with a sample size of 12 (54.54%), then type As with a sample size of 7 (31.81%) and type Ad with a sample size of 3 (13.63%). Postoperative amplitude was found to be significantly higher in the deep temporalis muscle graft fascia of 1.43 compared to composite graft, which was 0.80 ($p < 0.05$).

Using the Paired t-test obtained in the fascia graft group, the postoperative amplitude was significantly higher 1.47 compared to the composite graft amplitude of 0.87, statistically significant ($p < 0.001$). From our research at RSUP Wahidin Sudirohusodo Makassar and RSPTN UNHAS using temporalis graft fascia graft results obtained tympanometry with better amplitude compared to using graft composites. There was a very significant increase before and after surgery. In this study there are limitations of the study, namely: not carried out monitoring in a sufficient period of time in the growth of the graft both temporal fascia and composite graft, the number of samples is limited, and no examination of PTA and tympanometry 6 months postoperatively.

## Conclusions and Recommendations

Researchers concluded that the use of temporalis muscular graft fascia was better than composite graft in

terms of hearing enhancement (PTA). Tympanometry and elasticity of the tympanic membrane using temporalis muscular graft fascia are better in terms of amplitude values compared to graft composites. The process of healing from a wound better postoperatively in the temporalis muscular graft fascia. Graft composites in terms of resistance to middle ear pressure are better than temporalis muscular graft fascia, so graft composites are not easily perforated. Researchers suggest that further research be done with a longer research time. Conducted research with a larger number of samples.

**Ethical Clearance**- Taken from Hasanuddin University ethical committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

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# Risk Factors of Lung Tuberculosis Occurence in the Working Area of Kaluku Bodoa Health Center Makassar City

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## Abstract

Makassar City is one of the coastal areas that are vulnerable to the transmission of pulmonary Tuberculosis (TB). The condition of population density in the area can increase the risk of transmission.

The aims of the study to determine the risk factors for the occurrence of pulmonary TB in the coastal area of Makassar city. The Design study is case control. Cases are pulmonary TB patients recorded in the medical record of Kaluku Bodoa Health Center. Control is TB suspects who have experienced symptoms of a cough more than 2 weeks and do not have positive TB. The number of samples is 120 with details of 60 cases and 60 controls. Data analysis was used by bivariate and multivariate with odds ratio & logistic regression tests.

The results showed that occupancy density (OR: 2.33; 95% CI: 1.103-4.935) and TB contact (OR: 9.077; 95% CI: 1.098-75.02) were risk factors for pulmonary TB, while poor families (OR : 1.909; 95% CI: 0.811-4.493) and smoking behavior (OR: 1.336; 95% CI: 0.463-3.856) is not a risk factor for the incidence of Pulmonary TB. The conclusion in this study is the probability of the occurrence of pulmonary TB in subjects whose home density is <10 $m^2$ / person and has a contact history with pulmonary TB patients, which is 92%.

For Suggestions need health promotion for coastal communities regarding healthy life behavior (PHBS) and ways to reduce the risk of pulmonary TB transmission.

***Keyword*** *:Pulmonary TB, contact TB, occupancy density*

## Introduction

Pulmonary tuberculosis (TB) is one of the largest infectious diseases in the world. This disease is still a serious problem, especially in developing countries like Indonesia[1]. The number of new cases of AFB (+) pulmonary TB in Indonesia was recorded at 1561723 and 74.96% of it belonged to the productive age with a Case Detection Rate (CDR) of 60.59%. South Sulawesi Province was one of the provinces that had the largest AFB (+) cases, namely 12.972 cases and a prevalence of 257 per 100.000 population[2].

The case of pulmonary TB in Makassar City showed fluctuating numbers. There were 2.166 cases in 2014, then increased to 2.372 new cases of positive AFB TB in 2015. In 2016, the total cases became 3.917 cases, but new positive AFB cases decreased to 1.850[3]. Although new cases had decreased, the prevalence of TB in the community was still quite high. This high prevalence rate allowed a large number of infections to occur. This was supported by the high density of Makassar City and residential environment that supported TB transmission, especially in the western part of Makassar City, which was a populous and poor coastal area.

Coastal area is vulnerable to the spread of infectious diseases, including tuberculosis (TB). One of the coastal areas in Makassar City that had a quite high number of pulmonary TB cases was the working area of Kaluku Bodoa Community Health Center. Based on the data of Public Health Office of Makassar [3] the number of cases in Kaluku Bodoa Village was 77 cases with the proportion of positive AFB reaching 46.6% of the number of suspected

pulmonary TB found. In addition to poor environmental condition, several things also became risk factors for TB cases, such as age, occupancy density, socioeconomic status, smoking behavior, distance between houses, and contact history. Those factors contributed to the increase of TB cases in an area[4]. Therefore, this research was to find out risk factors that affected TB cases in the coastal areas of Makassar City.

## Material and Method

This was an observational research with a Case Control research design. Data was obtained from Kaluku Bodoa Health Center in Makassar City. Case population was positive AFB pulmonary TB patients recorded in TB 03 form (TB register) in 2018 and 2019. Control population was suspected TB patients recorded in TB register. Sample was 120 people divided into case and control group with a ratio of 1: 1 so that each group consisted of 60 people. Sample calculation used was the Lameshow formula. Sampling technique used was the simple random sampling. Data collection instrument used was a structured questionnaire. The data were analyzed in descriptive, bivariate, and multivariate analysis.

## Results

Results of the descriptive analysis can be seen in table 1. The case group was dominated by male respondents, namely 43 people (71.7%). The number of respondents was higher in the Productive age group (11-50 years old) in the case group by 41 people (68.3%) and in the control group by 43 people (71.7%). The education background of respondents was mostly in the high school graduate group by 21 people (35%) and 30 people (50%). The occupation of respondents was dominated by workers and housewives in both case and control group.

**Table 1. Distribution of respondents' characteristics in the coastal area of Kaluku Bodoa Village, Makassar City**

| Respondents' Characteristics | Pulmonary TB case | | | | Total | |
|---|---|---|---|---|---|---|
| | Case | | Control | | | |
| | n | % | n | % | n | % |
| Sex | | | | | | |
| Male | 43 | 71.7 | 33 | 55.0 | 76 | 63.3 |
| Female | 17 | 28.3 | 27 | 45.0 | 44 | 36.7 |
| Age group | | | | | | |
| Children | 1 | 1.7 | 0 | 0.0 | 1 | 0.8 |
| Productive | 41 | 68.3 | 43 | 71.7 | 84 | 70.0 |
| Elderly | 18 | 30.0 | 17 | 28.3 | 35 | 29.2 |
| Education | | | | | | |
| Not Attending School/Not Completing Elementary School | 6 | 10.0 | 1 | 1.7 | 7 | 5.8 |
| Elementary School Graduate | 18 | 30.0 | 15 | 25.0 | 33 | 27.5 |
| Junior High School Graduate | 9 | 15.0 | 12 | 20.0 | 21 | 17.5 |
| Senior High School Graduate | 21 | 35.0 | 30 | 50.0 | 51 | 42.5 |
| College Graduate | 6 | 10.0 | 2 | 3.3 | 8 | 6.7 |
| Occupation | | | | | | |
| Jobless | 7 | 11.7 | 6 | 10.0 | 13 | 10.8 |
| Housewife | 11 | 18.3 | 20 | 33,3 | 31 | 25.8 |

***Cont...*** **Table 1. Distribution of respondents' characteristics in the coastal area of Kaluku Bodoa Village, Makassar City**

| | | | | | | |
|---|---|---|---|---|---|---|
| Labor | 18 | 30.0 | 18 | 30.0 | 36 | 30.0 |
| Entrepreneur | 10 | 16.7 | 5 | 8.3 | 15 | 12.5 |
| Motorcycle taxi driver | 1 | 1.7 | 1 | 1.7 | 2 | 1.7 |
| Private employee | 5 | 8.3 | 6 | 10.0 | 11 | 9.2 |
| State Civil Apparatus | 4 | 6.7 | 1 | 1.7 | 5 | 4.2 |
| Student | 4 | 6.7 | 3 | 5.0 | 7 | 5.8 |

Table 2 presents the results of risk factors analysis for pulmonary TB cases in the coastal area of Makassar City. From the analysis results, it was found that there were 2 main variables that were statistically significant as risk factors for pulmonary TB cases in the coastal area of Makassar City, namely residential density and contact history with patients with pulmonary TB. Respondents with occupancy density that did not meet the requirements (<10m2/person) had 2.33 times greater risk of developing pulmonary TB disease compared to respondents with qualified occupancy density (95% CI: 1.103-4.935). In addition, the research results also showed that people with a history of household contact with pulmonary TB patients having 9 times greater risk (95% CI: 1.098-75.02) for the case of pulmonary TB disease compared to people who did not have any history of household contact with pulmonary TB patients. The results were statistically significant.

**Table 2. Results of Bivariate Analysis of Pulmonary TB Risk Factors**

The research results also showed that there were two research variables that had no statistically significant relationship, namely the poor family variable with an OR value of 1.909 (95% CI: 0.811-4.493) and smoking behavior with an OR value of 1.336 (95% CI: 0.463 -3.856). Nevertheless, it can be seen that this variable had the potential to become a risk factor. One of them was the poor economic/financial family condition. Poor families who had pulmonary TB was 18 people (30%) greater in proportion than poor families who did not have pulmonary TB, which was 11 people (18.3%). Smoking status also showed no statistically significant results, because the proportion of smokers in both the case and control groups was relatively the same, namely 53 (88.3%) people in case group and 51 people (85%) in control group.

**Table 3. Multivariate logistic regression analysis**

| No | Risk Factors | B | OR | 95% CI | p-value |
|---|---|---|---|---|---|
| 1 | Occupancy Density | 0.806 | 2.239 | 1.041-4.817 | 0.039 |
| 2 | Contact History | 2.135 | 8.461 | 1.006-71.169 | 0.049 |
| | Constant | -0.441 | 0.643 | - | 0.074 |

Table 3 shows the results of the multivariate logistic regression analysis of the independent variables affecting pulmonary TB. From the analysis results, a suitable model was obtained with the equation as follows:

Ln $(\frac{p}{p-1}\frac{p}{p-1})$ = -0.441+ 0.806 occupation density + 2.135 contact history

With this equation, it was possible to calculate the chance of pulmonary TB occurring in the coastal area of

Makassar city on subjects whose house density was <10 m2/person and had a history of contact with pulmonary TB patients with the following calculation:

$$= -0,441 + (0,806 \times 1) + (2,135 \times 1) = 2.5$$

The result was:

$$P = 1 / (1 + \exp^{(-2.5)}) = 0.92 \text{ or } 92\%$$

So, the chance of pulmonary TB case in the coastal area of Makassar city on subjects whose house density was <10 m2/person and had a history of contact with pulmonary TB patients was 92%.

## Discussion

Occupancy density is a risk factor for pulmonary TB case. Dense housing allows the proliferation of microbes that is quite high and increases the risk of high pulmonary TB transmission, especially if there are people with pulmonary TB in the house. This condition can increase the risk if the house environment has less ventilation and unqualified lighting[5]. This is also supported by previous research conducted by Wulandari et al (2015)[6], showing that one of the factors that have proven to be influential as risk factors for pulmonary TB disease is the occupancy density factor (p = 0.002).

The research results also show that household contact with previous pulmonary TB patients has a high risk of transmission of pulmonary TB. This indicates that household contact is a significant threat to other family members because the exposure occurs in the environment around the house. So, the risk for contracting is very high. The similar case occurs in research by Fitriani (2013)[7], which shows the correlation between contact history and pulmonary TB.

The rate of TB transmission in the environment of patients' family is quite high, in which a patient can transmit it to 2-3 people in his/her home, while the risk of transmission for households with more than one patient with pulmonary TB is 4 times greater than households with only one patient with pulmonary TB. Other research by Mahpudin and Mahkota (2007)[8] shows that the source of household contact is significantly associated with the case of AFB (+) pulmonary TB. Those who live in a house with contacts are at risk of suffering from tuberculosis 3.46 times greater than those who have no household contact. Likewise, research by Kirenga *et al* (2015)9 in Uganda find that contact with TB patients has 11.5 times risk (95% CI: 8.4-15.2) to suffer pulmonary TB. Delay in health check/pulmonary TB screening can result in late treatment which can worsen pulmonary TB disease suffered by other family members. TB program implementation in each region is constrained by several factors, one of which is the discovery of new cases that are still lacking and the limited human resources of the TB program will be a challenge in reducing the case of pulmonary TB[10].

The research results also find that poor family status and smoking habits are not risk factors for pulmonary TB events. However, the poor family variable has the potential to be a risk factor because the proportion of poor families who suffer from TB is greater than those without pulmonary TB. This is due to the early examination and relatively cheap pulmonary TB treatment since underprivileged members of the community are supported by the government through the Indonesian National Health Insurance (BPJS kesehatan). Research in Uganda show different results, income below the poverty threshold (1.25 USD/day) generates a high risk of tuberculosis transmission with an OR = 39.5 (95% CI: 34.4-44.7)[9]. Likewise, research by Mahpudin and Mahkota,[8] states that in the health aspect, those with poor economic capacity find it difficult to meet the nutritional needs, healthy shelter, and health care so that the risk of pulmonary TB disease is very high.

In addition, the smoking variable in this research has no correlation with the case of pulmonary TB. Research by Wen *et al* [11] shows different results, which mention that smoking is a risk factor for the case of pulmonary TB with an OR value of 1.17 (95% CI: 1.1-1.3).

However, the results of our research are relatively similar to research in India conducted by Bhat *et al* [12], which also indicates that smoking is not a risk factor for TB with an OR value of 1.03 (95% CI: 0.72-1.48). Similarly, research in Wonogiri Regency, Central Java, shows that smoking is not a risk factor for the case of pulmonary TB with an OR value of 1.4 (95% CI: 0.5-3.7)[13].

In principle, smoking behavior is not the cause of pulmonary TB. The pulmonary TB agent, namely *Micobacterium tuberculosis*, is transmitted through air/

droplet. Smoking is a factor that exacerbates pulmonary TB[14].

## Conclusions And Suggestion

### Conclusions

From the research results, it can be concluded that:

1. Occupancy density (<10 m2/person) and contact history with pulmonary TB patients are risk factors for pulmonary TB.

2. Poor family status and smoking behavior are not risk factors for pulmonary TB.

3. The probability of pulmonary TB case in the coastal area of Makassar city on subject with a house density of <10 m2/person and a history of contact with pulmonary TB patients is 92%.

### Suggestions

1. Special attention needs to be paid to coastal communities, especially those who live in densely populated settlements with high occupancy density. They need to learn clean and healthy living behaviors and ways to reduce the risk of pulmonary TB transmission.

2. Families who have family members suffering pulmonary TB should use masks and separate tableware with the patients to minimize transmission. They also need to check their health frequently at the health center if symptoms of pulmonary TB appear so that treatment can be performed quickly.

### Acknowledgement

The researcher would like to thank the Head of Makassar City Health Office and Kaluku Bodoa Public Health Center for the assistance during the research.

**Ethical Clearance**- Taken from Faculty of Public Health ethical committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

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# Difference of Predisposing Factors with Notification Pulmonary TB through Rapid Moleculer Test and Specimen Transportation Method of TB Health Centre Staff

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## Abstract

In 2017 North Sumatera province had a TB incident of 73,488 with CDR BTA(+) 65,7%, and CNR of 185/100.000 population higher than Indonesia. CDR BTA(+) Deli Serdang District is 61,6% is below than CDR average of North Sumatera province 65,7%. The Deli Serdang District is one of the fostered area of the international NGO KNCV to accelerate the process of elimination of TB by providing facilities assistance and improvement of human resources. The purpose of this research is to analyze the relationship predisposing factors of pulmonary TB staff in Health Centre to achieve the case notification of pulmonary TB through Rapid Moleculer Test with Xpert MTB/RIF and Specimen Transportation methods. This research using cross sectional design and population is all TB staff (34 staffs) in the Health Centres in Deli Serdang District where is each Health centre has 1 TB staff. Data collection is conducted with interviews using pre-tested questionnaires and get approval from the Ethics committee of the Faculty of Nursing Universitas Sumatera Utara. Analyzed using the Mann-Whitney test and Kruskall Wallis. The result of this research there is no relationship of predisposing factors with the Pulmonary TB case notification using Rapid Moleculer Test and Specimen Transportation method in Deli Serdang District.

***Keywords:*** *Pulmonary TB, Rapid Molecular Test, Specimen Transportation, Predisposing factor*

## Background

In 2016 the estimated pulmonary TB incident in Southeast Asia at the highest of 45%. Indonesia has a new case of TB as many as 420,994 cases in 2017 with the Case Notification Rate (CNR) 161/100,000 population, and Case Detection Rate (CDR) 47%[1].

In 2017 North Sumatera province had a TB incident of 73,488 with CDR BTA(+) 65,7%, and CNR of 185/100.000 population higher than Indonesia. CDR BTA(+) Deli Serdang District is 61,6% is below of CDR average North Sumatera province 65,7%[2]. In 2016 the total number of TB cases in the health facilities of Deli Serdang 2,806 cases are divided in several places such as hospitals, Health centre, clinics, and prison. There was a significant difference in the discovery of a new case after an equitable intervention of lung TB in all regencies/ cities. Deli Serdang is one of the demonstration areas of the international Non Government Organization Koninklijke Nederlandse Centrale Vereniging (NGO KNCV) to accelerate the process of elimination of TB by providing facilities and improvement of human resources in North Sumatera province. KNCV in each Regency/city, be equipped a facility for notification of the case with a Rapid Moleculer Test and also given Specimen Transportation.

The strategy of TB case notification in Deli Serdang District followed the WHO recommendation diagnosis of bacteriological examina-tion using microscopic of the Acid Fast Bacillus (AFB).

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Rapid Molecular Test with GeneXpert Mycobacterium Tuberculosis / Rifampisin (Xpert MTB/RIF) is fast and can identify the presence of MTB and resistances against rifampicin simultaneously, so that early initiation of accurate therapy can be administered and can reduce the incidence of TB in general. At this time, the only molecular examination includes all the necessary reaction elements including the entire reagent for the Polymerase Chain Reaction (PCR) process in one cathrid with a Rapid Moleculer Test examination with Xpert MTB/RIF. Xpert examination of MTB/RIF can be qualitatively detect complex MTB DNA from specimens directly through sputum and non-sputum and also can detect mutations in the rpoB gene that causes resistance to rifampicin. TB and resistance to rifampicin can be diagnosed with Xpert MTB/RIF examination quickly and accurately[3]

Information systems to monitor the movement of delivery of package test samples ranging from order process, courier pickup, acceptance confirmation, feedback related test sample conditions to the recapitulation of test sample results which are Development of information Systems Tracking for specimen Transport. Specimen Transportation is used to send and receive test samples, consisting of a web-based application for managing data, Specimen Transportation user accounts and Android-based mobile applications. The Program management staff, laboratory analysts of the health centre and jail clinics, couriers, health office and Sub-Directorate of TB are the primary users of this information system. In addition to having functions as a tracking tool, Specimen Transportation also supports recording recapitulation and delivery reporting of test samples electronic[3]. Saomi's research et al (2013) states there is an educational background relationship ($p$ = 0,027; OR = 8.0) and knowledge ($p$ = 0,023; OR = 9.75) to the invention of the lung TB[4]. Rye, et,al (2007) states there is a relationship in the between suspect of TB (OR = 8.92; 95% CI 2.36-38,65), Communication Information and Education about TB (OR = 8.85; 95% CI = 2.16-36,97), and training DOTS (OR = 5.84; 95% CI = 1.54-26,77) with the invention of a new case in Palu City[5].

## Method

This research using Cross sectional design. The purpose of this research is to analyze the relationship predisposing factors of pulmonary TB staff in Health Centre to achieve the case notification of pulmonary TB through Rapid Moleculer Test with Xpert MTB/RIF and Specimen Transportation methods. This research using cross sectional design and population is all TB staff (34 staffs) in the Health Centres in Deli Serdang District where is each Health centre has 1 TB staff. Data collection is conducted with interviews using pre-tested questionnaires and get approval from the Ethics committee of the Faculty of Nursing Universitas Sumatera Utara. The invention of TB case in Health centre is obtained from secondary data that is calculated by the number of cases of lung TB obtained per Health centre divided by the case target per Health centre. Categorized into: above average if ≥ median and below average if < median. The Mann-Whitney test and Kruskall Wallis were used to see the relationship between the predisposition factor of TB staff with the discovery of TB cases.

## Results

Relationship Characteristic of TB Program with the Notification of Pulmonary TB Through Rapid Moleculer Test and Specimen Transportation Method in the Health Center of Deli Serdang

**Table 1. Relationship Characteristic of TB Program with the Notification of Pulmonary TB Through Rapid Moleculer Test and Specimen Transportation Method in the Health Center of Deli Serdang**

| Characteristic | | Case Finding TB | | | |
|---|---|---|---|---|---|
| | n | % | Mean | SD | p |
| Age | | | | | |

***Cont...*** **Table 1. Relationship Characteristic of TB Program with the Notification of Pulmonary TB Through Rapid Moleculer Test and Specimen Transportation Method in the Health Center of Deli Serdang**

| | | | | | |
|---|---|---|---|---|---|
| <45 years | 13 | 38,2 | 37,46 | 5,77 | 0,649 |
| ≥45 years | 21 | 61,8 | 50,57 | 3,44 | |
| Gender<br>Male<br>Female | <br>3<br>31 | <br>8,8<br>91,2 | <br>0,001<br>0,001 | <br>8,8<br>91,2 | 0,121 |
| Last Education | | | | | |
| SMA | 4 | 11,8 | 1 | 0,001 | 0,153 |
| D-III | 21 | 61,7 | 2 | 0,001 | |
| S1 | 9 | 26,5 | 3 | 0,001 | |
| Long time duty | | | | | |
| <8 years | 11 | 32,4 | 2,53 | 2,42 | 0,359 |
| ≥ 8 years | 23 | 67,6 | 19,21 | 7,58 | |
| Training<br>Never | <br>3 | <br>8,8 | <br>1 | <br>0,001 | 0,832 |
| Ever | 31 | 91,2 | 2 | 0,001 | |

According to the table above the majority of TB cases were found by TB staff aged ≥ 45 years with a total of 21 people (61.8%). Based on the Mann-Whitney test There is no difference between the age of the staff and the notification of the Pulmonary TB ($p > 0.05$). In accordance with the research Widjanarko (2006) indicates that age and gender have no relationship to the notification of the Pulmonary TB[6].

The majority of women's genital female TB staff as much as 31 people (91.2%) And there is no difference between the gender of the officer with the notification of pulmonary TB ($p > 0.05$).

This is in line with the research of Widayat (2006) which suggests that there is no association between the genders of TB staff with the role of health staff in the notification of the case TB[7]

The last education staff of TB D-III as many as 21 people (61.7%). Based on the Kruskall Wallis test, there was no difference between the last education and the notification of a Pulmonary TB ($p > 0.05$). Maryani Research (2015) received a majority of TB staff have a D-III education (66%)[8].

The length of duty of TB staff for ≥ 8 years with the number of 23 people (67.6%). Based on the Mann-Whitney test, the value of $p > 0.05$ is that there is no

difference between the duration of the notification of the Pulmonary TB. The results of the research of Husein (2012) also showed no relationship between long working with the notification of the Pulmonary TB[9].

The notification of Pulmonary TB in Health centre Deli Serdang more than in the staff who have already conducted training compared to the one that has not been, namely the discovery of 31 people (91.2%). Based on the Mann-Whitney test, the *p*-value > 0.05, there is no difference between the experience of training and the notification of pulmonary TB. Rye (2009) states there is a connection between DOTS training and the notification of Pulmonary TB through training provided on staff[5].

Table 2. Relations of Knowledge, Attitudes, Actions of TB Program with the Notification of Pulmonary TB Through the Method of Rapid Moleculer Test and Specimen Transportation in the Health Center of Deli Serdang District

| Variable | Case Finding TB | | | |
|---|---|---|---|---|
| | n | Mean | SD | p |
| Knowledge | | | | |
| Low | 14 | 15,64 | 3,20 | 0,904 |
| High | 20 | 25,70 | 5,06 | |
| Attitudes | | | | |
| Not good | 16 | 32,25 | 3,37 | 0,105 |
| Good | 18 | 38,67 | 1,02 | |
| Action | | | | |
| Not Good | 13 | 4,38 | 0,87 | 0,304 |
| Good | 21 | 6,71 | 0,84 | |

According to the Mann-Whitney test the *p*-value >0.05 i.e. there is no difference between the knowledge of the officer with the invention of the Pulmonary TB.

In comparison with the results of Maryani Research (2015) in Kartasura Health centre which stated that there is a relationship between the level of knowledge of health staff with the role of the case notification TB (Spearman test: $p < 0.05$)[8]. From the results of the study obtained an overview of staff who have an above average attitude score but have a low case notification results. There is no difference between the attitude of the officer and the notification of the pulmonary TB ($p > 0.05$). This is different from the research results of Widjanarko (2006) which indicates that there is a relationship between the attitude of TB staff with the notification of suspect TB[6]. Ratnasari Research (2015) also shows the same results that there is a connection between the attitude of staff with the achievement of staff against case detection rate in the Pulmonary TB program in Rembang District[10-13].

There is no difference between action staff TB with the notification of pulmonary TB ($p > 0.05$).

## Conclusion

There is no difference of predisposing factors with the notification of TB using Rapid Moleculer Test and Specimen Transportation method in Deli Serdang District.

**Acknowledgement:** Thanks to the TALENT Research Institute, the University of North Sumatra who has provided research funds with a contract number: 4167/UN 5.1 R/PPM/2019 dated 01 April 2019.

**Ethical Clearance**- Taken from University ethical committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

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# The Influence of Duration, History of Contact and BMI on the Incidents of Pulmonary TB in patients with DM

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## Abstract

In the world 9.4 million people have been infected with TB disease and each year 1.7 million people die (WHO, 2013). The risk of lung TB increased in patients with DM as a defect in immune cell function and defence mechanism. In addition, it is also determined by the reduced leukocytes in patients with DM, especially for those whose sugar levels are not controlled. The purpose of research is to analyze the duration of DM, contact with TB and BMI on the occurrence of lung TB in patients with DM. Research conducted at the Puskesmas Glugur Darat, Puskesmas Sering and Puskesmas Padang Bulan Selayang in Medan City with a case-control study design. The population of the case is all patients DM with a lung TB recorded in Puskesmas and control is all patients with DM without lung TB. Samples taken with consecutive those are patients with DM who came to the puskesmas during the research until obtained 54 cases and 54 control. Data is analyzed by chi-square test and OR measuring. The results showed that there was influence of contact history of DM sufferers on the incidence of lung TB with OR = 4.38 (95% CI: 1.34-14.33) and BMI with OR = 3.5 (95% CI: 1.52-8.06).

***Keywords:*** *DM patients, duration of DM, contact history, BMI, incidents of lung TB.*

## Introduction

Pulmonary tuberculosis (TB) is an infectious disease as a leading cause of morbidity and death around the world, especially in countries with lower-middle socioeconomics. In the world 9.4 million people have been infected with TB disease and each year 1.7 million people die in the world[1].

The increasing incidence of lung TB in patients with DM is caused by a defect in immune cell function and defence mechanism. In addition, it is also determined by the reduced leukocytes in patients with DM, especially for those whose sugar levels are not controlled.

Some research also shows the impact of DM in lung TB is the treatment of lung TB tends to fail and sufferers tend to die during therapy compared to non DM. Research of Corona et al (2013) states that patients suffering from TB-DM have a more severe clinical manifestation than without DM with OR = 1.8 (95% CI 1.35-2.41), conversion of sputum delayed OR = 1.51 (95% CI 1.09-2.1), higher therapeutic failure OR = 2.93 (1.18-7.23), recurrence Hazard Risk (HR = 1.76 (95% CI 1.11-2.79) and relapse HR = 1.83 (95% CI 1.04-3.23)[2].

Based on Juwatiningsih Research, influential variables increase the risk of lung TB infection in patients with DM is the level of education (OR = 203.84), socio-economic (OR = 3.19), duration of DM (24.35), infectious diseases (OR = 11.14), direct contact with patients with pulmonary TB (OR = 478.31) with $p$-value < 0.05, but the variables of nutritional status, occupation, and knowledge do not show any influence on pulmonary TB infection in patients with DM[3].

According to Siddiqui, et, al, there are age influences ($p < 0.001$), education ($p < 0.003$), marital status ($p < 0.001$) and Weight loss ($p < 0.003$) to the

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risk of pulmonary TB and extra TB Paru[4]. Until now there has been no research explaining the risk of lung TB in patients with DM in puskesmas. Therefore, it is important to know the factors that influence the risk of lung TB in patients with DM.

Research objectives is to analyze the influence of duration of DM, contact history and BMI with lung TB to the occurrence in patients with DM.

## Materials and Method

This research is a longitudinal observational research with case-control design. Cases are patients with DM with lung TB while the control is a patient with DM without lung TB. Population all sufferers of adult DM (≥ 18 years) is recorded in Puskesmas Sering, Glugur Darat, Padang Bulan Selayang. The case population is all patients with lung TB, while the control population is all people with DM without lung TB. Case sample is a person who is DM with lung TB who is following the program of TB which has been recovered and recorded in Puskesmas Sering, Glugur Darat, Padang Bulan Selayang. The control sample size is a DM sufferer who is following the treatment and is listed at the puskesmas. Samples size were calculated based on 90% CI, OR = 3.19, power 1-β = 80%, 1:1 ratio control case, hence the sample of 108 with 54 cases and 54 controls. Samples is taken with consecutive sampling that are patients with DM who come to the health center during the research until the sample is fulfilled. Collecting data using questionnaire that have been test both validity and reliability and have been approved by the Ethics Committee of the Faculty of Nursing at the Universitas Sumatera Utara. Analysis is conducted using the univariate analysis by presenting the frequency distribution data of the proportion of cases and control. Bivariat analysis conducted a chi-square test to assess the degree of significance (p) and calculation of OR to know the magnitude of influence of independent variable with the dependent variable.

## Results

Based on the results of the risk factors obtained pulmonary tuberculosis in patients with Diabetes Mellitus as follows:

**Table 1. Influence Duration of DM sufferers with the Pulmonary TB Incidence**

| Duration of DM (years) | Respondent Status | | | | OR 95%CI) | P |
|---|---|---|---|---|---|---|
| | TB | | Non TB | | | |
| | f | % | F | % | | |
| New (≤3) | 20 | 37 | 16 | 29,6 | 1,40 (0,63-3,12) | 0,540 |
| Old (>3) | 34 | 63 | 38 | 70,4 | | |
| Total | 54 | 100 | 54 | 100 | | |

Based on the table above can be learned that the proportion of respondents who suffer from TB with a DM suffered less than 3 years by 37% and in patients with DM Non TB with less than 3 years of DM suffered by 29.6%. Based on the results of statistical test analysis obtained the *p* value = 0.540 which means there is no prolonged influence suffered DM against the incidence of lung TB. The results of the study Lusiani (2019) which examines the risk factors of lung TB in patients with type 2 DM with a long group suffering from DM 1-10 years and >10 years stated that no old relationship suffers from DM with pulmonary TB incidence in DM sufferer[5]. Although in this research there is no long influence suffered DM against TB event but in the table above can be seen the old proportions suffer >3 years more in cases (63%). This suggests that long-suffering DM can exacerbate the durability of DM sufferers so that it can cause chronic hyperglycaemic due to insulin deficiency either relative or absolute. Weak body endurance in patients with DM coupled with no control of good sugar levels then another chance of a statement attacking in patients with DM tends to be greater.

According to the research of Emma et,al, (2018) patients with TB-lung susceptible to DM, likewise vice versa. The DM incidence rate in TB patients is obtained by 12%. The risk of development of active TB occurs through two processes, starting with initial exposure and infection by Mycobacterium tuberculosis followed by the development of the continiuing disease[6].

**Table 2. Influence of Contact History in DM Sufferes with the Pulmonary TB Incidence**

| **Contact History Of DM Patients** | **Respondent Status** | | | | **OR(95% CI)** | **P** |
|---|---|---|---|---|---|---|
| | **TB** | | **Non TB** | | | |
| | f | % | f | % | | |
| Have | 14 | 25,9 | 4 | 7,4 | 4,38 (1,34-14,33) | 0,020 |
| None | 40 | 74,1 | 50 | 92,6 | | |
| Total | 54 | 100 | 54 | 100 | | |

Based on the table above showed that the proportion of DM respondents who suffer from TB and have a contact history of 25.9% and in groups of DM respondents who do not suffer from TB and have a contact history of 7.4%, based on test analysis obtained $p$=0.02 which means there is influence of contact history of DM sufferers on lung TB events. Obtained OR value = 4.38 (CI: 1.34-14,33) which means that people with DM who have contact history have a risk of 4.38 times greater suffering from lung TB compared with people with DM who do not have contact history. This is in line with the research of Hermiaty et, al which examines the risk factors of TB in type 2 DM sufferers stating that there is a significant influence of pulmonary TB contact history of pulmonary TB incidence in patients with DM type 2 (p = 0,000). Some factor may also affect the severity of the pulmonary TB on patients.[7-10]

**Table 3. Influence of BMI in DM suffers with the Pulmonary TB Incidence**

| BMI | **Respondent Status** | | | | ***OR (95% CI)*** | ***p*** |
|---|---|---|---|---|---|---|
| | **TB** | | **Non TB** | | | |
| | **f** | **%** | **f** | **%** | | |
| Skinny/Normal | 42 | 77,8 | 27 | 50 | 3,50 (1,52-8,06) | 0,005 |
| Fat | 12 | 22,2 | 27 | 50 | | |
| **Total** | **54** | **100** | **54** | 100 | | |

Based on the table above, it can be noted that the proportion of DM respondents who suffer from TB with skinny/normal BMI is 77.8% and DM respondents who do not suffer TB by 50%. Based on the analysis obtained the *p*-value = 0.005 which means there is the influence of DM sufferers with the lung TB incidence and obtained OR value = 3.50 (95% CI: 1.52-8.06). Patients with skinny/normal DM have a risk of 3.50 suffer from TB compared with DM patients with obese BMI. Based on the interviews conducted, patients with TB DM stated that they have fat loss before suffering from lung TB. But after suffering the lung TB their weight decreased drastically which made them have a thin/normal BMI.

## Conclusion

The results showed that there was no influence the duration of suffering DM on pulmonary TB incidence ($p$ = 0.540), and there was an influence of TB contact history of DM sufferers ($p$ = 0,020) and BMI ($p$ = 0,005) with the lung TB incidence.

**Acknowledgement:** Thanks to the Talent Research Institute of Universitas Sumatera Utara who has given the research fund with the contract number: 4167/UN 5.1. R/PPM/2019 dated 01 April 2019

**Ethical Clearance**- Taken from University ethical committee

**Conflict of Interest** – Nil

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# Analysis Relationship of the Pulmonary TB Prisoners with the Prevention Measures in Jail In Province of Sumatera Utara

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## Abstract

According to the WHO (2013), the pulmonary TB as the second order of death and has infected 9.4 million people and killed 1.7 million people in the world each year. Indonesia ranks second highest number of TB cases in the world with an incidence of 391 per 100,000 inhabitants. The prevalence rate of pulmonary TB in prison is estimated to be 3 times higher than the general population. The research aims to analyze the characteristics relationships of the prisoners community with pulmonary TB with precautions and transmission in jails in Sumatera Utara province. The research was conducted in jails in the city of Medan and Lubuk Pakam using cross sectional design. The population is all prisoners with pulmonary TB undergoing treatment. The research sample is all the pulmonary TB sufferers recorded at the both jail clinics. The results showed there was a relationship between the characteristics of prisoners with precautions in ethics of cough (p = 0.01), precautions in habit of throwing sputum (p = 0.046), preventive measures in habit of using masks (p = 0.001) in the jail of Sumatera Utara Province

***Keywords**: Pulmonary TB, jail, preventive measure.*

## Introduction

The incidence of pulmonary TB is still high in society, so that Indonesia still ranks the 2 highest number of sufferers in the world. There are reportedly 1 million cases of pulmonary TB or 399 cases per 100,000 population[1]. Based on a survey of the prevalence of TB 2013 and Global Report 2015 estimated pulmonary TB incident in Sumatra Utara Province in 2017 at 73,488 with incidence rate 515/100,000 and total death of 5,847 with Case Specific Date Rate (CSDR) 41/100,000 inhabitants. Case Detection Rate (CDR) Sumatra Utara Province in 2017 is 37.17%, still 50% under target achievment[2].

The prevalence rate of pulmonary TB in prison is estimated to be 3 times higher than the population of common[3]. Agung Setiadi and Reviono (2016) stated that TB's disease occupies the 4th most common illness and is one of the main causes of pain and death in jail all over Indonesia[4]. The prisoners situation where the exceeds capacity make worse the vulnerability and increase the transmission of pulmonary TB. The research conducted by Sadi at the jail of Narcotics prisoners in Jakarta showed that the implementation of the program has not been effective because it has not been achieved getting to zero case TB.

Research conducted by Rosalina Thuffi and Milla Herdayati (2013) on the risk of TB incidence with Case Control Study at the jail of narcotics in Jakarta in 2013 showed that there was influence of marital status in unmarried groups, education level less than high school, injected drugs use, nutritional status, long prisoners, history of ever held, TB history in family, and the existence of TB in one room with the risk of occurrence of TB[5].

Based on the research of Putri, EA et al (2018) there was an influence of cough behavior on the incidence of pulmonary TB in Semarang Jail ($p$ = 0.022; OR = 3.93; 95% CI: 1.29 -8,44)[6]. Research Chiang CY et al (2002) that from 51,496 prisoners were diagnosed 107 pulmonary TB (258.7 per 100,000 population) where 88 (82.2%) is a new case. This shows the high risk of transmission of pulmonary TB among prisoners in jail[7]. Larouzé B et, al (2015) found that there was an influence of age (≥30 years) on the occurrence of pulmonary TB in the Abidjan prison, Ivory Coast of West Africa (OR =

3.8; 95% CI: 1.1 – 13.3) and a case of pulmonary TB in prison 10 to 44 times higher than common population[8].

The Department of Law and Human Rights report of Sumatera Utara Province said that during the period 2009-2011, the new pulmonary TB case of prison occupants tends to increase every year, the increase was an average of 7.2%. Research of Milla and Rosalina Thuffi's stated that the management of the prison needs to cope with the transmission of pulmonary TB in accordance with the policy and the National Action Plan against the Public Private Mix[5]. Some elements may influence the occurrence transmission of pulmonary TB among communities and to certain people including the management, patient care and nutritional food consumption[9-13]. Based on the background above, it is necessary to do research on the relationship of the pulmonary TB prisoners with the prevention measures in jail in Province of Sumatera Utara

## Method

This research design is cross sectional study. The population is all prisoners with pulmonary TB who are undergoing treatment in jail in Sumatra Utara Province. Samples amounted to 59 prisoners. The Data is done by conducting interviews using questionnaires. Questionnaires were disseminated to respondents after approval from the Faculty of Ethics Committee of the Universitas Sumatera Utara and approval from respondents.

## Results

### Precautions In The Ethics Of Cough

**Table 1. The Relationship of characteristics of prisoner with the ethics of cough pulmonary TB in the Jail of Sumatra Utara Province**

| Characteristics of Prisoners | Ethics Cough | | | | Total | | p |
|---|---|---|---|---|---|---|---|
| | Bad | | Good | | | | |
| | F | % | f | % | f | % | |
| Age | | | | | | | |
| ≤40 yrs | 9 | 30 | 21 | 70 | 30 | 100 | 0,831 |
| >40 yrs | 7 | 24,1 | 22 | 75,9 | 29 | 100 | |
| Last Education | | | | | | | |
| Low | 7 | 24,1 | 22 | 75,9 | 29 | 100 | 0,831 |
| High | 9 | 30 | 21 | 70 | 30 | 100 | |
| Marital Status | | | | | | | |
| Not Marriage | 8 | 32 | 17 | 68 | 25 | 100 | 0,67 |
| Marriage | 8 | 23,5 | 26 | 76,5 | 34 | 100 | |
| Length in jail | | | | | | | |
| ≥ 24 month | 13 | 50 | 13 | 50 | 26 | 100 | 0,01 |
| < 24 month | 3 | 9,1 | 30 | 90,9 | 33 | 100 | |

Based on table 1 It showed that the proportion of patients with a pulmonary TB aged ≤ 40 years have poor cough ethics by not covering the mouth when coughs of 9 people (30%) higher than that of the pulmonary prisoner aged >40 years, 7 people (24.1%). Based on the results of the chi-square test obtained the *p*-value >0.05 which means there is no age relationship with the ethics of cough. The proportion of prisoner with a pulmonary TB who has a low education with a poor cough ethics of 7 people (24.1%) lower than with prisoners with pulmonary TB who has a higher education of 9 people (30%), the test results of the chi-square obtained the *p*-value >0.05 which means there is no last education relationship with the ethics of cough.

Prisoners with pulmonary TB who did not married with poor ethics cough is 8 people (32%) higher than prisoners with married prisoners pulmonary TB, which is 8 people (23.5%). Based on the results of the chi-square test obtained the *p*-value >0.05 which means there is no relationship of marital status with the ethics of cough. The proportion of prisoners with pulmonary TB who stay in jail ≥ 24 month with a poor cough ethics is 13 people (50%) higher than that of prisoners who stay in jail < 24 month for 3 people (9.1%) Chi-Square test results obtained the *p*-value <0.05 which means there is a relationship of length stay in jail with the ethics of cough.

**Throwing Sputum Prevention**

**Table 2 The Relationship characteristic of Prisoner With The Habit of Throwing Sputum in the Jail of Sumatera Utara Province**

| Characteristic Of prisoners | Throwing Sputum | | | Total | | | p |
|---|---|---|---|---|---|---|---|
| | Bad | | Good | | | | |
| | f | % | f | % | F | % | |
| Age | | | | | | | |
| ≤40yrs | 5 | 16,7 | 25 | 83,3 | 30 | 100 | 0,950 |
| >40yrs | 6 | 20,7 | 23 | 79,3 | 29 | 100 | |
| Education | | | | | | | |
| Low | 6 | 20,7 | 23 | 79,3 | 29 | 100 | 0,950 |
| High | 5 | 16,7 | 25 | 83,3 | 30 | 100 | |
| Marital Status | | | | | | | |
| Marriage | 5 | 14,7 | 29 | 85,3 | 34 | 100 | 0,502 |
| No Marriage | 6 | 24,0 | 19 | 76,0 | 25 | 100 | |
| Length in jail | | | | | | | |
| ≥ 24 month | 8 | 30,8 | 18 | 69,2 | 26 | 100 | 0,046 |
| < 24 month | 3 | 9,1 | 30 | 90,9 | 33 | 100 | |

Based on the table known that the proportion of patients with pulmonary TB at age ≤ 40 years that has a habit of poor throwing sputum is 5 people (16.7%) lower than with prisoners with pulmonary TB at the age of > 40 years is 6 people (20.7%). Based on the test Chi Square obtained the *p*-value >0.05 which means there is no

relationship between the age with the habit of throwing sputum. Proportion of prisoners with pulmonary TB who have a low education with a habit of poor throwing sputum (20.7%) higher than that of patients with a pulmonary TB who has a higher education of 5 people (16.7%), the test results of the Chi Square are obtained $p > 0.05$ which means there is no relationship between education and the habit of throwing sputum.

Proportion of prisoners of pulmonary TB who has married the habit of bad throwing sputum is 5 people (14.7%) lower than the proportion of prisoners of pulmonary TB who do not married is 6 people (24%), the results of the Chi square test obtained the *p*-value > 0.05 which means there is no relationship between marital status and the habit of throwing sputum.

Prisoners with a pulmonary TB who has ≥ 24 month in jail have a poor habit in throwing sputum is 8 people (30.8%) higher than the proportion of prisoners pulmonary TB who had been <24 month is 3 people (9.1%), the test results of the Chi square was obtained *p*-value <0.05 which means there is a relationship between the length in jail with the habit of throwing sputum.

## Precautions In Smoking Habits

**Table 3 The Relationship of Characteristics of Prisoners with Smoking Habit in the Jail of Sumatra Utara Province**

| Characteristic of Prisoners | Smoking Habit | | | | Total | | P |
|---|---|---|---|---|---|---|---|
| | No | | Yes | | | | |
| | f | % | f | % | F | % | |
| Age | | | | | | | |
| ≤40yrs | 16 | 53,3 | 14 | 46,7 | 30 | 100 | 0,355 |
| >40yrs | 11 | 37,9 | 18 | 62,1 | 29 | 100 | |
| Education | | | | | | | |
| Low | 14 | 48,3 | 15 | 51,7 | 29 | 100 | 0,905 |
| High | 13 | 43,3 | 17 | 56,7 | 30 | 100 | |
| Marital Status | | | | | | | |
| Marriage | 15 | 44,1 | 19 | 55,9 | 34 | 100 | 0,975 |
| Not Marriage | 12 | 48,0 | 13 | 52,0 | 25 | 100 | |
| Length in jail | | | | | | | |
| ≥ 24 month | 9 | 34,6 | 17 | 65,4 | 26 | 100 | 0,207 |
| < 24 month | 18 | 54,5 | 15 | 45,5 | 33 | 100 | |

According to table 3 the proportion of prisoners with pulmonary TB aged ≤ 40 with smoking habit is 14 people (46.7%) lower than the proportion of the prisoners of pulmonary TB aged >40 years is 18 people (62.1%). Based on the results of the Chi square test obtained the *p*-value >0,355 which means there is no relationship between the age with the habit of smoking.

Prisoners with pulmonary TB who have a low education smoking habit is 15 people (51.7%) lower than the proportion of pulmonary TB who has a higher education of 17 people (56.7%). Based on the results of the Chi square test obtained the *p*-value> 0,905 which means there is no relationship between education and smoking habit.

The proportion of unmarried prisoners with pulmonary TB with a smoking habit is 19 people (55.9%) higher than the proportion of married prisoners of pulmonary TB is 13 people (52%), the test results of Chi Square are obtained the *p*-value >0,975 which means there is no relationship between marital status and smoking habit.

Prisoners with pulmonary TB who has ≥ 24 month in the jail with smoking habit is 17 people (65.4%) higher than the proportion of prisoners with <24 month in the jail is 15 people (45.5%). Based on the results of the Chi square test obtained the *p*-value > 0,207 which means there is no relationship between the length of stay in jail with smoking habit.

**Precautions In Habit Using Masks**

**Table 4 The Relationship of Characteristics of prisoners with the habit of using masks in the Jail of Sumatra Utara Province**

| Characteristic of Prisoners | Using Mask | | | | Total | | P |
|---|---|---|---|---|---|---|---|
| | No | | Yes | | | | |
| | F | % | f | % | F | % | |
| Age | | | | | | | |
| ≤40yrs | 9 | 30 | 21 | 70 | 30 | 100 | 0,831 |
| >40yrs | 7 | 24,1 | 22 | 75,9 | 29 | 100 | |
| Education | | | | | | | |
| Low | 7 | 24,1 | 22 | 75,9 | 30 | 100 | 0,831 |
| High | 9 | 30 | 21 | 70 | 29 | 100 | |
| Marital Status | | | | | | | |
| Marriage | 8 | 23,5 | 26 | 76,5 | 34 | 100 | 0,669 |
| No Marriage | 8 | 32 | 17 | 68 | 25 | 100 | |
| Length in jail | | | | | | | |
| ≥ 24 month | 13 | 50 | 13 | 50 | 26 | 100 | 0,001 |
| < 24 month | 3 | 9,1 | 30 | 90,9 | 33 | 100 | |

Based on table 4 proportion of patients with pulmonary TB at age ≤ 40 years who did not use a mask is 9 people (30.0%) higher than the prison aged > 40 years is 7 people (24.1%). Based on the results of the chi-square test obtained the *p*-value >0.05 which means there is no relationship between age with the habit of using masks.

Prisoners with pulmonary TB in low education who did not use a mask is 7 people (24.1%) lower than prisoners with pulmonary TB who has a higher education is 9 people (30.0%). The test results of the chi-square obtained the *p*-value >0.05 which means there is no relationship between education with the habit of using masks.

The proportion of unmarried prisoners with pulmonary TB with not using a mask is 8 people (23.5%) higher than the proportion of married prisoners of pulmonary TB is 8 people (32%), the test results of Chi Square are obtained the *p*-value >0,975 which means there is no relationship between marital status and using a mask habit. Prisoners with pulmonary TB who has ≥ 24 month in jail have using mask is 13 people (50%) higher than the proportion of prisoners pulmonary TB who had been <24 month is 30 people (90,9%), the test results of the Chi square was obtained *p*-value <0.05 which means there is a relationship between the length in jail with the habit of using a mask.

## Conclusion

There is a relationship between length stay in jail with the cough habit ($p = 0.01$), the habit of throwing sputum ($p = 0.046$), and the habit of wearing masks ($p = 0.001$) in the Jail Sumatra Utara Province.

There is no relationship between age, education, and marital status with the cough habit, the habit of throwing sputum, and the habit of wearing masks in the jail Sumatera Utara Province

**Acknowledgment:** Thank you to the TALENTA Research Institute, Universitas Sumatera Utara for providing the research funding with contract number: 4167 / UN5.1.R / PPM / 2019. April 1, 2019.

**Ethical Clearance**- Taken from University ethical committee

**Conflict of Interest** – Nil

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# The Influence of Distance from Health Facility, Family Number at Home and TB History in Starting Treatment of MDR-TB in Medan

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## Abstract

The national TB Program according to the long-term plan is to prevent and control of drug resistance through Management Program of MDR-TB. The objective of the program are reducing morbidity, mortality and transmission of MDR-TB. Medan is an area with the highest case of MDR-TB in Sumatera Utara Province. Until November 2018 MDR-TB case has been confirmed in the city of Medan as many as 324, which has not started the treatment are 61 patients (19%). This research using case-control design and population is all people with MDR-TB in Medan city that recorded in E-TB Manager data. Sample case is the confirmed MDR-TB person who has not started the treatment as many as 13 people while the control is a confirmed person MDR-TB and willing to start the treatment as many as 31 people. The data is collected through interview using questionnaires and has received approval from the Ethics committee of the Faculty of Nursing University of Sumatera Utara. The data analysis is conducted with the chi-square test and the OR calculation to assess which variables affect the action of beginning MDR-TB treatment. Results showed that there was no influence of the distance of health facilities ($p$ = 0.188) and family number at home ($p$ = 0.507) with the status of starting treatment MDR-TB. There was influence of historical of TB with the status of starting treatment respondent MDR-TB ($p$ = 0.021).

***Keywords:*** *Confirmed MDR-TB, Starting treatment, Distance of health facility, Family number at home, Historical of TB*

## Introduction

National TB Program in accordance with the long-term plan is to prevent and control the transmission of drug resistance through Management Program of MDR-TB. In general, this program aims to reduce the number of morbidity, mortality and transmission of MDR-TB so that it is not a public health problem[1].

Challenges faced in the response of MDR-TB cases from officers ie increased incidence of MDR-TB caused by low number of success of MDR-TB treatment, especially in hospital health services facilities, clinics and private practitioners. Challenges for patients, families and communities, namely low understanding of MDR-TB and its dangers for patients, families and the environment so that many MDR-TB patients refuse to undergo treatment. Infectious pulmonary tuberculosis patients are potentially transmitted to 10 to 15 people annually[2].

Medan is an area with the highest case of MDR-TB in Sumatera Utara province. Until November 2018 MDR-TB case has been confirmed in the city of Medan as many as 324, which has not started the treatment of 61 patients (19%). The rest of the patients who have conducted the treatment of 282 cases (81%), with the status in the treatment is 119 patients (42%), more patients with no status in the treatment (56%). For that

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it is necessary to know the factors that affect MDR-TB patients confirmed to start treatment in Medan city.

## Materials and Method

This research was conducted in the city of Medan. Using the case-control study design is analyzing the factors that affect the start of treatment in TB-RO sufferers in the city of Medan. The population of all TB-RO patients and registered and has an address corresponding to the E-TB manager in the city of Medan. The case is all people with TB-RO who have not started the treatment and can be traced the address based on data in the E-TB manager of Medan City as many as 13 people. Control is all people with MDR-TB who have started treatment and can be traced based on data in the manager of E-TB Kota Medan as many as 31 people. Collection of data using interviews using questionnaires which have been tested and approved by the Ethics Committee of the Faculty of Nursing at the University of North Sumatera. Data is analyzed with Chi-square test for category data and t-independent test for numerical data.

## Results and Discussion

The Influence of Distance from Health Facility with The Starting Treatment of MDR-TB in Medan

**Table 1: The Influence of Distance from Health Facility with The Starting Treatment of MDR-TB in Medan**

| Variable | Treatment Status | | | | p |
|---|---|---|---|---|---|
| | Not yet started | | Already started | | |
| | n | Mean | n | Mean | |
| Distance From Health Facility | 13 | 9,38 | 31 | 12,45 | 0,188 |

Based on the table above, it is obtained that the average distance of residence MDR-TB people who have not started treatment to distance from health facility (9.38 km) lower than those who have started treatment (12.45 km). Based on the test obtained the *p*-value = 0.188 which means there is no influence between the distance from health facility with the status of Treatment MDR-TB. Research in line with Wulandary in Indonesia acquired value P = 0,278 which means there is no meaningful influence between the distance from health facility with health seeking for pulmonary TB[3].

However, it is unlike to G, Cheng et al. in China, indicating that the distance from the health care house significantly affects the delay in drug search[4]. Risks factor of the TB occurrence are differs in any area due to some environmental factors[5,8-13]. Based on the research of Syarifah, et al in Medan, obtained the results of the inconsistency of the address of the person with TB MDR address when registering in RS, this leads to not optimizing the confirmed patients of TB MDR for treatment because the address is unclear[9].

The Influence of Family Number at Home with The Starting Treatment of MDR-TB in Medan

**Table 2: The Influence of Family Number at Home with The Starting Treatment of MDR-TB in Medan**

| Variable | Treatment Status | | | | *p* |
|---|---|---|---|---|---|
| | Not Yet Started | | Already Started | | |
| | n | Mean | n | Mean | |
| Family number at home | 13 | 4,54 | 31 | 5,00 | 0,507 |

According to the table above, it is known that the average number of respondents who have not started the treatment of MDR-TB (4.54) is smaller than the average number of occupants who have initiated the treatment of MDR-TB (5.00) with the *p*-value = 0.507 means there is no influence between the family number at home with the treatment status MDR-TB

Houses that have a high density of housing will be at risk of developing TB disease because the air circulation in the housing with a high density has an effect on the moisture of the house so that the germ Tuberculosis easily develops and It is scattered in the house that is dense[5]. The results of the study differ from the theory, this is because that has not started the treatment nor has started the treatment has the same average density and has an opportunity to be exposed to lung TB.

Effect Of TB History with The Starting Treatment of MDR-TB in Medan

**Table 3: Effect Of TB History with The Starting Treatment of MDR-TB in Medan**

| TB History | Treatment Status | | | | P | OR | 95% CI |
|---|---|---|---|---|---|---|---|
| | Not Yet Started | | Already Started | | | | |
| | n | % | n | % | | | |
| Already | 4 | 30,8 | 21 | 70,0 | 0,016 | 0,21 | 0,067-0,613 |
| Not Ready | 9 | 69,2 | 10 | 30,0 | | | |
| Total | 13 | 100 | 31 | 100 | | | |

According to the table above, the proportion of respondents who have not started treatment 4 people (30.8%) and who have a previous TB history of 21 people (70.0%). This data shows there is a significant influence of TB history with the starting of treatment of MDR-TB patients (OR = 0.21, 95% CI: 0.067 – 0.613).

Non-compliance with treatment is the main cause in treatment failures, relapse, and drug resistance research Nurwanti and Bambang in Puskesmas in the city of Semarang, obtained the *p*-value = 0,005 in the previous treatment status variable, this means that there is an influence of previous treatment status with pulmonary TB events[8]. Supported by Janan Research[7] in Brebes District, in the variable of the treatment history TB obtained the *p*-value = 0.02 which means there is the influence of TB treatment history with the increase in the prevalence of TB MDR cases[7]. According to a latitude research done by the Mekonnen et al., against 124 respondents in West Armchiho District and Ethiopian Metema, a history of TB treatment has a significant relationship to TB MDR events with OR = 7 and *p*-value 0,025[5].

## Conclusion

Results showed that there was no influence of the distance of health facilities (*p* = 0.188) and family number at home (*p* = 0.507) with the status of starting treatment MDR-TB. There was influence of historical of TB with the status of starting treatment respondent MDR-TB (*p* = 0.021).

**Acknowledgment** : Thank you to the TALENT Research Institute, University of North Sumatra for providing Research funding, with contract number: 4167/UN 5.1. R/PPM/2019 April 1, 2019

**Ethical Clearance**- Taken from University ethical committee

**Conflict of Interest** - Nil

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# The Influence of Education, Existence of Sufferers, and Ventilation with TB Incidence in Batak Etnics in Pematang Bandar Health Centre

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## Abstract

Bandar Manis Village is in area of Pematang Bandar Health Centre, with majority population is Batak Ethnics and have a high number of lung cases. This developed as an innovation of health care program for Pulmonary TB response by the name of GEROBAK TIKA (Local Activity of Ethical Cough Behavior) to make the village free of Pulmonary TB. The aims of this research to analyse the influence of education, the existence of sufferers, ventilation with TB incidence in Batak Ethnics people. This research using case-control design, cases are patients with Pulmonary TB and control is people who does not have Pulmonary TB. Sample cases are patients with Pulmonary TB who follow the treatment of TB at Pematang Bandar Health Centre amounted to 43 people and samples of control with the same amount taken from neighbors of nearby sufferers and performed matching of age and sex with analysis of chi-square test. The results showed no educational influence ($p$ = 0,515) and ventilation area ($p$ = 0,596) to Pulmonary TB incidence. There is a significant influence the existence of sufferers with the Pulmonary TB incident in the Batak Etnics in Pematang Bandar Health Centre ($p$ = 0,002) and OR = 9.89 ( 95% CI: 9,89-46,91).

***Keywords:*** *Pulmonary TB, Education, Ventilation, Existence of TB sufferers, Batak Etnics.*

## Introduction

Pulmonary TB is an infectious disease as a leading cause of morbidity and mortality around the world, especially in countries with lower-middle socioeconomics. According to WHO (2013), TB disease as the second sequence of death causes that have infected 9.4 million people and killed 1.7 million people in the world each year. Indonesia ranks second highest with the number of cases in the world's most TB incident, which is 391 per 100,000 inhabitants (WHO, 2017)[1]. Patients with TB disease in North Sumatera province in 2013 recorded as many as 22,627 people[2].

The home environment is one of the contributing factors in the spread of TB. TB germ can live within 1-2 hours to several days depending on the absence of sunlight, good ventilation, humidity, home temperature and the density of home occupancy. Occupancy density is the result of a spacious room with the number of occupants in one house. The size of the house that is not comparable to its occupants will result in high density of home occupancy.

Pulmonary TB disease in Indonesia is an infectious disease on the 2nd rank. One of the areas endemic to the pulmonary TB is North Sumatra with the prevalence rate of 794/1000, incidence rate 515/100,000 and deaths due to Pulmonary TB of 41/100,000 in 2017. In the Bandar Manis Village many people suffer from TB disease as many as 40 people, based on report head of Health Center Pematang Bandar. On August 10, 2018 Pematang Bandar Health Centre was declared the Bandar Manis Village as a TB Village, Bandar Manis Health Centre develops an innovation of Puskesmas program for TB disease under the name of the GEROBAK TIKA (Local Activity of Ethical Cough Behavior) with the aim of making the TB free village.

Most of the villagers of Bandar Manis are Batak people, according to the research of Bintang Y.M Sinaga (2014) indicates that there is a genotyping relationship with the vulnerability to the risk of pulmonary TB incidence there is a BB genotyping relationship compared to bb genotypes with OR = 0.22, (95% CI: 0.11-0.45). Most of the Batak tribes have Bb genotypes.

## Method

This research is conducted in Bandar Manis Village District health Centers of Pematang Bandar because this village is a village where many population suffer from TB and is designated as TB village.

This research is a longitudinal observational research with case-control design. Case is pulmonary TB patients, while the control is not suffering pulmonary TB, 43 samples as cases and 43 samples as controls. Samples of cases is all pulmonary TB sufferers who were having treatment in Pematang Bandar Health Centre. The sample control is taken from the nearest neighbor sample case which does not suffer Pulmonary TB. Data collection is conducted with interviews using questionnaires have tested the validity and reliability, which has been approved by the Ethics Committee of the Faculty of Nursing at the Universitas Sumatera Utara.

## Results

**The Influence of Education with TB Incidence in Batak Etnics in Pematang Bandar Health Centre**

**Table 1. The Influence of Education with TB Incidence in Batak Etnics in Pematang Bandar Health Centre**

| Latest Education | TB Disease | | | | P | OR (95% CI) |
|---|---|---|---|---|---|---|
| | Case | | Control | | | |
| | n | % | n | % | | |
| Low | 26 | 60,5 | 22 | 51,2 | 0,515 | 1,46 (0,62-3,43) |
| High | 17 | 39,5 | 21 | 48,8 | | |
| Total | 43 | 100 | 43 | 100 | | |

Based on the table above, the proportion of the respondents were low educated in the case group as much as 60.5%, this percentage is greater than the control group which is 51.2%. The proportion of sufferers who has a higher education lowered than sufferers in low education with higher educated sufferers this is in line with the theory that bias education affects the incidence of lung. According to Green theory said that education is a major factor in behavioral building. In general the higher a person's education will be have better behavior. But the results of the Chi-square test indicate there is no influence between education and Pulmonary TB ($p > 0.05$).

Research in line with research of Wang X et.,al in Tianjin, China on the risk factors of pulmonary TB from year 2006-2011 acquired *p*-value = 0.61, which means there is no influence level of education with the incidence of Pulmonary TB[3]. The research of Fitriani (2013) in the working area of Ketanggungan Health Centre Semarang obtained the *p*-value = 0.098 which means there is no influence of education with Pulmonary TB events[4].

Influence Existence of Sufferers, with TB Incidence in Batak Etnics in Pematang Bandar Health Centre

**Table 2. Influence Existence of Sufferers, with TB Incidence in Batak Etnics in Pematang Bandar Health Centre**

| Family Members Suffering from TB | TB Disease | | | | p | OR (95% CI) |
|---|---|---|---|---|---|---|
| | Case | | Control | | | |
| | n | % | n | % | | |
| Yes | 14 | 32,6 | 2 | 4,7 | 0,002 | 9,89 (9,89-46,91) |
| No | 29 | 67,4 | 41 | 95,3 | | |
| Total | 43 | 100 | 43 | 100 | | |

Based on the table above, the proportion of respondents who have family members who suffer from previous TB in the case group as much as 32.6%, this number is greater than the control group as much as 4.7%. The results indicate that there is influence of existence of family members who had suffered earlier TB with the incidence of Pulmonary TB in the respondent (*p*-value < 0.05). OR = 9.89 (95% CI :2.09-46,91). Respondents who had family members suffered from pulmonary TB 9.89 times have the risk of pulmonary TB compared to those who did not have family members suffering from pulmonary TB.

This is in line with the research of Budi I, et,al (2018), showed that there is an influence of TB history in the family with the incidence of pulmonary TB ($p$-value = 0.001)[6]. Contact history with sufferers TB affects the incidence of pulmonary TB, this is in line with the Ministry of Health of the Republic of Indonesia where living together continuously with the sufferers of pulmonary TB will spreading the germ to the air in the form of splashes sputum[7].

The degree of transmission of TB in the family environment of the sufferer can transmit to 2-3 people in their home. While the risk of transmission to their neighborhood with the sufferer more than 1 person with TB is 4 times compared to households with only 1 person TB. This occurs because there are TB sufferers in the home and surrounding areas increase the frequency and duration of contact with TB, which is an important factor of TB pathogenesis[8].

Houses that have a high density of housing will be at risk of developing TB disease because the air circulation in the housing with a high density has an effect on the moisture of the house so that the germ Tuberculossis easily develop and scattered in the house that have a high dense of people.

The Influence of Ventilation with TB Incidence in Batak Etnics in Pematang Bandar Health Centre

**Table 3. The Influence of Ventilation with TB Incidence in Batak Etnics in Pematang Bandar Health Centre**

| Variable | TB Disease | | | | p | OR 95% CI |
|---|---|---|---|---|---|---|
| | Case | | Control | | | |
| | n | % | n | % | | |
| Good | 10 | 23,3 | 8 | 18,6 | 0,596 | 1,326 0,47-3,77 |
| Not good | 33 | 76,7 | 35 | 81,4 | | |
| Total | 43 | 100 | 43 | 100 | | |

According to the table above, it can be noted that the ventilation area is good in the respondents case of 23.3% while the respondents control 18.6%, the ventilation area is not good for respondents a case of 76.7% while the control is 81.4%, with the $p$-value = 0,596 which means there is no influence between the area of ventilation with TB disease.

This is in line with the research of Rosiana (2013) in Kedungmundu Health Centre Semarang which means there is no influence between the ventilation area with the occurrence of TB Paru ($p$ = 0,569)[9]. Supported also by the research of Sidiq, N et al (2011) at Somba Opu Health Centre, Sulawesi obtained the value OR = 1,220 (95% CI: 0,35-4,22)[10].

Izzati et al (2015) research in the working area of Andalas Health Centre, the $p$-value = 0,324 which means there is no influence between the area of ventilation with the incidence of TB[11]. Ventilation serves to relieve room air from pathogenic bacteria, good ventilation always occurs continuous flow of air so that the bacteria do not last long in the house[12-14].

## Conclusion

No educational influence ($p$=0.515) and ventilation area ($p$=0.596) with pulmonary TB incidence. There is influence of family members suffering Pulmonary TB with incidence of Pulmonary TB ($p$=0.002).

**Acknowledgment**

Thank you to the TALENTA Research Institute, University of Sumatera Utara for providing the research funding with contract number: 4167 / UN5.1.R / PPM / 2019. April 1st, 2019

Conflict of interest : authors declare no conflict of interest within this study

**Ethical Clearance**- Taken from University Ethical committee

**Conflict of Interest**– Nil

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# Proximate Characteristics and Nutritional Value of White Anchovy Flour

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## Abstract

Low fish consumption in some parts of Indonesia is caused by the high price of several types of fish. Its include types of fish that have a low social value in the community so it is less desirable although their value of nutrients is very good. Anchovy is actually the best source of calcium and protein. Calcium in white anchovy (*Stolephorus sp*) is very stable resistant and not easily soluble in water. White anchovies (*Stolephorus sp*) are excellent as a source of calcium and protein in children who are in their infancy, expectant mothers, nursing mothers and adult women to prevent osteoporosis. When the production volume of white anchovy (*Stolephorus sp*) is increased, making fish flour is a preservation method, It will make the benefits of anchovy can be maximised. White anchovy flour quality can be measured by proximate characteristics and nutritional quality. Proximate parameters in this study are determination of water content, ash content, peroxide numbers, acid numbers, and saponification numbers. Nutritional quality analysis such as carbohydrates, protein, fat, calcium, iron, fiber, zinc, DHA, EPA and trans fat. The characteristics of the proximate are good and meet the quality standards of a food product from fresh anchovy (*Stolephorus sp*) such as fiber content, ash content, number of peroxide and trans fatty acids. The best nutritional quality of fresh anchovy (*Stolephorus sp*) are the content of protein, calcium, iron ,zinc, DHA and EPA.

***Keywords**: Anchovy, Nutritional quality, Proximate characteristics and Stolephorus sp*

## Introduction

Indonesia is a country with excellent natural resources. Indonesia is an archipelago nation with number of waters wider than its land. It provides high production of marine products such as fish. The use of fish as a source of protein has not been optimally fulfilled. At the present time, protein intake is still dominated by vegetable protein about 68.3%, while animal protein has only reached 31.7%. The high intake of vegetable protein during growth has an unfavorable impact, considering the bioavailability of vegetable protein is very low. Animal protein is much better in supporting growth[1].

Anchovy is consumed by the middle to lower classes so it is considered as type of fish that is not popular in the community. Anchovy is actually the best source of calcium that is resistant and does not dissolve easily in water. Anchovy is very good as a source of calcium in children who are growing up, pregnant women, nursing mothers and adult women to prevent osteoporosis[1]. Consumption of small fish provides benefits such as fish bones containing most minerals that can contribute significantly to reducing levels of micronutrients and protein malnutrition[2]. Abbey *et al*[3]stated that consumption of small-sized fish species as a whole can contribute significantly to reducing the level of micronutrient and protein malnutrition.

When the production volume of white anchovy (*Stolephorus sp*) increases, the preservation method is needed, so that the benefits of anchovy can be maximized. One method of preserving fish is making fish flour. Fish flour is a dry solid product produced by removing most of the liquid and some or all of the fat contained in the body of the fish. Fish flour can be made from all types of

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fish, but only pelagic and demersal fish are widely used as raw materials for making fish flour. Anchovy is part of the demersal fish group[4].

Fish flour has many benefits such as easy storage, can be processed into various food products, and has good nutritional value. The process of making anchovy fish into flour causes a change in the proximate characteristics of the product. Proximate analysis is the analysis of components of materials such as water, protein, fat, and ash (minerals)[5]. Analysis of these food components is interesting in the food industry for product development, quality control or regulatory objectives[5,6]. This study aims to determine the proximate characteristics and nutritional quality of anchovy flour (*Stolephorus sp.*)

## Materials and Method

White anchovy fish flour (*Stolephorus sp*) was made in the food technology laboratory of the Department of Nutrition Poltekkes Kemenkes Makassar, fish flour production is refers to Alfianto with modification. White anchovy washed and their head and entrails are disposed. Headless fish and entrails are cleaned squeezed with gauze then soaked in lemon juice 0.2-0.3% for 1 hour, blended, squeezed with gauze, oven dried at 50ºC for 8 hours, and sieved with 60 mesh size. Anchovy flour making is done in three replications.

Parameters in this study are determination of proximate characteristics such as water content, ash content, peroxide numbers, acid numbers, and saponification numbers. Nutritional quality analysis such as carbohydrates (Luff Schoroll), protein (Micro Kjedhal), fat (Soxhlet), calcium (Molumetri), iron (Spectrophotometry) and fiber (Crude Fiber) carried out in the Quality Control Laboratory at SMTI Makassar. Analysis of Zinc levels (18-13-1 / MU / SMM-SIG, ICP OES), DHA (18-6-1 / MU / SMM-SIG, GC), EPA (18-6-1 / MU / SMM-SIG , GC) and trans fat (18-6-1 / MU / SMM-SIG, GC) are carried out at the GIS Laboratory. PT. Saraswanti Indo Genetech Bogor, West Java.

## Results

### Rendement

White anchovy flour was made by obtained the right method to get the highest rendement. This research was conducted with three replications and the results are shown in Table 1.

**Table 1. Rendement of White Anchovy Flour (*Stolephorus sp*)**

| Replications | Fish weight (g) | Edible part weight (g) | Flour weight (g) | Rendement (%) |
|---|---|---|---|---|
| 1 | 5000 | 3750 | 653.25 | 17.42 |
| 2 | 5000 | 3780 | 707.61 | 18.72 |
| 3 | 5000 | 3765 | 717.60 | 19.06 |

Source: Primary Data Research Results, 2019

Table 1 illustrate that the percentage of rendement in each replication of white anchovy flour (*Stolephorus sp*) is different. This is influenced by several factors, for example the treatment factor at the time of sifting. Sifting that carried out carefully resulting higher rendement of flour. The results of this study obtained a mean rendement of 18.40%.

### Proximate Characteristic

The results of the proximate characteristics on white anchovy flour (*Stolephorus sp*) shown in table 2.

**Table 2. Proximate Characteristics of White Anchovy Flour (*Stolephorus sp*)**

| Sample | Fiber (mg) | Water content (%) | Ash content (%) | Peroxide number (mEq) | Acid number (%) | Saponification number (mg/g) | Trans fatty acid |
|---|---|---|---|---|---|---|---|
| 1 | 60.91 | 6.70 | 7.78 | 59.39 | 73.66 | 129.93 | Not detected |
| 2 | 60.90 | 6.06 | 7.74 | 59.23 | 73.57 | 126.83 | Not detected |
| Mean | 60.91 | 6.38 | 7.76 | 59.31 | 73.62 | 126.88 | Not detected |

Source: Primary Data Research Results, 2019

Table 2 gives an overview of the results of the proximate analysis in duplicate for each indicator. The result shows that trans fatty acid is not detected, this shows that the content of trans fatty acids in fresh white anchovy flour (*Stolephorus sp*) was below the minimum limit of the method used <0.02. White anchovy flour (*Stolephorus sp*) can be said have no trans fatty acids or hydrogenated fats.

**Nutritional quality**

This study also carried out analysis of good macronutrients such as carbohydrates, proteins, fats and micronutrients including iron, calcium and zinc. The results can be seen in Table 3.

**Table 3. Nutrient content of fresh white anchovy flour (*Stolephorus sp*)**

| Sample | Carbohydrate (g) | Protein (g) | Fat (g) | Iron (mg) | Calcium (mg) | Zinc (mg) |
|---|---|---|---|---|---|---|
| 1 | 5.73 | 82.967 | 6.04 | 5.817 | 503 | 6.56 |
| 2 | 5.72 | 82.963 | 6.04 | 5.815 | 505 | 6.56 |
| Mean | 5.73 | 82.965 | 6.04 | 5.816 | 504 | 6.56 |

Source: Primary Data Research Results, 2019

Table 3 shows that the protein content of white anchovy flour (*Stolephorus sp*), is very high. Protein content mean valued 82.965% that means each 100 g of flour contains 82.965 gram of protein. In addition, white anchovy flour also contains high calcium which reach 504 mg for every 100 g of flour.

**DHA and EPA**

DHA and EPA are essential fatty acids, especially for children who are growing up. White anchovy flour (*Stolephorus sp*) is also analyzed for DHA and EPA content. The results of the analysis can be seen in Table 4.

**Table 4. The content of essential fatty acids in white anchovy flour (*Stolephorus sp*)**

| Sample | DHA (mg) | EPA (mg) |
|---|---|---|
| 1 | 826.7 | 382.7 |
| 2 | 826.7 | 382.7 |
| Mean | 826.7 | 382.7 |

Source: Primary Data Research Results, 2019

The results of DHA and EPA (essential fatty acids) from white anchovy flour (*Stolephorus sp*) in sequence are 826.7 mg and 382.7 mg in every 100 g.

## Discussion

### Rendement

Rendement analysis in a flour product aims to determine the weight of flour produced from a number of raw materials used. In this study, the ratio between white anchovy flour (*Stolephorus sp*) produced from fresh white anchovy flour (*Stolephorus sp*) was measured. The average yield of rendement reached 18.40%. These results indicate that from 1000 g the weight of fresh anchovy (*Stolephorus sp*) produces 184 g of fresh white anchovy flour (*Stolephorus sp*). The results of this analysis are lower than the catfish head rendement by 26.97% and higher than the body flesh of catfish by 15.70%. This research only use edible part of fish (without head and entrails). The greater bone mass will result in a higher flour rendement[8].

### Proximate Characteristic

Proximate analysis can also provide a reference to the standard substances that must be present in a food product. In addition, proximate analysis can be used to evaluate and develop better food product formulas and evaluate existing food products so that other food ingredients can be added to produce better food products (In this research, proximate analysis includes crude fiber content, water content, ash content, peroxide numbers, acid numbers, saponification numbers, and trans fatty acids[9].

Analysis of fiber content of white anchovy flour (*Stolephorus sp*) showed an average of 60.91 mg. This shows that in 100 g of white anchovy flour (*Stolephorus sp*) contains 6.09 g fiber. This fiber content shows a fairly high level from fish species. Fiber is more commonly found in plants or vegetables and fruits. If the fiber requirement of 1-3 years children is 10 g (Nutritional Adequacy Rate, 2013), then fiber from 100 g of white anchovy flour (*Stolephorus sp*) can meet 60% of their needs. The usage of this fiber must be supported by sufficient fluid consumption, where the average fiber in fish is 70% water soluble[10].

Acid number is a measure of the amount of free fatty acids, the molecular weight of acids. Acid numbers are expressed as the number of milligrams of KOH used to neutralize free fatty acids found in 1 gram of oil or fat. A large acid number indicates a large free fatty acid, derived from oil or fat hydrolysis because of poor food processing. The higher value the acid number indicate lower quality of food products. The results of this study showed the levels of acid from fresh anchovy (*Stolephorus sp*) reached 73.62%. Fish flour production should be carried out by oven drying using low temperature below 50ºC to reduce their acid number. The higher the acid number, the lower the quality of a food product[11].

Trans fatty acids are a type of fat that is not good for health. This fat is classified as a type of unsaturated fat. Trans fatty acids are hydrogenated fats. Hydrogenation is a process of adding hydrogen molecules to a substance. The role and function of trans fat in the body can be obtained at the end of the hydrogenation process which can cause disruption of body function at the cellular level. The results of the analysis of trans fatty acid in white anchovy flour (*Stolephorus sp*) stated no detectability. This shows that the content of trans fatty acids in this flour is declared safe[12].

### Nutritional quality

Carbohydrate analysis results show that white anchovy flour (*Stolephorus sp*) contains 5.73 g carbohydrate from 100 g total ingredients. If we look at the role of carbohydrates as an energy contributor, 100 g of fish flour will produce 22.92 Kcal of energy or fulfill 3-4% of the needs of 11-month-old children as complementary foods for breast milk (MP-ASI). This fulfillment is not a problem considering that white anchovy flour (*Stolephorus sp*) is basically intended for protein sources[13].

The results of protein analysis on white anchovy flour (*Stolephorus sp*) showed an average of 82,965 g. This shows a high protein content that 100 g fish flour containing 82,965 g of protein. The protein content of fish has high quality because fish contain complete amino acids and excellent digestive quality. If the protein needs of 4-6 years children are 40 g, 50 g white anchovy flour (*Stolephorus sp*) is enough to fulfill daily protein needs[14].

The result shows that white anchovy flour (*Stolephorus sp*) in average contains 6.03 g of fat. This shows that in 100 g white anchovy flour (*Stolephorus sp*) only contains 6.03 g fat. Low-fat foods are very necessary in the current era, where changes in activity and eating patterns trigger the emergence of degenerative diseases. The fat content of white anchovy flour (*Stolephorus sp*) only contributes energy by 54.27 Kcal / 100 g product. Low fat content and high protein is food elements that is needed in children who are growing up to avoid obesity[15-20].

**DHA and EPA**

The results of the analysis of DHA content in white anchovy flour (*Stolephorus sp*) in 100 g contain an average of 826.67 mg. The DHA content of white anchovy flour (*Stolephorus sp* is very high so it is appropriate if given to children in the form of complementary foods for breast milk MP-ASI[16].

EPA analysis results on white anchovy flour (*Stolephorus sp*) in average shows 382.7 mg./100 g of flour. The high EPA content in this product shows that the quality of the fatty acids in this product is quite good. However, to maximize the use of EPA and DHA other nutrients needed are Vitamin C, Vitamin $B_6$, Vitamin $B_3$, Zinc, and Magnesium. Because in the process of fatty acid metabolism, especially the conversion of Alpha Linoleic Acid (ALA) to DHA and EPA requires these nutrients. DHA and EPA intake directly from food is very good, but their source is quite expensive. White anchovy flour (*Stolephorus sp*) is an alternative to fulfill both of these nutrients, in addition to being cheap and easy to obtain[17].

## Conclusion

Rendement of white anchovy flour (*Stolephorus sp*) made from their edible parts reaches 18.40%. This flour have good proximate characteristics and fiber, ash content, peroxide numbers, and trans fatty acids meet the quality standards of a food product from white anchovy flour (*Stolephorus sp*). Proximate characteristics that do not meet the quality standards of food products from white anchovy flour (*Stolephorus sp*) are acid numbers and saponification numbers. The best nutritional quality of white anchovy flour (*Stolephorus sp*) is the content of protein, calcium, iron and zinc. The content of carbohydrates and fats can contribute energy of 22.92 Kcal and 54.27 Kcal in every 100 g of white anchovy flour (*Stolephorus sp*). Nutritional quality of essential fatty acids (DHA and EPA) is very high, so it can be used as an alternative to fulfilling the intake of both essential fatty acids that are cheap and easily obtained. The process of making white anchovy flour (*Stolephorus sp*) can be implemented in the industry with advanced technology or carried out by domestic industry with simple technology.

**Ethical Clearance**- Taken from University ethical committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

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# Distribution of RNA M. Leprae Household Contact in Endemic Area Indonesia

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## Abstract

**Background and Objective:** Chronic leprosy disease is caused by the transmission of *Mycobacterium leprae* bacilli, and leprosy is still as an enigmatic disease which is not fully understood. In terms of the national level, leprosy disease in Indonesia remains a public health problem. 16S rRNA gene is a gene that encodes which codes the 16S part of the ribosome and it has specific nucleotides and can specifically be used to detect the cases of leprosy.

**Materials and Method:** This study was classified as the observational study using a case-control research design. The total samples were 81 individuals that consisted of 27 leprosy patients (the case group) and 54 non-leprosy patients (the control group). Analysis of 16S rRNA gene expression was conducted using the RFLP-PCR method to detect the risk of leprosy.

**Results:** All samples of swabs of ear lobes for the case group (27 samples) were definitely positive infected by *M. leprae* and 2 dust samples (7%) collected from houses of the case group showed positive infected by *M. leprae* bacilli, i.e. S05 and S09 respectively. Of all samples of dust collected from houses of non-leprosy patients (the control group), 4 dust samples (14%) was positive infected by *Mycobacterium leprae*, i.e. C03, C05, C09, C11 respectively, and 2 non-leprosy patients were infected by *M. leprae* due to close social interactions with leprosy patients.

**Conclusion:** Dust medium and close social interactions were the causal factors for the transmission of leprosy disease. Therefore, it is suggested to conduct strict control to prevent the widespread of leprosy disease by keeping the cleanliness of houses at the local areas and the surrounding environment as well as the caution to do social interactions with leprosy individuals.

***Key words :*** *leprosy patients,16s rRNA gene, RFLP-PCR*

## Introduction

Leprosy is a chronic disease due to infections by *Mycobacterium leprae* that first attacks peripheral nerves and the upper respiratory tract. Clinical manifestation of the diseases varies greatly with different spectrum between two clinical forms of leprosy and tuberkuloid from lepramatosa.[1]

Although there is a descending trend of new cases, leprosy disease is still considered as a health problem in some countries, including India, Brazil, and Indonesia.[2]

Clinical manifestation of the disease varies widely among individuals. The transmission of *M. leprae* not only consider the cycle of transmission in the form of the source of leprosy disease, contact with the host, but also it is important to consider the source of infection., bacterial virulence, frequency of contacts and the characteristics of the host, including his/her immunity, specific immunity, age, sex and nutritional status and other factors.[3]

16S rRNA gene encodes a ribosomal RNA in a small sub-unit of the ribosome and it has a distinct nucleotide sequence in each bacterium.[5] In addition, 16S

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rRNA gene is more stable and it is suitable to be used a specific molecular marker for the identification[6] of 16S rRNA gene in bacteria (its existence is always retained in any conditions) and has identical characteristics in all organisms.

The 9.1% sequence difference contrasts sharply with the 0.005% difference uncovered by genome sequencing and multi-locus genotyping between M. leprae strains worldwide. To explore whether this novel leprosy pathogen is present in China, we analyzed 171 leprosy skin biopsy tissue samples from patients in different provinces of China by using nested PCR[21]

Based on the problem background as stated above, this study aims to assess the distribution of leprosy disease using the PCR method through the transmission of *M. leprae* at the local settlements by examining samples collected from swabs of leprosy individuals and dust medium and identification of social interactions (household contact) among leprosy patients and non-leprosy patients at the study area.

## Materials and Method

### Samples of the study

The study was classified as population in this study as the observational study using a case-control research design. The population in this study consisted of both the case group and control group. The case group was leprosy patients (BTA+), whereas, the control group was non-leprosy patients in Makassar municipality. Statistical analysis for both the case group and the control group was done using the Lameshow formula.

This study was classified as the observational study in which the authors did not control the assignment of treatments by using a case-control research design where the exposures to risk factors for the case group were compared to exposures for the control group. Samples in this study were leprosy patients (BTA+) and non-leprosy patients (BTA-) in Makassar municipality. The total samples were 81 individuals that consisted of 27 leprosy patients as the case group and 54 non-leprosy patients as the control group.

### Statement of Ethics

All experimental procedures for the treatment of individuals as the samples in this study were reviewed and approved by the Research Ethics Committee of Medicine Faculty, Hasanuddin University

## Results

### Distribution of leprosy disease for both the case group and the control group

Dust medium and close social interactions (household contact) were identified in the distribution of leprosy disease for both the case group to identify the transmission of *Mycobacterium leprae* bacilli. The transmission of *M. leprae* is classified into three categories, i.e. detection of samples of swabs of ear lobes and dust samples from houses for the case group, detection of dust samples collected from houses of non-leprosy patients and examination of infected non-leprosy patients by *M. leprae* due to close social interactions (household contact) with leprosy patients. The three examination categories are shown in the following tables.

**Table 1. Results of examination of *M.leprae* from samples of swabs of ear lobes in a slit skin smear for 27 leprosy patients (BTA +) and dust samples collected from houses of 27 leprosy patients (the case group).**

| No. of Samples | *M. Leprae* in Samples | Swabs of Ear Lobes | Dust Samples |
|---|---|---|---|
| 5 | S05 | Positive (+) | **Positive (+)** |
| 9 | S09 | Positive (+) | **Positive (+)** |

As shown in Table 1, results of examination of *M. leprae* bacilli in swabs of ear lobes of leprosy patients (the case group) from a slit skin smear showed that all leprosy patients were positive infected by *M.leprae*, and there were 2 dust samples (7%) collected from houses for the case group showed positive contained *M.leprae* bacilli, i.e. S05 and S09. Houses of all leprosy patients are commonly next to each other within the average distance of 25 m, whereas, the average distance for other houses are 50 m

**Table 2. Results of examination of *M.leprae* from dust samples collected from houses of non-leprosy patients (household contact).**

| No. of Samples | M. leprae in Dust Samples | Results of Examination |
|---|---|---|
| 3 | C03 | Positive (+) |
| 5 | C05 | Positive (+) |
| 9 | C09 | Positive (+) |
| 11 | C11 | Positive (+) |

Of the 27 dust samples collected from houses of non-leprosy patients in Table 2, 4 dust samples (14%) were positive contained *M. leprae*, i.e. C03, C05, C09, C11 respectively. This incidence was caused by relatively close distance between houses of non-leprosy patients and houses of leprosy patients (household contact) with the average distance of their houses is approximately 20 m.

Analysis of the 16S rRNA gene using the PCR method

Results of PCR amplification and sequencing of 16S rRNA genes in the study samples derived from agarose gel electrophoresis of 16S rRNA genes were shown in the three following figures.

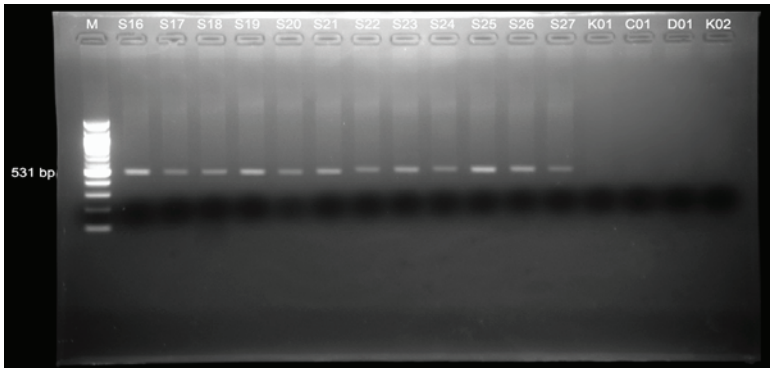


**Figure 1. Results of agarose gel electrophoresis of 16S rRNA genes in the samples of leprosy individuals.**

In Figure 1, results of agarose gel electrophoresis of 16S rRNA genes in the amplification of *Mycobacterium leprae* genes showed positive infection at 531 bp for the samples of S16, S17, S18, S19, S20, S21, S22, S23, S24, S25, S26, S27 respectively.

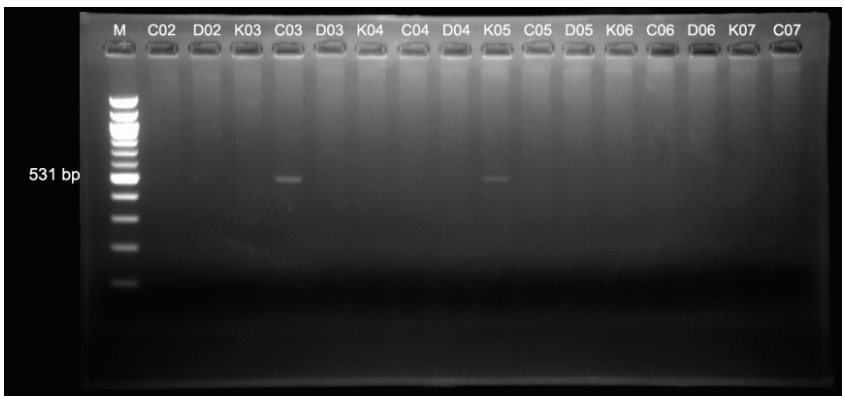


**Figure 2. Results of agarose gel electrophoresis of 16S rRNA genes in dust samples.**

As shown in Figure 2, results of agarose gel electrophoresis of 16S rRNA genes in dust samples collected from houses at 531 bp for the C03 sample, whereas, dust samples for non-leprosy individuals (BTA -) at 531 bp for the K05 sample.

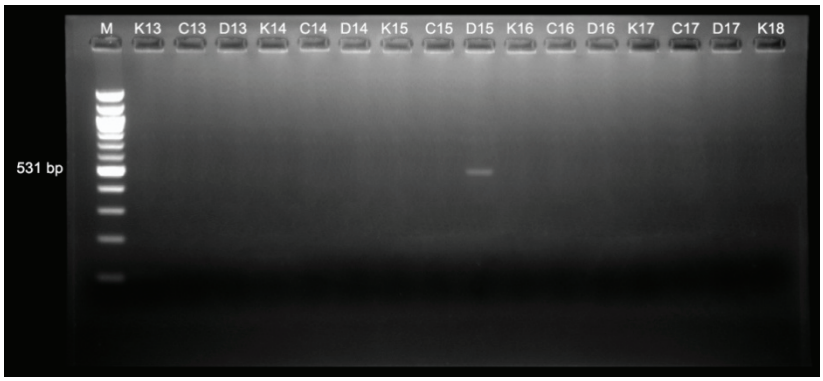


**Figure 3. Results of agarose gel electrophoresis in dust samples that contained *M. Lepra* in the control group infected by *M. leprae.***

In Figure 3, results of agarose gel electrophoresis of 16S rRNA genes for non-leprosy patients (the control group) at 531 bp for the D15 sample.

From the quantitative analysis for all samples, distribution of leprosy disease through the transmission of *M. leprae* based on the examination of dust samples and household contact is shown in Table 4.

**Table 4. Distribution of leprosy disease through the transmission of *M. leprae* in dust samples and household contact.**

| Dust | Leprosy Patients (BTA +) | | Household Contact (HC) | | Household Contact (HHC) | | Total | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Positive | 2 | 7.41 | 4 | 50 | 2 | 25 | 8 | 100 |
| Negative | 25 | 92.59 | 23 | 31.4 | 25 | 34.3 | 73 | 100 |
| Total | 27 | 100 | 27 | 33.3 | 27 | 33.3 | 81 | 100 |

## Discussion

Leprosy is a chronic disease that mainly affects the periphal nerves and skin. It is caused by an acid bacillus *Mycobcaterium leprae* which was first described by Hansen in 1874. Although *Mycobcaterium leprae* was the first agent to be linked to an infectious disease, leprosy is still today as an enigmatic disease which is not fully understood. The contact is not limited to household relationships, but also social relationship[3]

Global standardized guidelines for the diagnosis and treatment of leprosy for the elimination of this disease have been available and the efforst to do prevention of this disease has been practiced for more than 2 decades[9]. Classical epidemiology and leprosy control program

have frequently identified household contacts of patient as objects for higher risk of infections than the general populations,[10,11,4], explanation or tools are not routinely in place for tracing the origins and relationship of these and remaining new cases[12,13,23]

There is no easy quick method for the reliable detection and identification of *M.leprae* in clinical samples. Acid fast staining is a common method to detect *M.leprae* in a slit skin smear, but this method lacks specificity and sensitivity. Although *in vivo* culture of *M.leprae* in mice is a possibility, this methodology is not suited within a large scale. The polymerase chain reaction (PCR) is a novel, quick and reliable method of detecting small number of organisms through the amplification of a species DNA sequences to a detectable level[14]

All leprosy patients (BTA+) analyzed in this study were definitely positive infected by *M. leprae* and 2 dust samples (7%) collected from two houses for the case group showed positive contained *M. leprae* bacilli. They commonly stay at dirty areas. In addition, they have low consciousness on healthy life on how to keep the cleanliness of house and their surrounding environment.

There were 4 dust samples were positive contained *M. leprae* in houses of the non-leprosy patients due to relatively close distance of houses of non-leprosy patients and houses of leprosy patients (household contact). The local communities at the study area always close social relationship in daily activities. Such a social behavior with high interaction intensity increases the risk of transmission of leprosy disease, especially social interactions between leprosy and non-leprosy individuals who live under one house that enhance the transmission of *M.leprae* bacilli.

Most individuals in the category of leprosy have low level income and they stay at unsuitable settlements as the common socioeconomic and cultural problems in several developing countries. Moreover, their houses are witihin a relatively close distance. Social interactions among local families at the study area commonly occur at afternoon as the spare times as observed in their daily activities.

This study is in line with the study conducted by Massi et.al. at the Tukamasea Village Administration.[17] 46 dust samples collected from house in the leprosy endemic area were examined and they found 3 samples (6.52%) were positive infected by *M.leprae,* and MLPA test from 144 person showed 48.6% positive (70 individuals) infected by *M.leprae*, but only 5 individuals (7.1%) indicated positive infected by *M. leprae* who live in houses using the PCR method.

Another study reported the transmission of *M. leprae* from dust collected from houses using the PCR method, but no significant different between IgM antibody titers for individuals with infection of DNA *M.leprae* was positive in dust samples collected from houses and their study supported the transmission of *M.leprae* in endemic area[15]

Several studies show a correlation between higher incidents of leprosy with lower SES[18,19-22]. Individuals in the category of low socioeconomic are 3.35 times more likely having the risk of leprosy disease. Lower SES is also related to low level of education. Illiteracy and low level of education of less than eight years of schooling is associated with the increase of leprosy cases. Low level of education has been reported as the risk factor of leprosy in studies conducted in CE.[16,19]

## Conclusion

Based on results of the analysis 16s rRNA expression using RFLP-PCR, it was concluded that all samples (27 samples) of swabs of ear lobes for the case group were definitely positive infected by *M. leprae* and 2 dust samples (7%) from houses for the case group showed positive contained *M. leprae* bacilli, i.e. S05 and S09 respectively. Of all samples of dust collected from houses of non-leprosy patients (the control group), 4 dust samples (14%) was positive contained *Mycobacterium leprae*, i.e. C03, C05, C09, C11 respectively, and 2 non-leprosy patients were infected by *M. leprae* due to close social interactions (household contact) with leprosy patients. It is suggested to conduct strict control of the distribution of leprosy disease to do preventive measures that include keeping the cleanliness of houses at the local areas and the surrounding environment the caution to do social interactions with leprosy individuals to minimize transmission of *M.leprae* at a wider scale.

**Ethical clearance**- Taken from Faculty ethical committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

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# Analysis of Environmental Risk Factors and Treatment Efforts Malaria Import Patients in Puskesmas in the Work Area of District Health Center of Segeri, Pangkep Regency 2019

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## Abstract

Malaria is transmitted by female Anopheles mosquito bites. Plasmodium carried by mosquito bites will live and multiply in human red blood cells. This study aims to determine the relationship between environmental risk factors and treatment efforts in patients with Imported Malaria in the work area of the District Health Center of Segeri, Pangkep Regency.

This type of research is observational analytic using a case-control design. The sampling technique for case groups is exhaustive sampling. Control group sampling is adjusted based on the number of sample cases as many as 40 cases with a ratio of 1:1 with a total of 80 respondents. Data analysis was performed univariate, bivariate (Chi-square yielded Odds Ratio (OR), and multivariate (logistic regression).

The results of the bivariate analysis showed an association between malaria sufferers in the migration area (p=0.017; OR=3.273), nighttime habits (p=0.025; OR= 2,786), wearing closed clothes (p=0.044; OR=2.500), using mosquito nets at night (p=0.043; OR=2.538), history of suffering from malaria (p=0.029; OR=9.750), knowledge about the causes of malaria (p=0.012; OR=6.333), knowledge about malaria transmission (p=0.027; OR=2.143), knowledge about the clinical symptoms of malara (p=0.029; OR=9.750), knowledge about the type of malaria treatment (p=0.025; OR=3.857), knowledge about malaria prevention (p=0.025; OR=3.857 ), and have attended/heard of malaria counseling (p=0.027; OR=2.143) with imported malaria. Multivariate analysis showed that the most dominant factor associated with imported malaria was the use of mosquito nets in the migration area (Wald = 6.604; Exp. (B) = 5.239; 95% CI 1.481-18.526).

The solution provided is the need to increase awareness of protecting the environment specifically with the use of mosquito nets in the migration area, increasing knowledge of malaria and prevention by counseling and awareness to take chemoprophylaxis for people who want to migrate.

***Keywords*****:** *Environment, Medicine, Import Malaria, Pangkep*

## Introduction

Risk factors for malaria transmission, such as environmental factors, the presence of vectors and uncontrolled Plasmodium can cause malaria to re-emerge. Plasmodium sp can hide in the human body, but does not cause symptoms (carrier). If there are environmental changes that support the development of Anopheles sp, contact will begin and malaria can reappear[1]. Other influential factors are the existence of mosquito breeding sites around the house, the environment inside and outside the house, the habit of going out at night, and the level of knowledge about malaria treatment[2]. That is why eradication of malaria through appropriate treatment needs to be done.

Eradication of malaria through treatment can break the chain of transmission if done properly and correctly. In addition, related to the time of seeking treatment, a delay in treatment can cause death in adults up to 25%

in 2 weeks after the occurrence of primary infection. In addition, the impact of malaria infection and treatment failure can result in anemia, fetal death, prematurity, low birth weight, and high economic loss. Therefore, treatment and treatment need to be done quickly and precisely to reduce morbidity, prevent severe and complications, prevent transmission, and minimize the impact of the disease on public health[2]

Data from the Pangkep District Health Office in 2016, the clinical Malaria number was 202 cases with 53 positive cases (API 0.16 ‰). In 2017 the clinical Malaria number was 145 cases with 65 positive cases (API 0.21 ‰) and in 2018 the number of clinical malaria cases was 52 with 26 positive cases (API 0.11 ‰). One of the Subdistricts in Pangkep Regency that has a high API number of 3 consecutive years is the Segeri Subdistrict with a high import Malaria case found in two villages (Segeri and Baring) each year and is fluctuating, namely in 2016 the API values are respectively 0 , 07 ‰ and 0.56 ‰, increased in 2017 to 0.59 ‰ and 0.70 ‰, and again declined in 2018 with API values 0.39 ‰ and 0.42 ‰[3].

Even though malaria positive cases over the past three years are still categorized as Low Case Incidence with API value <1/1000 population, but it remains a big concern in efforts to eliminate Malaria because it cannot be categorized as a Malaria-free area and almost all sufferers are imported Malaria sufferers who cases continue to be found every year.

## Materials and Method

### Design of Research and Location

Research using quantitative methods, analytic observational design with a case control approach with matching age and gender categories in the control group. Environmental risk factors and treatment efforts in this study are independent variables while imported malaria sufferers are the dependent variable.

### Population and sample

The population of this study were all respondents whose blood preparations were found by Plasmodium based on the results of microscopic examination / Rapid Diagnostic Test (RDT) in the work area of Segeri Puskesmas and Baring Puskesmas that migrated / migrated in the last 3 years 2017-2019. The sample in this study consisted of 40 respondents in the case group namely respondents who were migrants and positive malaria and the control group were respondents who were migrants and negative malaria, with a comparison of case: control samples was 1: 1, so the number of samples was 80 respondents.

### Data analysis

The data analysis technique of this study used univariate analysis, bivariate with Chi Square test resulted in Odds Ratio (OR), and multivariate analysis with logistic regression with Statistical Package for the Social Sciences (SPSS) 21.0 for windows program.

## Results

### *Environmental risk*

Table 1. The results of risk factor analysis of the habit of going out at night show that the p-value of the study was 0.025 (0.025 <0.05) with Odds ratio (OR) = 2.786 with lower limit (LL) = 1.125 and upper limit (UL) = 6,899 indicates a positive relationship between the habit of going out at night in the migration area with imported malaria.

**Table 1. Bivariate Analysis of Environmental Variables on Patients with Imported Malaria in the Work Area of the Segeri District Health Center in Pangkep Regency in 2019**

| Variable | Case | | Control | | Total | | p- Value | OR | 95% CI | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | N | % | | | Lower | Upper |
| Going out at night | | | | | | | | | | |
| Yes | 26 | 65.0 | 16 | 40.0 | 26 | 65.0 | 0,025 | 2.786 | 1.125 | 6.899 |
| No | 14 | 40.0 | 24 | 60.0 | 14 | 40.0 | | | | |

***Cont...*** **Table 1. Bivariate Analysis of Environmental Variables on Patients with Imported Malaria in the Work Area of the Segeri District Health Center in Pangkep Regency in 2019**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Wearing Closed Clothes | | | | | | | | | | |
| Yes | 25 | 62.5 | 16 | 40.0 | 25 | 62.5 | 0,044 | 2.500 | 1.016 | 6.149 |
| No | 15 | 37.5 | 24 | 60.0 | 15 | 37.5 | | | | |
| Wear Mosquito Nets at Night | | | | | | | | | | |
| Yes | 27 | 67.5 | 18 | 45.0 | 27 | 67.5 | 0,043 | 2.538 | 1.023 | 6.298 |
| No | 13 | 32.5 | 22 | 55.0 | 13 | 32.5 | | | | |

Table 1. The results of risk factor analysis using mosquito nets at night show that the p-value of the study was 0.043 (0.044 <0.05) with OR = 2.538 with lower limit (LL) = 1.023 and upper limit (UL) = 6.298 indicating a relationship positive between using mosquito nets at night in the migration area with imported malaria. Respondents who do not use mosquito nets at night have a risk of contracting malaria in the migration area of 2,538 times greater.

***Treatment effort***

Table 2. The results of the analysis of risk factors for history of malaria showed that the p-value of the study was 0.029 (0.029 <0.05) with OR = 9,750 with lower limit (LL) = 1,158 and upper limit (UL) = 82,108 showed a positive relationship between history of having suffered from malaria before migrating with imported malaria. Respondents who have a history of malaria before migrating are at risk of getting malaria in the migration area 9,750 times greater.

**Table 2. Bivariate Analysis of Variable Treatment Efforts to Patients with Imported Malaria in the Work Area of Segeri District Health Center in Pangkep Regency in 2019**

| **Variable** | **Case** | | **Control** | | **Total** | | **p-Value** | **OR** | **95% CI** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **n** | **%** | **n** | **%** | **n** | **%** | | | **Lower** | **Upper** |
| Take Anti-Malaria Medication | | | | | | | | | | |
| Yes | 0 | 0 | 0 | 0 | 0 | 0 | - | - | - | - |
| No | 40 | 100 | 40 | 100.0 | 40 | 100 | | | | |
| History of malaria | | | | | | | | | | |
| Yes | 8 | 20 | 1 | 2.5 | 8 | 20 | 0,029 | 9.750 | 1.158 | 82.108 |
| No | 32 | 80 | 39 | 97.5 | 32 | 80 | | | | |
| Types of Malaria Treatment | | | | | | | | | | |
| Yes | 12 | 30 | 4 | 10 | 12 | 30 | 0,025 | 3.857 | 1.122 | 13.258 |
| No | 28 | 70 | 35 | 90 | 28 | 70 | | | | |

***Cont.*. Table 2. Bivariate Analysis of Variable Treatment Efforts to Patients with Imported Malaria in the Work Area of Segeri District Health Center in Pangkep Regency in 2019**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Prevention of Malaria | | | | | | | | | | |
| Yes | 12 | 30 | 4 | 10 | 12 | 30 | 0,025 | 3.857 | 1.122 | 13.258 |
| No | 28 | 70 | 36 | 90 | 28 | 70 | | | | |
| Follow/ Hear Malaria Counseling | | | | | | | | | | |
| Yes | 0 | 0.0 | 5 | 12.5 | 0 | 0 | 0,027 | 2.143 | 1.682 | 2.729 |
| No | 40 | 100 | 35 | 87.5 | 40 | 100 | | | | |

Table 2. The results of the analysis of risk factors following counseling on malaria indicate that the p-value of the study was 0.027 (0.027 <0.05) with OR = 2.143 with a lower limit value (LL) = 1,682 and upper limit (UL) = 2,729 indicating a positive relationship between having attended / heard of malaria counseling with imported malaria. Respondents who did not attend counseling had a 2,729 times greater risk of malaria.

***Multivariate analysis***

Table 3. Results of Logistic Regression Analysis of Risk Factor Variables with Malaria Patients in the Work Area of the Segeri District Health Center in Pangkep Regency in 2019

| No. | Covariate | B | S.E | Wald | p-value | Exp.(B) |
|---|---|---|---|---|---|---|
| 1. | The Habit of Going Out at Night | 0.657 | 1.577 | 0.174 | 0.677 | 1.930 |
| 2. | Wearing Closed Clothes | 0.129 | 1.558 | 0.007 | 0.934 | 1.138 |
| 3. | Wearing a Mosquito Net | 1.656 | 0.644 | 6.604 | 0.060 | 5.239 |
| 4. | History of Malaria | 0.749 | 1.838 | 0.166 | 0.684 | 0.473 |
| 5. | Knowledge of the Types of Malaria Treatment | 1.108 | 2.093 | 0.280 | 0.597 | 3.027 |
| 6. | Knowledge of Malaria Prevention | 1.380 | 1.649 | 0.701 | 0.403 | 3.976 |
| 7. | Follow / Hear Malaria Counseling | -10.421 | 8035 | 0.000 | 0.999 | 0.000 |

## Discussion

Respondents in this study were 100% using ordinary mosquito nets, not insecticide-treated nets, even though they were living in malaria endemic areas. One of the efforts to prevent malaria transmission is personal protection by reducing contact between humans and vectors, namely interventions to use insecticide-treated mosquito nets[4]. The use of insecticide-treated

mosquito nets in some rural areas has been acceptable to the community, although not all family members use mosquito nets to bedtime continuously[5]

Meanwhile, the p-value in this study for the habit of wearing closed clothing at night was 0.044, which means that there is a relationship between the habit of wearing closed clothing with imported malaria sufferers in the migration area. The use of long-sleeved clothes and long pants when going out outside the house at night is still not a habit for respondents. Not wearing long sleeves and long pants when doing activities outside the house at night is a risk factor for malaria in the Kapoposang Pangkep island area[6]. Respondents said that they were accustomed to not wearing long sleeves and long pants when leaving the house at night, except for certain activities such as recitation and going to the mosque[7,8].

Consumption of anti-malaria drugs or commonly known as chemoprophylaxis in this study 100% or 80 total respondents did not take anti-malaria drugs before migrating. The main reason for respondents is not knowing about this drug and not having time to take it. So it cannot be tested in a bivariate analysis because all respondents' answers are homogeneous. Even though the respondent's response was homogeneous, not taking this anti-malaria drug is a risk factor for imported malaria that deserves attention.

The history of suffering from malaria in this study was interpreted as respondents who had experienced malaria before migrating / to overseas areas. The value of p = 0.012 and OR of 9,750 which means a history of suffering from malaria before migrating is one of the factors of the occurrence of imported malaria. Research by Pratamawati et al.,[9] in the area of Magelang Regency which is a combination of import cases and indigenous cases. The case description is known to be mostly male with age <45 years, as well as most occupations as laborers and all case respondents had experienced malaria before.

Respondents' knowledge in this research is knowledge related to the type of medication and how to prevent malaria. The results of the bivariate analysis showed that the value of each research p-value was 0.025 with a p value <0.05 meaning Ho was rejected, meaning that there was a relationship between knowledge of malaria against imported malaria sufferers. The majority of respondents to the study conducted by Spjeldnæs et al.[10] 82.1% of respondents correctly identified mosquitoes as an infectious agent, mosquito nets as a prevention tool (85.2%) and hospitals according to the needs of care facilities (96.4%). On the other hand, there are conflicting opinions about general malaria symptoms, more than half (58.2%) cite fever as a symptom of malaria, and only one third (32.7%) cite other common symptoms such as headaches, vomiting and body aches. Overall only 17.3% of the total respondents were able to answer correctly.

People who get health education will be well-informed compared to people who have not been provided health education[11]. According to (Notoatmodjo, 2012) knowledge consists of various levels, namely know, understand, application, analysis, synthesis and evaluation. Referring to the theory, it can be concluded that the majority of respondents to this study were only at the level of tofu, against malaria. Knowledge is usually influenced by the level of education[12].

Based on the results of bivariate analysis shows that the research p-value of 0.027 (0.027 <0.05) means that Ho is rejected, meaning that there is a relationship between having attended / heard of malaria counseling by Malaria interpreters at the local health center against imported malaria patients. Then the Odds ratio test value obtained OR value = 2,143 shows that respondents who did not follow / hear counseling about malaria had a risk of getting malaria 2,729 times greater. Respondents in this study 87.5% or the majority never attended or listened to malaria counseling, either at the migration / overseas location or in their place of residence.

Research also conducted by Arisanti et al.,[13] obtained the results of counseling programs on malaria carried out by health workers that have not touched the community, so that in general the public expects counseling to be carried out by health workers that goes on continuously. Based on the results of the analysis of the research questionnaire by Trisnadewi et al.,[14] most respondents did not get information related to the importance of malaria prevention efforts. The low level of knowledge owned by respondents is because respondents have never attended counseling, so the lack of information received by respondents related to the above. The statement is consistent with the theory that the purpose of counseling

is to change unhealthy behaviors into healthy ones. New behaviors that are formed are usually limited to aspects of knowledge, while changes in attitudes and behaviors are indirect effects of counseling[15-16].

## Conclusions

Based on the results of research and discussion, it can be concluded that the environmental risk variables and treatment efforts affect imported malaria patients. The habit of using mosquito nets is the most dominant factor against imported malaria. The solution provided is the need to increase awareness of protecting the environment specifically with the use of mosquito nets in the migration area and awareness of taking chemoprophylaxis for people who want to migrate.

**Source of Funding :** Self

**Ethical Clearance:** obtained from public health faculty ethical committee

**Conflict of Interest :** None

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# Formulation and Effectiveness Test of Matoa Stem (Pometia Pinnata) Skin Extract Cream Combination of Honey on Staphylacoccus Aureus Bacteria

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## Abstract

Matoa (Pometia Pinnata) is a typical Papua fruit plant, classified as a large tree with an average height of 18 meters with a maximum average diameter of 100 cm. Generally bear fruit once a year, flowering in July to October and fruiting 3 or 4 months later. Some research shows that the leaves, fruit bark and matoa tree bark contain tannins, saponins and alkaloids. The purpose of this study was to produce a formulation and test the effectiveness of a cream extract of matoa tree bark (pometia pinnata) honey combination on staphylacoccus aureus bacteria. This research is a purely experimental research to produce an extract of the matoa tree bark cream and then test its effectiveness in the treatment of staphylococcus aureus bacteria, with a completely randomized design (CRD) design. The results showed that the matoa rind extract cream was effective against staphylacoccus aureus bacteria with a significant value of 0.00 <0.005. This study recommends a combination of honey bark stem extract cream for the treatment of staphylococcus aureus bacterial infections.

***Keywords:*** *Matoa, cream, extract and Staphylacoccus Aureus*

## Introduction

Matoa (Pometia pinnata) is a typical Papua fruit plant, classified as a large tree with an average height of 18 meters with a maximum average diameter of 100 cm. Generally bear fruit once a year, flowering in July to October and fruiting 3 or 4 months later[1].

Matoa grow in groups in certain places in the forest. Generally it grows naturally in flat textured soils when it rains a little inundated. In the fruiting season this tree can produce quite a number of fruits and if eaten the fruit tastes sweet so it is often referred to as the matoa fruit tree. Besides producing fruit, leaves, fruit bark and matoa tree bark can be used as medicine[2].

Previous research conducted by Ngajow, Abidjulu, & Kamu,[3] with a concentration of 2 grams of matoa bark extract in 2 mL aquades, showed that the bark of matoa rods had a strong antibacterial effect on Staphylococcus aureus bacteria, each inhibition zone was obtained. 16.84 mm, 12.5 mm and 14.5 mm with positive controls 29.67 mm and negative controls 0 mm. The results obtained are supported by the presence of secondary metabolites phytochemical test results, namely tannins, flavonoids, terpenoids and saponins.

Staphylococcus aureus is a pathogenic bacterium in humans that causes various clinical manifestations. Staphylococcus aureus lives on the skin and nasal membranes with great pathogenic potential to cause various infections[4] It is a gram-positive bacterium with a diameter of 0.7-1.2 μm in diameter, arranged in irregular groups such as grapes, facultative anaerobes, does not form spores, and does not move. More than 90% of clinical isolates produce S. aureus which have polysaccharide capsules or thin membranes that play a role in bacterial virulence.

Honey can help wound healing, because it contains antibacterial and antiseptic effects thanks to the hydrogen peroxide content. In addition, the pH of honey that is

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acidic (between 3.2-4.5) can inhibit bacterial growth. The addition of honey in cream preparations aims to help speed the healing of stapylacocus aures infections and its healing does not cause scars, because honey has anti-inflammatory effects and the ability to disguise scars. Honey accelerates repair of blood vessels (due to damage to blood vessels when injured), helps accelerate the growth of damaged skin layers, increases collagen which is very good to help repair skin, and prevents scars and keloids[5].

The results of a preliminary study conducted by researchers in the community in the city of Sorong on the use of the matoa tree as a medicine, showed that the matoa tree, not yet used as a medicine by him, through this research will be produced formulations cream extracts of the matoa tree bark (pometia pinnata) effective honeybee combination against treatment of staphylacocus aureus bacterial infections.

## Materialsand Method

This research is an in-vitro laboratory experimental study to produce matoa tree bark extract cream preparation and then test its effectiveness on the staphylococcus aureus bacteria, with a completely randomized design (CRD) design.

1. Population and Samples

The population in this study were all staphylococcus aureus bacteria raised in Nutrient Agar (NA) media. Samples are part of the staphylococcus aureus bacteria which are raised in the Nutrient Agar (NA) media. Using a diffusion technique with 3 treatments and 9 repetitions.

2. Materials and Tools

1) Material

The materials used in this study were matoa bark extract, honey bee, glisein, sodium lauryl sulfate, methyl pareben, propyl paraben, cetyl alcohol, propylenglycol, glycerin monostearate, α tocopherol, alcohol, aquadest, nutrient agar, and Staphylococcus aureus and Broth nutrients.

2) Tools

The tools used in this research are mortar, stamper, funnel, porcelain cup, test tube, water bath, measuring cup, Erlenmeyer flask, dropper, cotton, stirring glass, stove, wood clamp, rotary evaporator, vaporizer cup, petri dish, maserator tubes, platinum plates, Beckham pH meters, Rion viscomometers, Memmert incubators.

**3. Data Analysis**

The purpose of data analysis is to test hypothetical: Data analysis of antibacterial activity was carried out by measuring the diameter of inhibitory regions using calipers in each intervention. Then statistical analysis using one-way ANOVA and Tukey's test, using SPSS.

The results of the analysis are concluded:

1) If rvalue ≤ a, Ho is rejected, it means that Matoa Bark Extract Cream combination of honey is effective in staphylococcus aureus bacteria.

2) If rvalue ≥ a, Ho fails to reject, it means that the combination of Madato Stem Matoa Bark Extract Cream is effective in staphylococcus aureus bacteria.

**4. Data Presentation**

## Results

A. **Research Results**

1. Cream Evaluation Results

**Table 1. Evaluation Results of Matoa Stem Bark Extract Cream**

| No | Evaluation Test | Evaluation Formulation Results |
|---|---|---|
| 1 | Organoleptic Test | Light brown color, characteristic odor of matoa tree bark, thick consistency. |
| 2 | Homogeneity Test | Evenly dispersed |
| 3 | PH Test | 4,54 |

**2. KHM Results**

**Table 2. Test Results of Matoa Stem Skin Cream Extract Combination of Honey on Staphylacoccus Aureus Bacteria**

| Bacteria Test | Treatment | Obstacle Zone (mm) | | | | | | | | | Average ± Standard Deviation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | |
| Staphylacoccus Aureus | Cream | 17 | 15 | 18 | 15 | 17 | 17 | 15 | 21 | 15 | 16,67±2,000 |
| | Extract | 17 | 15 | 17 | 17 | 17 | 16 | 18 | 14 | 17 | 16,44±1,236 |
| | Honey | 7 | 7 | 6 | 4 | 6 | 4 | 4 | 5 | 6 | 5,67±1,118 |

Table 2, shows that from nine times the repetition of matoa bark extract cream has an average value of 16, 67, a standard deviation of 2,000. Matoa bark extract has an average value of 16.44, a standard deviation of 1.236 and Honey has an average value of 5.67 and a standard deviation of 1.118.

**3. Data Normality and Homogeneity Test**

Before the bivariate test, the data normality test and test are performed first homogeneity, presented in the following table:

**Table 3. Data Normality Test**

| | Group | Shapiro-Wilk | | |
|---|---|---|---|---|
| | | Statistic | df | Sig. |
| Intervention | Cream | 0,929 | 9 | 0,027 |
| | Extract | 0,839 | 9 | 0,056 |
| | Honey | 0,863 | 9 | 0,102 |

Based on the table above, the three interventions showed a significant value> 0.05, meaning that the data is normally distributed.

**Table 4. Homogeneity Test Results**

| Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|
| 1.184 | 2 | 24 | 0,323 |

Based on the table above shows that a significant value of 0.323> 0.05, means the distribution of homogeneous data, because the data is normally distributed and homogeneous, then it is continued with the parametric statistical test, namely the one-way ANOVA test and the Tukey test.

4. Effectiveness Test of Matoa Stem Bark Extract, Matoa and Honey Stem Bark Extract

**Table 5. ANOVA Test Analysis Results**

| **Intervention** | | | | | |
|---|---|---|---|---|---|
| | **Sum of Squares** | **Df** | **Mean Square** | **F** | **Sig.** |
| Between Groups | 711,630 | 2 | 355,815 | 157.492 | 0,000 |
| Within Groups | 54,222 | 24 | 2,259 | | |
| Total | 765,852 | 26 | | | |

Based on the table above shows that a significant value of 0,000 <0.05, this means that the cream of matoa bark extract, matoa bark extract and honey are effective in inhibiting bacteria.

**Table 6. Similarities and Differences in Intervention Group Average (Post-Hoc Test)**

| **Multiple Comparisons** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Dependent Variable: Intervensi** | | | | | | | |
| | **(I) Group** | **(J) Group** | **Mean Difference (I-J)** | **Std. Error** | **Sig.** | **95% Confidence Interval** | |
| | | | | | | **Lower Bound** | **Upper Bound** |
| Tukey HSD | Cream | Extract | .222 | .709 | .947 | -1.55 | 1.99 |
| | | Honey | 11.000* | .709 | .000 | 9.23 | 12.77 |
| | Extract | Cream | -.222 | .709 | .947 | -1.99 | 1.55 |
| | | Honey | 10.778* | .709 | .000 | 9.01 | 12.55 |
| | Honey | Cream | -11.000* | .709 | .000 | -12.77 | -9.23 |
| | | Extract | -10.778* | .709 | .000 | -12.55 | -9.01 |

Based on the table above, the average difference rate of inhibition of bacteria between cream and extract is 0.222 mm, the lower and upper boundary values are -1.55 to 1.99 with a significant level of 0.947> 0.05, this indicates that there is no difference significant between the extraction of matoa rod bark extract with the matoa bark extract in inhibiting bacteria. While Cream and honey, the average difference rate is 11 mm, the lower and upper limit values are 9.23 to 12.77 with a significant level of 0.00 <0.05, this indicates that there is a significant difference between the bark extract cream creams matoa with honey in inhibiting bacteria.

## Discussion

Matoa bark contains alkaloids, triterpenoids,

steroids, flavonoids, saponins and tannins, which have anti-bacterial properties, from the results of research conducted by Ngajow et al.,[3] about the anti-bacterial influence of extracts of the bark of the stem skin (Pometia Pinnata) against bacteria staphylococcus aureus from three repetitions carried out by the widest bacterial inhibition with an average diameter of 16.84 mm with strong disinfecting properties (susceptible bacteria).

The results of the study were then developed in the form of a honeycomb combination of sunflower bark extract. Cream composition consists of preservative combination of methyl paraben as much as 0.3 g and propyl paraben as much as 0.3 g. The oil phase used is 1.8 ml of glycerin as much as 1 ml of antioxidant α tocopherol as much as 1 ml, and as much as 5 g of cetyl alcohol which is also soluble in the oil phase. Sodium lauryl sulfate as much as 5 grams and propilenglycol as much as 1 gram are the water phases then both phases are heated to a temperature of 65 ° C above the water bath. Then the two phases are put in a stirrer, stirring to form a cream mass. Then propyl and methyl paraben are added to the preparation after first dissolving it in 1 ml of warm water. After a cold base, 1 g of honey is added then the cream is placed in a geometric stirer and stirred until homogeneous and stirring is continued for 15 minutes until the cream is completely homogeneous.

Cream evaluation (Table 1.), shows the results of the organoleptic test of light brown color, the characteristic odor of matoa stem bark with thick consistency. The homogeneity of the uniformly dispersed cream with a pH of 4.54 is safe for the skin, which is between 4.2 - 5.6. The results of the light brown color comes from the skin color of the stem, the thickness due to the thickening agent used is cetyl alcohol. Thickening is a thickener that functions as a binder to the oil phase and water phase associated with Hydrophilic Lipophyll Balance (HLB). Thickening agents or thickening agents are used to regulate the thickness of the product so that it is suitable for the purpose of using the cream and maintain the stability of the product[7].

According to Rowe et al. in Udayana et al.,[7] the concentration of cetyl alcohol for sttifening agents ranged from 2-10%. In this optimization, a concentration of 5% cetyl alcohol is chosen. After the formulation process, the evaluation of the preparations is carried out in order to maintain the quality of the preparations that have been produced. Performed a physical evaluation On the homogeneity test, the results showed that the preparation has good homogeneity because there are no visible particle granules.

After the cream preparation test is carried out, then followed by staphylococcus aureus bacterial inhibition test using a combination of honeycomb stem skin extract, as a control is the extract of matoa bark and honey. The repetition is done nine times for each intervention.

Based on the results of the Analysis of Variance (ANOVA) shows (table 5) that the significance value is 0.00 <0.05. This means that the matoa bark extract cream, matoa bark extract and honey are effective in inhibiting bacteria.

The mechanism of action of flavonoids as antibacterial is to form complex compounds with extracellular protein and dissolved so that it can damage the bacterial cell membrane and followed by the release of intracellular compounds. In addition to playing a role in inhibition of DNA - RNA synthesis by intercalation or hydrogen bonding with a buildup of nucleic acid bases, flavonoids also play a role in inhibiting energy metabolism. This compound will disrupt energy metabolism in a way similar to inhibiting the respiratory system, because it requires sufficient energy for the active absorption of various metabolites and for macromolecular biosynthesis[3].

The terpenoid compounds are also known to be active against bacteria, but the antibacterial mechanism of triterpenoids is still not really known. The terpenoid antibacterial activity is thought to involve membrane breakdown by lipophilic components. In addition, according to[3] phenolic compounds and terpenoids have the main target of cytoplasmic membrane which refers to its hydrophobic nature. The mechanism of action of saponins as an antibacterial is to reduce surface tension resulting in increased cell permeability or leakage and cause intracellular compounds to come out. These compounds diffuse through the outer membrane and cell walls of the vulnerable, then bind to the cytoplasmic membrane and disrupt and reduce that stability.

Similarities and differences in the mean of the intervention group are shown by the results of Tukay's

analysis (Table 6). The average difference rate of bacterial inhibition between cream and extract is 0.222 mm, the lower and upper limit values are -1.55 to 1.99 with a significant level of 0.947> 0.05, this shows that there is no significant difference between extract creams Matoa bark extract with Matoa stem bark in inhibiting bacteria. While Cream and honey, the average difference rate is 11 mm, the lower and upper limit values are 9.23 to 12.77 with a significant level of 0.00 <0.05, this indicates that there is a significant difference between the bark extract cream creams matoa with honey.

The difference in inhibition between cream combination of matoa stem bark combination of honey with matoa bark extract caused by the addition of cream and honey ingredients gives an average difference of 0.222 mm even though the difference is not significant. The strength of the basic ingredients of the bark of the matoa stem, namely alkaloids, triterpenoids, steroids, flavonoids, saponins and tannins, is very dominant in inhibiting the bacterium Staphylococcus aureus.

The difference of inhibitory power between honey and honey matoa stem bark extract cream was 11 mm, showing significant results. Differences in the content of each intervention cause differences in inhibition.

While research conducted by Sulastri & Sari,[7] lauric acid cream preparations tested on staphylococcus aureus bacteria showed antibacterial activity by forming inhibitory diameters for concentrations of 10%, 20% and 30%. The inhibitory diameters were 10.479 mm, 14.8 mm, and 21.589mm, respectively.

The highest inhibitory zone of honey extract combined with honey is in the 8th loop (R 8) of 21 mm (Table 4) when compared with research conducted by Sulastri & Sari,[7] the highest inhibitory zone of lauric acid cream is 21,589 . Although there is a difference of 0.589 mm, but both creams have a very strong inhibition against staphylococcus aureus bacteria. The inhibition zone formed ≥20 mm is considered to have very strong inhibitory activity, 10-20 mm is stated to have strong inhibitory activity, 5-10 mm is stated to have moderate inhibitory activity and ≤ 5 mm is stated to have weak inhibitory activity[9-12].

**Ethical Clearance**: from university ethical committee

**Source of Funding :** This publication was supported by the Health Polytechnic Ministry of Health, Sorong, Indonesia.

**Conflict of Interest** : Nil

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# Relationship between Level of Knowledge of Childbearing Age Women About Cervical Cancer and Behavior of Preventing Cervical Cancer in Mayamuk District, Sorong Regency

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## Abstract

Cervical cancer is the second highest cancer prevalence in women in the world. Cervical cancer usually occurs among women aged 30-50 years. In Indonesia, an estimated 40,000 new cases of cervical cancer each year. Women with cervical cancer mostly late for medical management because lack of knowledge about cervical cancer that resulted in late medical examination.

The research design used was correlational analytic with cross sectional approach. The population was women of childbearing age from 20-35 years old in Mayamuk District, Sorong Regency with a total of 66 respondents who were taken by using total sampling. Data collection instruments used were questionnaires. The data analysis used was Chi Square test with 5% level of significance.

From the research results it is obtained that 41% (27 respondents) have insufficient knowledge, and 55% (36 respondents) have negative behavior. From the analysis with Chi Square test with 5% level of significance it was obtained that the count $X^2$ (20.602)> $X^2$ table (5.99), meaning that there is a relationship between the knowledge of women of childbearing age about cervical cancer with the behavior of preventing cervical cancer in the Mayamuk District, Sorong Regency.

It is expected that health workers will further enhance the provision of counseling to the community and optimize prevention programs against cervical cancer and the community can further enhance their knowledge of early prevention of cervical cancer especially women in childbearing age.

***Keywords:*** *Knowledge of women of childbearing age, cervical cancer, prevention behavior*

## Introduction

Cervical cancer ranks second after breast cancer as the most common cancer suffered by Indonesian women. In Indonesia an estimated 40 thousand new cases of cervical cancer are found each year[1]. Ignorance of the community and low socioeconomic status are the main obstacles for having a check up[2]. In a preliminary study conducted by researchers in the Mayamuk District of Sorong Regency, out of 20 women of childbearing age, there were 16 women (80%) had less knowledge about cervical cancer, 3 women (15%) had fair level of knowledge and only 1 women (5 %) who have good level of knowledge. And out of the 20 women, 9 (45%) have negative behavior in preventing cervical cancer.

This study aims to determine the relationship between the level of knowledge of women of childbearing age about cervical cancer with cervical cancer prevention behavior in Mayamuk District, Sorong Regency in 2014.

## Materials and Method

The study used a correlational analytic design with a cross sectional approach. The population is women of childbearing age aged 20-35 years in Mayamuk District, Sorong Regency with a total of 66 respondents that were chosen using Total Sampling. Data collection instruments using a questionnaire. The data analysis used was Chi Square test with 5% level of significance.

## Results

**A. General data**

**1. Characteristics of Respondents According to Level of Education**

**Table 1 Characteristics of Respondents Based on Level of Education in Mayamuk District, Sorong Regency in 2014**

| No | Level of Education | f | % |
|---|---|---|---|
| 1 | Not Graduate Elementary School | 7 | 11% |
| 2 | Elementary School | 21 | 32% |
| 3 | Junior High School | 18 | 27% |
| 4 | Senior High School | 16 | 24% |
| 5 | Higher Education | 4 | 6% |
| | Total | 66 | 100% |

From table 1, the result shows that out of the 66 respondents, majority of 32% (21 respondents) were elementary school graduate.

**2. The Source of Information about Cervical Cancer**

**Table 2 The Source of Information about Cervical Cancer in Mayamuk District, Sorong Regency in 2014.**

| No | Source of Information | f | % |
|---|---|---|---|
| 1 | Magazine | 2 | 4% |
| 2 | Health Personnel | 40 | 60% |
| 3 | Radio | 0 | 0% |
| 4 | Television | 24 | 36% |
| Total | | 66 | 100% |

From table 2 majority of respondents or 60% (40 respondents) obtain information from health workers.

**B. Special Data**

**1. Characteristics of Respondents Based on Knowledge about Cervical Cancer**

**Table 3 Characteristics of Respondents Based on Level of Knowledge About Cervical Cancer in Mayamuk District, Sorong Regency in 2014**

| No | Level of Knowledge | f | % |
|---|---|---|---|
| 1 | Good | 20 | 30% |
| 2 | Fair | 19 | 29% |
| 3 | Low | 27 | 41% |
| | Total | 66 | 100% |

From table 3, the results show that the majority of respondents or 41% (27 respondents) have low level of knowledge, and lowest presentage or 29% (19 respondents) have fair level of knowledge.

**2. Characteristics of Respondents Based on Behavioral Prevention of Cervical Cancer**

Table 4 Characteristics of Respondents Based on Preventive Behavior of Cervical Cancer in Mayamuk District, Sorong Regency in 2014

**Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 20,602[a] | 2 | ,000 |
| Likelihood Ratio | 22,302 | 2 | ,000 |
| Linear-by-Linear Association | 19,792 | 1 | ,000 |
| N of Valid Cases | 66 | | |

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 8,64.

**Symmetric Measures**

| | | Value | Approx. Sig. |
|---|---|---|---|
| Nominal by Nominal | Contingency Coefficient | ,488 | ,000 |
| N of Valid Cases | | 66 | |

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

| No | Preventive Behavior of Cervical Cancer | f | % |
|---|---|---|---|
| 1 | Positive behavior | 30 | 45 |
| 2 | Negative behavior | 36 | 55 |
| Total | | 66 | 100 |

Based on table 4, it indicates that out of the 66 respondents, the highest percentage or 55% (36 respondents) had negative behaviors towards cervical cancer prevention.

## Data analysis

Table 5 Cross Tabulation of Level of Knowledge of Women of Childbearing Age about Cervical Cancer with Preventive Behavior of Cervical Cancer in Mayamuk District, Sorong Regency in 2014.

| No | Level of Knowledge of Cervival Cancer | Preventive Behavior of Cervical Cancer | | | | Total | |
|---|---|---|---|---|---|---|---|
| | | positive | | negative | | | |
| | | f | % | f | % | f | % |
| 1 | Good | 17 | 25 | 3 | 5 | 20 | 30 |
| 2 | Fair | 8 | 12 | 11 | 17 | 19 | 29 |
| 3 | Low | 5 | 8 | 22 | 33 | 27 | 41 |
| | | 30 | 45 | 36 | 55 | 66 | 100 |

Based on table 5, it shows that out of 20 respondents who had good level of knowledge, 17 respondents had positive behavior and 3 respondents had negative behavior. In the other hand, out of 27 respondents had low level of knowledge, 5 respondents had positive behavior and 22 respondents had negative behavior.

Chi Square statistical test was performed to analyze the relationship of level of knowledge women in childbearing age with cervical cancer prevention behavior at ($\alpha$) = 0.05.

The data analysis resulted the $X^2$ count results obtained = 20.602 and $X^2$ tables = 5.99. Therefore $X^2$ count> $X^2$ table means that there is a relationship between the level of knowledge of childbearing age women about cervical cancer with the preventive behavior of cervical cancer.

## Discussion

From the findings of the research shows that mostly

41% (27 respondents) have low level of knowledge, and 55% (36 respondents) have negative behavior. From the analysis with Chi Square test with 5% level of significance, it was obtained that the count $X^2$ (20.602)> $X^2$ table (5.99), means that there is a relationship between the level of knowledge of women of childbearing age about cervical cancer with the preventive behavior of cervical cancer in the Mayamuk District, Sorong Regency.

In Rogers research[2-4] Notoatmodjo, states that behavior based on knowledge will be more lasting than behavior that is not based on knowledge. Knowledge will affect individual behavior which will further influence community behavior towards healthy promoting behavior. It is especially the knowledge about cervical cancer and its prevention. In addition to knowledge, level of education is also an internal factor that influences one's knowledge and behavior. Higher level of education of the person enable their ability to receive information obtained from various sources such as through magazines, television, radio, and from health workers easier[5-11].

From the results of this study it can be seen that there is no gap between theory and research results. Because the results of the study indicate that the source of information actually affects the knowledge of women of childbearing age who majority of them never obtain information about cervical cancer. Knowledge is also influenced by level of education as supported by finding that majority of them were elementary school graduate[12-15].

While in terms of behavior, women of childbearing age in preventing cervical cancer are mostly having negative behaviors. The cause of this is the lack of knowledge that is not sufficient to support good behavior. Even though they lack knowledge, they are expected not to have negative behavior as well.[16-18]

## Conclusion

There is a relationship between the level of knowledge of women of childbearing age about cervical cancer with the behavior of cervical cancer prevention in Mayamuk District, Sorong Regency in 2014

**Suggestions**

**1. For Respondents**

It is expected that women of childbearing age make the effort to improve their knowledge and information about cervical cancer through various mass media and electronic media (magazines, newspapers, television, etc.) and from health workers, so that they better understand cervical cancer and its prevention.

**2. For Health Agencies**

Information about cervical cancer and its prevention programs must be disseminated more broadly and optimally. Health workers further enhance the provision of counseling to the community and optimize prevention programs against cervical cancer, especially in women of childbearing age.

**3. For the Wider Community**

The public is expected to improve their knowledge more broadly by participating in counseling programs and examinations for early detection of cervical cancer that are given and programmed by the government and health workers.

**Ethical Clearance**: from university ethical committee

**Source of Funding :** This publication was supported by the Health Polytechnic Ministry of Health, Sorong, Indonesia.

**Conflict of Interest** : Nil

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# The Affectivity of Knee and Hip Muscle Strengthening Exercise to Improve Muscle Strength, Balance, Pain, and Functional Activity of People with Osteoarthritis

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## Abstract

**Introduction**. Osteoarthritis is a common condition that affects elderly people, especially knee osteoarthritis. It can cause pain, muscle weakness, imbalance and low functional activity of elderly people. Knee osteoarthritis not only affects muscles in the knee joint area but also those in the hip joint. To improve symptoms of knee osteoarthritis, strengthening exercise is often conducted only on muscles in the knee joint area, but not muscles in the hip area. This study aimed to compare the effect of strengthening exercise conducted in knee joint muscles only with the strengthening exercise in both knee and hip muscles on pain, strength, balance and functional activity.

**Method**. A pre- and posttest design was chosen as the design of this study. Two groups were formed in this study. Group 1 received strengthening exercise on knee joint muscles only and Group 2 received strengthening exercise on knee joint and hip joint muscles. This study was conducted in Prima Physio Clinic for Group 1 and Tajuddin Chalid Hospital, Makassar for Group 2. On each group, there were 10 subjects with osteoarthritis. The strengthening exercise was conducted for 3 times a week for 4 weeks. The outcome measure used was numeric pain rating scale (NPRS), manual muscle strength (MMT), Berg balance scale (BBS) and Western Ontario McMaster (WOMAC). Manual muscle strength was measured in all major muscles of the joints: iliopsoas, gluteus, tensor fascia lata, quadriceps and hamstring.

**Results**. The statistical analysis was conducted using Wilcoxon and Mann Whitney tests. In group 1 analysis, pain, balance, functional activity, and all major muscle strengths were found to be a statistically significant difference between baseline and 4 weeks post-exercise. In group 2 analysis, pain, muscle strength, balance, and functional activity were found to be a statistically significant difference ($p<0.05$). The comparison between the two groups showed statistically significant differences in all muscle group strength except for hamstring. Pain, balance, functional activity and hamstring strength were not statistically significantly different between the groups.

**Conclusion**. From the results, we concluded that the strengthening program for both knee and hip muscles is recommended than only to the affected joint muscles.

***Keywords**: knee osteoarthritis, strengthening exercise, pain, muscle strength, balance, functional activity*

## Introduction

In Indonesia, the prevalence of knee osteoarthritis that appears radiologically reaches 15.5% in men and 12.7% in women aged between 40-60 years. In the knee osteoarthritis, the affected joints are tibiofemoral and patellofemoral joints depending on the severity of the osteoarthritis[1]. Muscle weakness, balance and postural problem can increase the fall risk among osteoarthritis patients. It can be compounded with the loss of proprioceptive sense of the joints. Sufferer loses the sense of joint position and affects balance ability[2].

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According to Geenen et al.[3], osteoarthritis management aims to reduce pain, increase functional activity, and reduce individual and societal costs. According to a meta-analysis by Fransen et al.[4], exercise, advice and education for the management of osteoarthritis symptoms are supported with the highest level of evidence. Research has shown that exercise therapy is effective in improving pain and increasing function of people with osteoarthritis[5].

Research has shown that strengthening exercise can improve muscle strength and increase bone mass[6]. Strengthening exercise on the knee muscles, especially quadriceps, is correlated with the improvement of knee osteoarthritis symptoms. A study showed that quadriceps muscle weakness is common among people with knee osteoarthritis and can become one of the risk factors of knee osteoarthritis[7]. Thus, the quadriceps strengthening exercise becomes the focus of knee osteoarthritis strengthening exercise.

In people with knee osteoarthritis, the addition of hip muscle strengthening exercise to the quadricep strengthening can improve pain, function, walking ability and quality of life compared to quadriceps exercise alone[8]. The previous study showed that the hip and knee exercise group has better improvement of pain and function after 12 weeks of intervention the knee exercise group, especially in patients with patello femoral pain[9]. This study aimed to investigate the effectivity of hip and knee muscle strengthening exercise compared to knee muscle exercise alone in improving function, muscle strength and balance in people with knee osteoarthritis.

According to Kurniawan[10], the limitation of functional activity of people with stroke is caused by the pain the knee joints. When performing daily activities, knee pain can interfere and make the patients limit their activities to avoid pain. This study aims to investigate the effectivity of knee and hip muscle strengthening on muscle strength, balance, pain and functional activity of people with knee osteoarthritis.

## Materials and Method

Subjects were recruited from Prima Physio Clinic and Dr Tadjuddin Chalid Hospital from March to April 2019. A total of 20 patients were enrolled to participate in this study. Patients were eligible to participate if they were diagnosed with primary or secondary unilateral knee osteoarthritis according to clinical and radiological examination and experienced almost daily knee pain. Patients with other medical problems that can interrupt their participation such as cancer and infectious disease were excluded. Upon agreeing to participate, all patients signed informed consent. Participants were then assigned into two groups according to their recruitment sites. Patients in the Dr Tajuddin Chalid Hospital were assigned to group 1 and received knee muscle strengthening exercise. Patients in the Prima Physio Clinic were assigned to group 2 and received knee and hip muscle strengthening exercise. Both groups were given intervention three times a week for 4 weeks.

The intervention was given in the form of muscle strengthening exercises. In group 1, the strengthening exercise was focused on knee joint muscles, m. hamstring and m. quadriceps. The strengthening exercise was conducted by one of the physiotherapists at the study site of group 1. In group 2, in addition to knee joint muscle strengthening exercise, the hip muscles were also targeted including iliopsoas, gluteus and tensor fascia lata. The strengthening exercise was also conducted by one of the physiotherapists at the study site of group 2. All subjects in both groups were received other standard physiotherapy modalities such as infrared heating, interference, transduction electrical nerve stimulation (TENS), taping, and general exercise.

The outcome measure used was MMT, BBS, NPRS, and WOMAC to measure muscle strength, balance, pain, and functional activity respectively. All measurement was conducted by one of the authors (NTP) who had been trained in using the measurement tools. The measurement was conducted at the Prima Physio Clinic for both groups. The persons who perform the measurement was not aware of the subject assignment as the subjects were told not to reveal their groups, received intervention or study site during measurement. The same person measures all variables and in both groups, at baseline and posttest.

Wilcoxon test was used to compare the pre and posttest in each group. Mann Whitney test was used to compare the difference between groups. Statistical significance was set to 0.05. Ethical approval for this study was obtained from the Ethics Committee of Health Research, Hasanuddin University Makassar.

## Results

**Table 1. General characteristics of subjects**

| **Characteristic of Samples** | | **Group 1** | **Group 2** |
|---|---|---|---|
| Gender | Male<br>Female | 5<br>5 | 4<br>6 |
| Age | 41-50<br>51-60<br>61-70<br>71-80 | 1<br>2<br>3<br>4 | 4<br>2<br>2<br>2 |
| Weight | 44-53<br>54-62<br>63-73<br>74-84 | 2<br>3<br>3<br>2 | 2<br>4<br>4<br>- |
| Height | 145-155<br>156-166<br>167-177 | 4<br>2<br>4 | 4<br>5<br>1 |
| Body Mass Index | Ideal<br>Overweight<br>Pre-obesity | 4<br>-<br>6 | 6<br>1<br>3 |

Table 1 shows that the proportion of female and male is similar in both groups. Most subjects are more than 60 years old in both groups. The proportion of the Body Mass Index is relatively even in both groups between ideal and pre-obesity.

**Table 2. Effect of the knee and hip muscle strengthening exercise on the improvement of muscle strength, balance, pain and functional activity**

| **Variables** | **Group 1** | | | **Group 2** | | |
|---|---|---|---|---|---|---|
| | **Pretest** | **Posttest** | **P*** | **Pretest** | **Posttest** | **P*** |
| MMT | | | | | | |
| m. Quadriceps | 3 | 4 | 0.002 | 3 | 5 | 0.004 |
| m. Hamstring | 3 | 4 | 0.002 | 3 | 5 | 0.004 |
| m. Iliopsoas | 3 | 4 | 0.046 | 3 | 5 | 0.006 |
| m. Gluteus | 3 | 4 | 0.046 | 3 | 5 | 0.004 |
| m. Tensor fascia latae | 3 | 4 | 0.046 | 3 | 5 | 0.006 |
| BBS | 19.20±6.663 | 22.40±5.542 | 0.007 | 20.60±7.321 | 25.30±3.620 | 0.000 |
| NPRS | 7.00±1.49 | 5.10±1.59 | 0.000 | 7.30±1.25 | 3.60±2.01 | 0.000 |
| WOMAC | 66.30±11.52 | 53.80±12.13 | 0.000 | 71.10±1.25 | 36.60±16.39 | 0.000 |

*Wilcoxon test

Table 2 shows that muscle strength in all muscle groups around the hip and knee is improved after the intervention given in both groups. The balance, pain, and functional ability are also improved significantly at the posttest.

**Table 3. Differences in the effects between groups on the improvement of muscle strength, balance, pain and functional activity.**

| Variables | Group 1 | Group 2 | P* |
|---|---|---|---|
| MMT | | | |
| m. Quadricep | 8.50 | 12.50 | 0.029 |
| m. Hamstring | 9.00 | 12.00 | 0.067 |
| m. Iliopsoas | 7.00 | 14.00 | 0.005 |
| m. Gluteus | 6.70 | 14.30 | 0.002 |
| m. Tensor fascia latae | 6.50 | 14.50 | 0.001 |
| BBS | 10.10 | 10.90 | 0.578 |
| NPRS | 1.90 | 3.70 | 0.519 |
| WOMAC | 12.50 | 34.50 | 0.393 |

*Mann-Whitney test

Table 3 shows that there is a significant difference in the strength of quadriceps, iliopsoas, gluteus and tensor fascia lata muscles between the groups ($p<0.05$). Higher results can be observed in group 2 compared to group 1. Only one muscle group that shows no significant difference between the groups, m. hamstring. However, the higher result can also be observed in group 2 compared to group 1. There were no significant differences between the groups in terms of balance, pain, and functional activity.

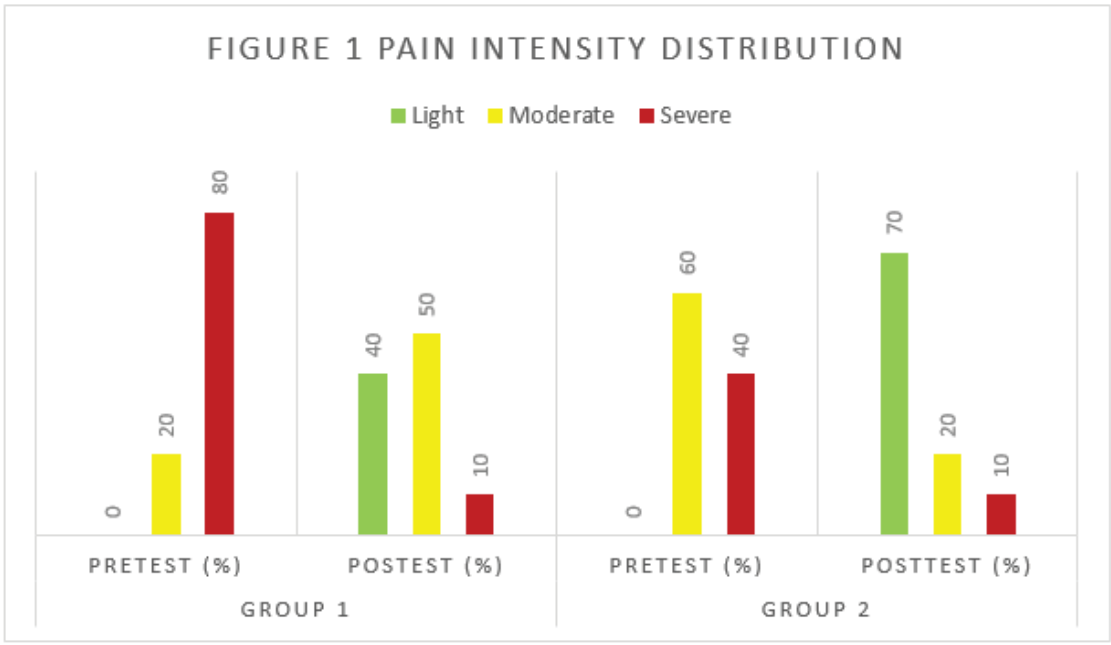
Figure 1 shows that the pain intensity at posttest is improved compared to that at baseline. At baseline, 80% of subjects in group 1 are in severe pain, while 60% of group 2 is in moderate pain. At posttest, 50% of group 1 are in moderate pain compared to 70% of group 2 are in light pain. This result shows that knee and hip muscle strengthening combination is better in improving pain compared to knee muscle strengthening alone.

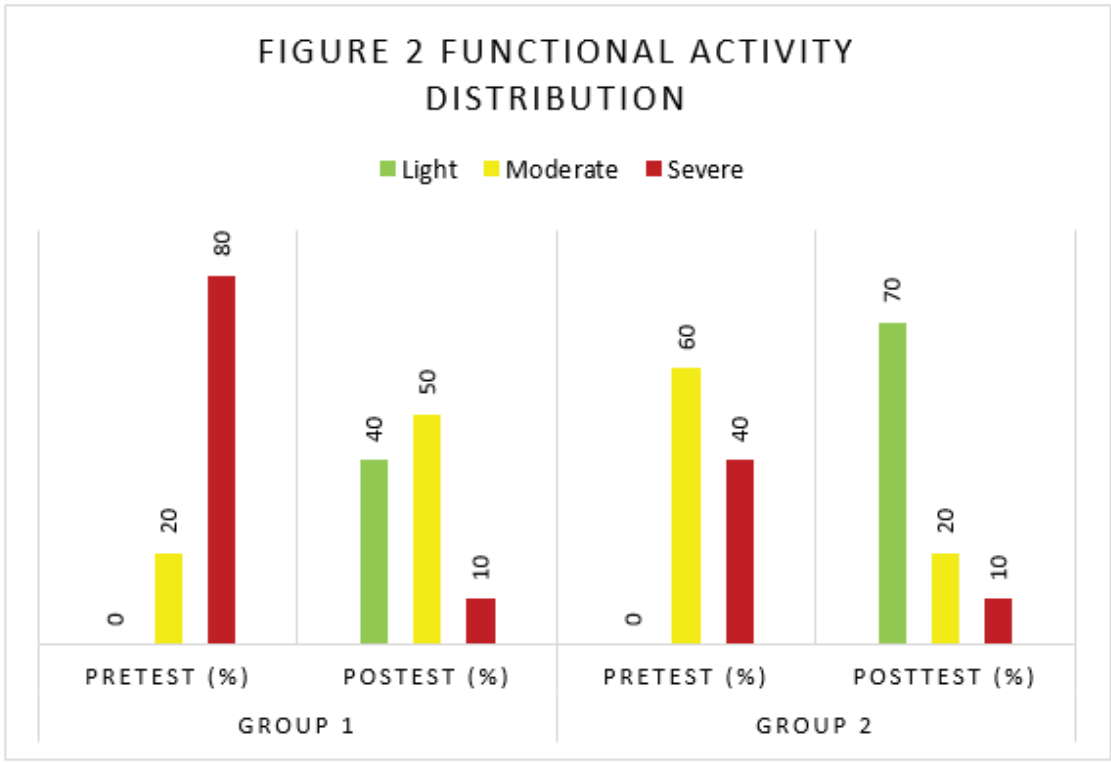
Figure 2 shows the improvement of functional activity in both groups. At baseline, 80% of subjects in group 1 are in heavily dependent compared to 60% of subjects of group 2 are in moderate dependent. At posttest, 50% of subjects in group 1 are in moderate dependent compared to 70% of subjects in group 2 are in light-dependent. This result shows that the combination of knee and hip muscle-strengthening exercise is better in improving functional activity compared to knee muscle strengthening exercise alone.

**Table 4. The correlation between pain and functional activity**

| | Variable | P | Correlation Coefficient |
|---|---|---|---|
| Pre-test | Pain and functional activity | 0.000 | 0.974 |
| Post-test | | 0.000 | 0.841 |

Table 4 shows that there is a statistically significant correlation ($p<0.05$) between pain and functional activity in people with osteoarthritis. The positive correlation was shown in both pretest and posttest measurement of pain and functional activity. According to the correlation coefficient, the correlation is stronger at pretest compared to posttest (0.974 vs. 0.841).



## Discussion

### Strength

The result of this study shows that strengthening hip and knee muscle can improve muscle strengthening significantly. This effect can be explained that the exercise provides neuromuscular adaptation in the long term. Physiologically, the improvement of muscle strength depends on motor unit recruitment. In several weeks of exercise, most of the adoption involves the ability to recruit motor unit that leads to contraction of muscle fibre. As a response to strengthening exercise, neuron activity increase and make actin and myosin number in the muscle fibre also increases. This led to an increase in myofibril hypertrophy and lead to an increase in muscle strength[7].

This study showed that there is a significant difference in muscle strength between the groups except for m. hamstring. Both m. quadriceps and m. hamstring are knee muscles and was given strengthening exercise in both groups, but only quadriceps showed a significant difference. This means that the additional exercise on hip muscles may affect the quadriceps, but not m. hamstring.

### Balance

This study showed that knee and hip muscle exercise can improve balance in people with knee osteoarthritis. Hall[11] stated that during muscle contraction, protein synthesis of muscle contractile is faster than its disintegration, which leads to a progressive increase of actin and myosin number inside myofibril. Moreover, the myofibril is multiplying in each muscle fibre to form myofibril hypertrophy. Inside the hypertrophic muscle fibres, the component of the phosphor metabolic system increase, including the ATP and phosphocreatine[13].

### Pain

This study showed that knee and hip muscle strengthening can improve pain. This result is supported by some previous studies. A study by Kus and Yeldan[12] show that the strengthening focused on m. quadriceps femoris can reduce pain and improve functional activity in people with knee osteoarthritis. A study by K. L. Bennell et al.[14] shows that strengthening of adductor and abductor hip muscles for 12 weeks can improve strength, pain, and function in people with medial knee osteoarthritis. A systematic review by Kus and Yeldan[12] shows that quadriceps muscle strengthening has a positive effect in improving pain and function in people with knee osteoarthritis compared to other treatments that are not included quadriceps muscle strengthening.

### Functional Activity

This study shows that the functional activity of subjects was improved after the application of knee and hip muscle strengthening on people with osteoarthritis. The statistical tests showed that no significant difference in both groups in terms of functional activity improvement. The functional activity in both groups was improved significantly. This can be attributed to the effect of knee and hip muscle strengthening exercise in improving muscle weakness. During repeated exercise, the muscles become hypertrophy and the myofibril increase.

## Conclusion

This study shows that the muscle strengthening on both knee and hip muscles is beneficial in people with knee osteoarthritis in terms of muscle strength, balance, pain, and functional activity. The positive benefit is better showed in the strengthening of muscles in both joints compared to only focus on muscles around affected joints.

**Conflict of Interest-** The authors certify that they have no affiliation with an organization that may benefit financially or non-financially from the subject discussed in this study. This study is self-funded.

**Ethical Clearance-** Taken from Hasanuddin University ethical committee

**Source of Funding-** Self

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# Quinone Oxidoreductase 2 Serum Level that affecting the Psychotic Disorders of Methamphetamine Abusers

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## Abstract

**Background**: Some evidence suggests that genetic factors contribute to susceptibility to drug abuse such as methamphetamin and that dopamine-quinone produced by dopamine might be involved in the mechanism of symptoms associated with psychotic methamphetamine (MAP). Quinone detoxification is catalyzed by a group of proteins, namely quinone oxidoreductase (NQO). In this study we analyzed serum NQO2 levels by examining ELISA Sandwich in clients who used methamphetamine. **Methods:** This research is a Case-Control to determine the contribution of NQO2 to the emergence of psychotic disorders due to methamphetamine abuse. The case group is residents who consume methamphetamine with psychotic characteristics, while the control group is clients who consume methamphetamine without psychotic characteristics **Results:** The mean value of NQO2 gene protein in the Elisa Sandwich examination for the case group was lower than the value of the control group (1,246 < 3,657). The t test showed the value of sig (Equal variances not assumed) = 0,000 that value is less than 0.05 (<0.05), this shows the difference in the value of content protein NQO2 between the case group and the control group. Then the cut-off point of the Receiver Operating Characteristic (ROC) curve in this study is recommended statistically between 1,960 and 2,165, meaning that if the expression value of protein content > 2.165 then the potential for psychotic suffering is great, on the other hand if < 1.960, the potential is small for suffering from psychotics**.** **Conclusion:** The protein content of the NQO2 gene in the Elisa Sandwich examination between the case and control groups is different, the case group is lower than the control. While the CURVE ROC (Receiver Operating Characteristic) Cut-Off value is recommended statistically between 1,960 and 2,165.

***Keywords:*** *Methamphetamine, Dopamine, NQO2 serum level, Methamphetamine Psychotic.*

## Introduction

Recently, methamphetamine abuse has become a major problem and developed into an international problem[20]. According to the *United Nations Office on Drugs and Crime* (UNODC), methamphetamine is a dangerous substances and the 2nd ranks after hashish/ cannabis in the 1st rank of the 20 types of substances that are often misused[19]. The prevalence of narcotics abuse in the world from 2006 to 2013 has increased[19]. In the last five years, the trend of amphetamine type has declined by around 15% in various countries, while the use of ecstasy has been reported to be stable (12). However, there has been a drastic increase (158%) in the last five years namely the consumption of methamphetamine[14,19,20]. Methamphetamine abusers can also cause psychotic symptoms similar to schizophrenia (Schizophrenia-like psychosis) but there are also methamphetamine abusers who do not experience psychotic symptoms[24,25]. As a reference from several previous studies that contributed to our research, there are two sources of reference that we can point out, namely:

*a. Functional polymorphisms of the NQO2 gene is associated with methamphetamine psychosis. (Ohgake, S. at all,*[14,17].

*b. Cognitive impairment is related to oxidative stress and chemokine levels in first psychotic episodes. (Martínez-Cengotitabengoa M at all, Schizophr Res 2012, 137:66–72*).

## Material and Method

### Study Design and Subject

This research is a case-control to determine the effect of NQO2 gene on the onset of psychotic symptoms due to methamphetamine abuse[1,22]**.** The Selection Criteria for clients who only consume methamphetamine with a diagnosis of Behavioral Mental Disorders due to the use of methamphetamine addictive substances with psychotic characteristics for the case group, while those who do not have psychotic characteristics as a control group and are currently undergoing inpatient rehabilitation programs at the BNN Baddoka Rehabilitation Center. Inclusion Criteria: Methamphetamine abusers, aged 20 - 50 years old, qualify as methamphetamine abuse. Exclusion Criteria: Clients suffering from Mental Disorders and Behavior due to addictive substances other than methamphetamine. There is a history of hereditary disorders in the Psychotic group, suffering from Severe Physical Disease and consumption of polysubstance during the past year[9,13].

**Population of Research:** a. Case group: Methamphetamine users have Psychotic disorders, after being examined with the criteria of the Brief Psychiatric Rating Scale (BPRS) and the Diagnostic And Statistical Manual of Mental Disorder (DSM V).

b. Control group: Methamphetamine type who do not experience Psychotic disorders (examination instruments also with BPRS and DSM V).

### 2.3 Statistical Analysis

Analysis of the data in this study (Elisa's protein content) using statistical application assistance, IBM SPSS version 24. To see the difference between the two samples, namely the case group and the control group, an independent t test was performed. Then to determine the cut-off point between psychotic and non-psychotic (Specificity and Sensitivity), by Receiver Operational Characteristics Curve (ROC) test and then performed AUC test (Area Under Curve) so that cut-off from data obtained in both groups.

## Results

**Table 1. Characteristic of subject based on age and gender**

| **Distribution of case subjects (n = 30)** | | | **Distribution of control subjects (n = 30)** | | |
|---|---|---|---|---|---|
| Ages | n | % | Ages | n | % |
| 20-35 yrs<br>36-50 yrs | 27<br>3 | 90<br>10 | 20-35 yrs<br>36-50 yrs | 27<br>3 | 90<br>10 |
| Gender | | | Gender | | |
| Men<br>Women | 29<br>1 | 96,7<br>3 | Men<br>Women | 30<br>0 | 100<br>0 |

Table 1 shows that the age of the subjects in the case group ranged from 20-35 years (90%), most of the men were 29 (96.7%), and the rest were women.

**T-Test**

Independent t test is a test to see the difference between the two sample groups, namely cases and controls.

The mean value of Elisa protein levels in the case group (1,246) is smaller than the control group (3,657).

**Table 2. Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| Content Sandwich Elisa | Equal variances assumed | 10,668 | ,002 | 12,144 | 58 | ,000 | 2,41100 | ,19853 | 2,01359 | 2,80841 |
| | Equal variances not assumed | | | 12,144 | 49,684 | ,000 | 2,41100 | ,19853 | 2,01217 | 2,80983 |

The result of *t-test* showed the sig. value of 0.000 was less than 0.05 (< 0.05). It shows that $H_0$ rejected and $H_a$ accepted, meaning that there were significant differences between case and control groups.

**ROC (Receiver Operating Characteristic) KURVE**

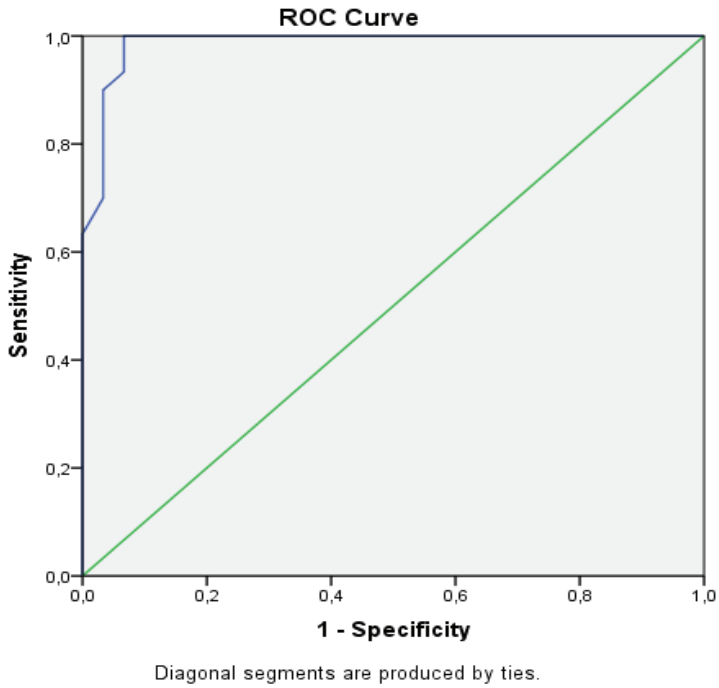


**Figure 1. ROC Curves in Case Control Groups**

The ROC (Receiver Operating Characteristic) curve shows that the value is far from the 50% line and close to 100%.

**Table 3. Area Under the Curve**

**Test Result Variable(s): PROTEIN LEVELS SANDWICH ELISA**

| Area | Std. Errora | Asymptotic Sig.b | Asymptotic 95% Confidence Interval | |
|---|---|---|---|---|
| | | | Lower Bound | Upper Bound |
| ,986 | ,012 | ,000 | ,962 | 1,000 |

The test result variable(s): PROTEIN LEVELS SANDWICH ELISA has at least one tie between the positive actual state group and the negative actual state group. Statistics may be biased.

a. Under the nonparametric assumption

b. Null hypothesis: true area = 0.5

The AUC (Area under the Curve) value is 98.6% (IK95%; 96.2% - 100%), meaning that if the ELISA Sandwich protein content / content score is used to diagnose the presence or absence of psychotic symptoms due to methamphetamine abuse in 100 clients, then the right conclusion will be obtained at 98.6 clients.

**Table 4. Coordinates of the Curve**

**Test Result Variable(s): PROTEIN LEVELS SANDWICH ELISA**

| No. | Positive if Greater Than or Equal Toa | Sensitivity | 1 - Specificity |
|---|---|---|---|
| 25 | 1,9600 | 1,000 | ,100 |
| 26 | 2,1650 | 1,000 | ,067 |

The test result variable(s): PROTEIN LEVELS SANDWICH ELISA has at least one tie between the positive actual state group and the negative actual state group.

The smallest cut-off value is the minimum observed test value minus 1, and the largest cutoff value is the maximum observed test value plus 1. All the other cut-off values are the averages of two consecutive ordered observed test values.

## Discussion

As is known that methamphetamine is one type of narcotics that are stimulant, if consumed will affect all parts of the brain, especially in the limbic system, namely the Nucleus Acumbens and Ventral Tegmental Area to activate dopamine (DA), then dopamine is released[16]. from storage. divesicular sites to the cytoplasm so that the amount of DA increases in the brain. Furthermore, DA can carry out automatic oxidation to produce DA-Quinones. DA-Kuinon is a very reactive molecule and easily produces semi-quinones that are not stable by the reduction process. Semi-quinones enter the redox cycle together with oxygen molecules to form reactive oxygen species (ROS).

Then, ROS and semi-quinone cause oxidative stress. Therefore, it can be said that this oxidative

stress plays an important role in the mechanism of MAP, where this is evidenced by the involvement of DA-Kuinon in the mechanism of MAP which induces neurotoxicity and psychotic symptoms in humans[14, 15]. DA-quinone is usually detoxified by genes catalyzed by the Quinoneoxidoreductase (NQOs) protein group and also this gene protects brain cell damage from oxidative stress. In humans, genetic evidence indicates that Quinoneoxidoreductase (NQOs) has four gene loci, both of which have been identified as NAD (P) H-quinone oxidoreductase 1 (NQO1) (Ross et al.) and NRH quinoneoxiductase 2 (NQOs) NQO2)[9, 11].

In a research article such as that conducted in Japan by Ohgake, S., et.al with the title "NQO2 gene polymorphism associated with methamphetamine psychosis", in his research found a percentage (11.7%) D / D of NQO2 genes in patients with prolonged psychosis had double the control (4.8%). On the other hand, this study shows that the NQO1 polymorphism (Pro187Ser), in which this gene is not associated with MAP abuse. The NQO1 gene is proven to be a risk factor for breast, lung and leukemia[3, 14, 18]. It has been explained that methamphetamine is a type of narcotic that is stimulant, because it affects the release of excessive dopamine neurotransmitters from Nucleus Accumbens (NA) and Ventral Tegmental Area (VTA) in the Limbic System that causes psychotic disorders. Meanwhile, the NQO2 gene serves to detoxify the effects of excessive dopamine, as well as protect brain organs from the effects of excessive dopamine poisoning which can cause permanent brain damage[14].

This NQO2 gene is "Helper", so it is normatively assumed that the lack of regulation of the NQO2 gene causes expression of the protein content of the low NQO2 gene, this can cause psychotic disorders in methamphetamine users[14,15], due to insufficiency. detoxification function and protection of the NQO2 gene. Further studies such as those conducted by Ohgake et al. (regarding the NQO2 gene polymorphism), we then tried to conduct another study, namely how the influence or contribution of protein levels from the NQO2 gene to psychotic disorders in methamphetamine users[6, 11]. Analysis of NQO2 gene protein content through Sandwich Elisa examination for occupants / perpetrators of methamphetamine abuse in the control group (Mental Disorders and Causative Behavior of Amphetamine Type Non Psychotic Stimulant Type) and case groups (Mental Disorders and Behavior of Addictive Substances of Amphetamine Type of Stimulant with Addictive Substance with Psychotic Type) ) gives different results, where the average value of the protein content in the control group is higher (3,657) than in the case (1,246). Whereas the recommended KURVE ROC (Receiver Operating Characteristic) cut-off is statistically recommended between 1,960 and 2,165, with a sensitivity value of 100% and specificity ≥ 90%, it means that a cut-off value osf 1,960 to 2,165 which can be used as a reference for the presence or absence potential psychotic disorders in methamphetamine abuse

## Conclusion

a. The mean value of the NQO2 gene protein level in the Sandwich Elisa examination for the case group ie MAP users = 1,246, lower than the value of the control group ie non Psychotic MA users = 3,657. b. The t-test results show the value of sig. (2-tailed) = 0,000 (smaller than alpha = 0.05 (<0.05)), so it can be assumed that there are differences between the samples in the case and control groups. c. Cut-Off CURVE ROC (Receiver Operating Characteristic) recommended statistically in both groups is between 1.960 and 2.165, meaning that if the expression value of protein content> 2.165 then the potential for psychotic suffering is great, on the other hand if <1.960, the potential is small for suffering from psychotics[2, 21].

**Source of Funding :** This study was not sponsored by government or pharmaceutical company fund.

**Ethical Clearance :** Taken from University Ethical committee

**Conflict of Interest:** Nil

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# Application Pis (Indonesia Wellness Progrsam) PK Model with Decision and Matriarchal Patriarchal Family of Compliance on the Family of the Suffering of Disease TB Lung Health in the Work Remu City Sorong

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## Abstract

**Background :** Indonesia Healthy Family Approach (PIS PK) is done by visiting the family, with the target and the target is a PK PIS family. Indonesia has a health problem that is in the public spotlight in 2018, namely the high number of cases of pulmonary *tuberculosis* (TB). Based on 2016 WHO *Global Tuberculosis Report*, Indonesia ranks second with the highest TB burden in the world. This includes many cases that have not been detected and have not been treated and have not been reported. In the family structure and cultural dimensions based on decision making known as Patriakal and Matriakal. By knowing the pattern of household decision making, it can also be seen whether there is dominance in a household.

**The Research Objective :** Knowing overview and analyze the application of PIS PK (Healthy Indonesia Program) model of decision making patriarchal and matriarchal families on treatment compliance in family members who suffer from pulmonary tuberculosis in Puskesmas Remu Sorong.

**Research design** : Quantitative and qualitative research. Quantitative research method is *case control* design The qualitative research method is phenemoenology . The population in this study is the manager of the PK PIS program and all family members who suffer from TB in the work area of the Remu Puskesmas in Sorong City. The sample in this study amounted to 32 respondents.

**Results :** They have been done and they have the document but not maximum home visits, and patients taking the medicine lazy. Test using the *Old Ratio* (OR) with an *estimate* of 8.333 means that the application of PIS PK in accordance with the guidelines on matriarchal decision making is 8 times the risk of being folded from patriarchal decision making. The implementation of PIS PK in accordance with the guidelines for medication compliance 10 times the risk of compliance with treatment compliance .

**Conclusion :** Application of PIS PK has documents, but not optimal, PIS Application of PK with decision model testing friendly *old ratio of* 8 times the risk in decision-making, and PK of the compliance application PIS treatment 10-fold risk of adherent treatment. Suggestions for community health centers as a result of data collection to the community to discuss further interventions and empower the community.

***Keywords :*** *Application of PIS (Program Healthy Indonesia) PK, Model Making*

## Introduction

The Healthy Indonesia Program with a Family Approach (PIS PK) is carried out by visiting families, and the target of PIS PK being families. Family approach support the achievement of healthy Indonesia program[1].

In PIS-PK has been set twelve major indicator as a marker of health status of a family that includes the family followed the family planning program, deliver at a health facility, the baby gets fully immunized, infants received breast milk (ASI) exclusive, toddler get growth monitoring, tuberculosis patient pulmonary receive treatment according to standard, people with

hypertension take medication regularly, people with mental disorders receive treatment and neglect, family members no one smokes, the family has become a member of the National Health Insurance (JKN), the family has access to clean water facilities, families have access to or use a toilet. The Government may establish addition indicator to principal indicator in accordance with the conditions and needs of the region so that West Papua add one indicator is the examination and treatment of malaria, according to the standard so that, in West Papua has become a healthy thirteen indicators[1] .

Based on 2016 *WHO Global Tuberculosis Report*, Indonesia ranks second with the highest TB burden in the world[2].

Globally in 2016 there were 10.4 million TB incident cases (8.8 million - 12, million) which is equivalent to 120 cases per 100,000 population. WHO data in 2017 Indonesia ranks third highest sufferers. The number of new TB cases in Indonesia was 420,994 cases in 2017[3].

Data and information from the province of West Papua show that the number of cases of all types was 1921 cases, the highest in 658 cases in Manokwari, while in Kota Sorong it was 332 cases and. Of these, there were 1061 new positive BTA tuberculosis cases .

The results of the focus group discussions (puskesmas staff) most of the informants stated that the personnel involved in the data collection of PIS-PK at the puskesmas who had been running PIS-PK had not yet received a decree as PIS-PK implementer. The data collection officer is only given a special assignment letter. Most informants objected to the policy requiring HR in all puskesmas involved in the collection of PIS-PK to have attended training.

In the family structure and cultural dimensions based on decision making known as Patriakal and Matriakal. Patriarchal is a condition where decision making by the husband or the husband's extended family. While matriacal is a household condition where decision making is on the part of his wife or extended family .

The family approach is one way to increase the reach of targets and bring closer/improve access to health services in the work area by visiting .

Puskesmas Remu Sorong city is one health center under the Government of Sorong that organizer outdoor activities building one by direct observation of spaciousness which is the implementation of the Indonesia Program Healthy Approach Family (PIS-PK). The total residents of four villages that 31,532 inhabitants. Of these, until March 2018 there were 15 TB positive people . Meanwhile those with suspected tuberculosis recorded 57 people . In 2019 there were 48 patients suffering from positive pulmonary TB. as for the application of PIS PK through new manager 2018 year program is applied in South Remu village, and in 2019 will be carried out in Sub Malabutor[7].

## Materials and Method

This type of research is a *mixed* research that is quantitative and qualitative. Quantitative research methods that use *case control* design. Qualitative research methods with using a phenomenological approach .

**Finansial Source**: The source of funding in this study is DIPA Poltekkes Sorong 2019.

## Research Results

**Table 1. Characteristics of Respondents**

Table 1. shows the many aged 31-40 years (31.2%), most of the male sex (62.5%), Education least a lot of high school (37.6%) and most work as self-employed (40.6 %).

**Univariate Analysis**

**Table 2. Frequency Distribution According To The Application Of Respondent PK PIS**

| No | Lung TB | Amount | % |
|---|---|---|---|
| 1 | In accordance with the Guidelines | 27 | 84,4 |
| 2 | Not in Accordance with the Guidelines | 5 | 15,6 |
| 3 | Total | 32 | 100.0 |

Application of PIS PK the most appropriate guidelines which 27 (84.4%) compared to not match the guidelines which 5 (15.6%) of respondents.

**Table 3. Frequency Distribution According To Patriarchal And Matriarchal Family Decision Making**

| No | Decision-making | Amount | % |
|---|---|---|---|
| 1 | Matriarchal | 20 | 62,5 |
| 2 | Patriarchal | 12 | 37,5 |
| 3 | Total | 32 | 100.0 |

The decision of the mother's family (matriarchal) of respondents is more that 20 people (62.5%) compared to the family decision of the father (patriarchal) which is 12 people.

**Table 4. Frequency Distribution According To The Treatment Compliance Of Pulmonary TB Respondents**

| No | Treatment Compliance | Amount | % |
|---|---|---|---|
| 1 | Obedient | 27 | 84.4 |
| 2 | Not obey | 5 | 15.6 |
| 3 | Total | 32 | 100.0 |

The highest number of obedient pulmonary tuberculosis respondents were 27 (84.3%) compared to 5 (15.6%) disobedient.

**Bivariate Analysis**

**Table 5. Cross Table of The Implementation Of PK PIS With Patriarchal And Matriarchal Decision Making Models For Family Members Affected By Lung TB In The Work Area Of The Remu Health Center In 2019**

| NO | Application of PIS PK | Decision Making Model | | | | Total | |
|---|---|---|---|---|---|---|---|
| | | Patriarchal | | Matriarchal | | | |
| | | f | % | f | % | f | % |
| 1 | Corresponding | 9 | 33,3 | 18 | 66,7 | 27 | 100 |
| 2 | It is not accordance | 3 | 60,0 | 2 | 40,0 | 5 | 100 |
| | Total | 12 | 37,5 | 20 | 62,5 | 32 | 100 |

Test Statistics *Old ratio* shows that the value of "Estimate" which means 8.333 application of PIS PK according to the guidelines in the decision-making matriarchal 8 times as much risk of the patriarchal decision making.

Asymp Value *Sig (2-Sided)* shows p value of 0,000<0.05, so it can be concluded that there is a significance of the application of PIS PK with patriarchal and matriarchal decision making models in family members suffering from pulmonary TB in the working area of Remu Puskesmas in Sorong City.

**Table 6. Cross Table The Application Of PIS PK To The Compliance Of Medical Treatment Of Family Members Suffering From Pulmonary TB In The Work Area Of The Remu Health Center In 2019**

| No | Application Of PIS PK | Treatment Compliance | | | | Total | |
|---|---|---|---|---|---|---|---|
| | | Obedient | | Not Obey | | | |
| | | F | % | F | % | F | % |
| 1 | Corresponding | 21 | 77.8 | 6 | 22.2 | 27 | 100 |
| 2 | It Is Not Accordance | 3 | 60.0 | 2 | 40.0 | 5 | 100 |
| | Total | 27 | 84.4 | 5 | 15.6 | 32 | 100 |

Test statistics *old ratio* shows that the value of "Estimate" which means 10.333 application of PIS PK according to the guidelines on treatment compliance risk is 10 times higher than in non-adherent treatment .

Asymp Value *Sig (2-Sided)* shows the p value 0.000 <0.05, it can be concluded that there is a significance to the application of PIS PK obedience treatment to family members who suffer from pulmonary TB in the region of Puskesmas Remu Sorong.

**Determination of Sub Themes**

Based on the coding process, determining sub themes, 5 themes are found:

**6.** They Have A Cross-Program Meeting Discussed The Results Of Family Visits At The Puskesmas Level And What Are The Documents

The informant said that the meeting had been held. The informant said that the document exists and available.

**7.** Constraints Found

The informant said that the obstacle found was that the house visit was not optimal.

**8.** Documents On The Results Of Family Visit Presentations At The Puskesmas Level And The Variables Included

The informant said that documents were available on the results of the family visit and the variables included were TB patients who had *dropped out.*

**9.** Disseminate The Presentation Of The Analysis Of The Family Visit And Form The Dissemination Is Carried Out

The informant said that repeated home visits had been carried out, but those dropouts still did not seek treatment again for various reasons. Infoman also said that there were some patients who did not want to take medicine.

**10.** Dissemination Constraints Found

Infoman said that there were some patients who

did not want to take medicine .Informant said that he would announce the names of patients who did not seek treatment or coordinate further with cross-sectors.

## Discussion

Implementation Of PIS PK (Healthy Indonesia Program) With Patriarchal And Matriarchal Decision Making Models Of Adherence To Family Members Suffering From Pulmonary TB In The Working Area Of Puskesmas Remu

Healthy Indonesia program became the main program of Health Development which then planned accomplishments through the Strategic Plan (Strategic Plan) Ministry of Health of the Year 2015-2019, established by Decree of the Minister of Health No. HK.02.02/Menkes/52/2015, Minister of Health, 2016[2] .

Family approach is one way to increase outreach to target health centers and perform/improve access to health care in their working area to visit family, Minister of Health[2] .

In the implementation of PIS PK, it has been carried out according to the guidelines with home visits, in fact many people responded well to the presence of PIS PK in the working area of the Sorong City Puskesmas Remu, but many people also refused to be treated. Repeated home visits have been carried out but the *dropouts* still do not seek treatment anymore by sharing reasons.

**Implementation Of PIS PK (Healthy Indonesia Program) With The Model Of Patriarchal And Matriarchal Decision Making In Family Members Who Suffer From Pulmonary TB In The Working Area Of The Puskesmas Remu Sorong City**

The results showed application of PIS PK according to the guidelines in the decision-making matriarchal 8 times as much risk of the decision-making patriaka l. In get value p value 0.000 <0.05, it can be concluded that there is a significance the application of PIS PK with decision-making model of patriarchal and matriarchal family members who suffer from pulmonary TB in the region of Puskesmas Remu Sorong, almost similar to the research study that viewpoint in family decisions are mainly taken from family members with direct parenting duties.

The model of family decision making in dealing with family members suffering from pulmonary TB in the working area of the Puskesmas Remu is 62.5% dominant in mothers (matriarchal). According to the researchers' assumptions, it is in accordance with the culture of the local community where the decision maker decides to listen more to a wife or mother. This is because there are decisive aspects in making decisions such as: the type of household work, office work, family needs, basic needs and additional equipment and facilities available in the family, the time and energy available, which dominates is the mother. Mothers have the feeling high worried when a family member is sick, so the phenomenon in found that the mother is to play a role in encouraging and motivating family members who suffer from pulmonary tuberculosis, even the existing situation the mother also act as watchdogs to take medication pulmonary tuberculosis.

**Application of PIS PK (Healthy Indonesia Program) To The Compliance Of Medical Treatment Of Family Members Suffering From Pulmonary TB**

The results showed estimate the value of 10.333 means application of PIS PK according to the guidelines on treatment compliance risk is 10 times more than the non-adherent treatment and get the value *asymp* show 0,000 p value <0.05, it can be concluded that there is no significance to the application of PIS PK treatment Compliance in family members suffering from pulmonary TB in the working area of the Sorong City Puskesmas Remu.

As many as 32 respondents, most of them (84.4%) were obedient in undergoing treatment for pulmonary TB that lasted 6 months. According to the researchers' assumptions, because respondents were still in the category 1 treatment (87.5%), apart from that many family members who adhered to TB treatment because of family support in this case the mother (wife), the mother was able to make decisions, the family in terms of this mother is able to care for family members who experience health problems, mothers are able to encourage families to seek treatment at existing health facilities in order to deal with health problems in this case the treatment of pulmonary TB. Besides family members who visited regularly influenced by the level of education in which the vast majority were high school

(37.6%).

According to the researchers' assumptions that the obstacles found were not optimal, the visits were made, due to lack of time and human resources. The existence of TB patients who *drop out* because the patient feels bored with the consumption of taking large amounts of medicine and for a long period of time, so that patients think to stop taking the drug and switch to other treatments, such as herbal medicine[10,11]. Besides that, it can also be influenced by socio-economy in this case the work of family members who are mostly self-employed (40.6%) where this work takes time to fulfill their living needs.

## Conclusions

Based on the results of the research, it can be concluded :

4. Application of PIS PK (Program Healthy Indonesia) pulmonary TB disease in the region of Puskesmas Remu has been done and have the document. But in practice, there are obstacles that are not yet a maximum of home visits, and patients are lazy to take medication.

5. It was concluded that there was a significance of the implementation of PIS PK with Patriarchal and Matriarchal Decision Making Models in family members suffering from pulmonary TB in the working area of Remu Puskesmas in Sorong City

6. There is a significance of the implementation of PIS PK with Compliance with treatment to family members who suffer from pulmonary TB in the working area of the Puskesmas Remu in Sorong City.

**Ethical Clearance**- Taken from university ethical committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

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# Decompression Sickness Indicators in Traditional Divers in Bajo, Boalemo District

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## Abstract

Decompression is a health problem due to changes in ambient pressure in the body due to the accumulation of nitrogen which forms bubbles in the body when the dive takes place. The bubbles are not released which leads to the clogging in the blood flow and the nervous system of the diver. This study aims to determine the indicators of decompressionoccurence in traditional divers in BajoVillage, Boalemo District. This was a cross sectional study with a population of 69 people (exhaustive sampling). Data collection is conducted through interviews and physical examinations on divers. The instruments used were questionnaires, history sheets, height and weight measurements. Multivariate data analysiswas carried out using smart PLS applications. The results of this study indicate that of 69 respondents, 41 people (59.4%) of them experienced symptoms of decompression sickness, both at mild and severe level. From the results of multivariate data analysis, it is obtained the results of variables that have a significant relationship (> 1.96) with the incidence of decompression problems, namely the duration of diving (2.453), rising to the surface attitude (3.703) and depth (3.516). It is concluded that the length of diving, the way the diver rise to the surface and depth of divingwere some of indicators of the incidence of decompression in traditional divers in Bajo Village, Boalemo District. It is suggested that divers carry out dives in accordance with safe procedures.

***Keywords:*** *Decompressionsickness,traditional divers, duration of diving, rise to the surface*

## Introduction

Indonesia is the largest maritime country in the world. Its sea area covers 5.8 million km2 or around 2/3 of the entire territory of the Republic of Indonesia. The area of Indonesia's Exclusive Economic Zone (EEZ) reaches 2.7 million km2 with a total of 17,504 islands. Apart from that, marine resources in the form of fisheries are also very abundant. There are about 8,500 species of fish, 555 species of seaweed, 950 species of coral reef biota[1].

One type of occupation that we often encounter in coastal or island communities is traditional divers. It is estimated that there are around 7 million divers worldwide(Lee an ye, 2013). In Indonesia, these traditional divers generally still apply the traditional methods. This traditional traditional diver is often called the Compressor Fisherman, a diver who uses very limited equipment [2.3].

The submersion of divers into the water will affect the condition of divers. Evenmore, it may have a high risk to their health, such as pain, paralysis, disability, and death. The risks in question are not only due to the dive itself, but are also influenced by the underwater environment, the diving technique used and the mental and physical condition of the divers [4].

One of the many diseases that occur in divers is decompression sickness or also known as Caisson Disease. This disease is a disease caused by the formation and increase in bubble size when the partial pressure of inert gases in the blood and tissues that exceeds ambient pressure [5].

The formation of air bubbles will block blood flow and the nervous system and eventually cause symptoms such as pain in the joints, headaches, itching,

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numbness, paralysis and even death. The incidence rate of decompression disease based on the Divers Alert Network (DAN) report on commercial dives was reported as many as 35.3 cases per 10,000 dives [6]. In addition, in the United States, the incidence of Caisson Disease for type II (severe) was 2.28 cases per 10,000 divers.In Timilnadu, India, there were 21 deaths due to diving within a period of 2 years, namely in 2012 and 2013 [7].

In Indonesia, decompression is a sickness that is often experienced by traditional divers. The Ministry of Health's research on accidents and diseases that occur in traditional fishermen and divers shows that 57.5% of fishermen on Bungin Island, West Nusa Tenggara experience joint pain and 11.3% experience hearing loss. Whereas in the KepulauanSeribu, DKI Jakarta, 41.4% of fishermen experienced barotrauma and 6.9% experienced decompression sickness[8].

In Makassar, particularyon the island of BarrangLompo, the results of research conducted on 47 people with decompression sickness. Risk factors that influence statistically with the incidence of decompression in traditional divers are the period of work and how to rise to the surface, while rest periods do not affect statistically with the incidence of decompression in traditional divers. Multivariate analysis shows that tenure is the variable most at risk of decompression in traditional divers on BarrangLompo Island[9].

From the data above shows that in Indonesia there are many cases of occupational diseases experienced by traditional divers. Furthermore, there may be more cases that are similar but have not been reported or have not been found. In BoalemoDistrict, Gorontalo province, there is a village where most of the residents' livelihoods are fishermen, including traditional divers who use compressors, namely Bajo Village. Most of the residents are of Bajo tribe. We often encounter people with disabilities and are paralyzed as a result of diving work. Some of them do not go to health service facilities resulting in unrecorded number of cases. Consequently, this problem has not become a targetto be intervened by the parties concerned. Based on the above, a study the indicators of the incidence of decompression sickness in traditional divers is needed in Bajo Village, Boalemo District.

## Materials and Methods

### *Research location and design*

This research was conducted in Bajo Village, BoalemoDistrict, Gorontalo Province. The type of research is an observational analytic using a cross sectional study design.

### Population and sample

The population in this study was all traditional divers who at that time were domiciled in Bajo Village, Boalemo District and the entire population was used as the object of this study (exhaustive sampling) of 69 people.

### Data Collection Method

Data was collected by researchers and physicians through questionnaires, history sheets, height and weight measurements. Data on symptoms of decompression were measured by history and physical examination by the examining physician, age, length of work (tenure), length of diving, depth and how the diver rises to the surface are measured by interview using a list of questions and body mass index data measured by body scales and height measurement tools.

### Data Analysis

Data from interviews and measurements were analyzed using several computer softwares. Univariate analysis was conducted using SPSS for Windows 25 to determine the frequency distribution while multivariate analysis uses the Smart PLS software to determine the relationship between variables.

## Results

### Frequency distribution

Table 1 shows that based on the age of divers, there are 29 people in the category of risk of decompression and 40 people who are not at risk of decompression.

**Table 1. Frequency distribution of risk factors for decompression in traditional divers in Bajo Village, Boalemo District**

| Variables | DCS-Risk | | DCS- Non Risk | |
|---|---|---|---|---|
| | Criteria | n | Criteria | n |
| Age | <16 / >35 y.o | 29 | 16-35 y.o | 40 |
| Body Mass Index (BMI) | > 25 | 51 | ≤ 25 | 18 |
| Tenure | ≥ 5 year | 57 | < 5 year | 12 |
| Length of Dive | > 1 hour | 64 | ≤ 1 hour | 5 |
| Depth | ≥ 15 m | 56 | < 15 m | 13 |
| Rise to the Surface | Fast | 57 | Slowly | 12 |

Based on body mass index, there are 51 people in the category of risk of decompression and 18 people who are not at risk of decompression. Based on the working period of the divers there are 57 people in the category of risk of decompression and 12 people who are not at risk of decompression.

**Table 2. The Relationship Between Variables in Traditional Divers in Bajo Village, Kab. Boalemo**

| | Original Sample | p-value |
|---|---|---|
| AgeàDecompression Sickness (DCS) | 0.128 | 0.227 |
| BMIàDecompression Sickness (DCS) | 0.134 | 0.103 |
| TenureàDecompression Sickness (DCS) | 0.151 | 0.239 |
| Length of Dive à Decompression Sickness (DCS) | 0.243 | 0.015 |
| Rise to the Surface àDecompression Sickness (DCS) | -0.309 | 0.000 |
| Depth àDecompression Sickness (DCS) | 0.350 | 0.000 |

Based on the duration of the dive, there are 64 people in the category of risk of decompression and 5 people who are not at risk of decompression. Based on depth, there are 56 people in the category of risk of decompression and 13 people who are not at risk of decompression. Based on how the diver rises to the surface, there are 57 people in the category of risk of decompression and 12 people who are not at risk of decompression.

**Relationship Between Variables**

Figure 1 shows the relationship between variable length of diving, how to rise to the surface and depth with decompression disease which have significant relationships (> 1.96).

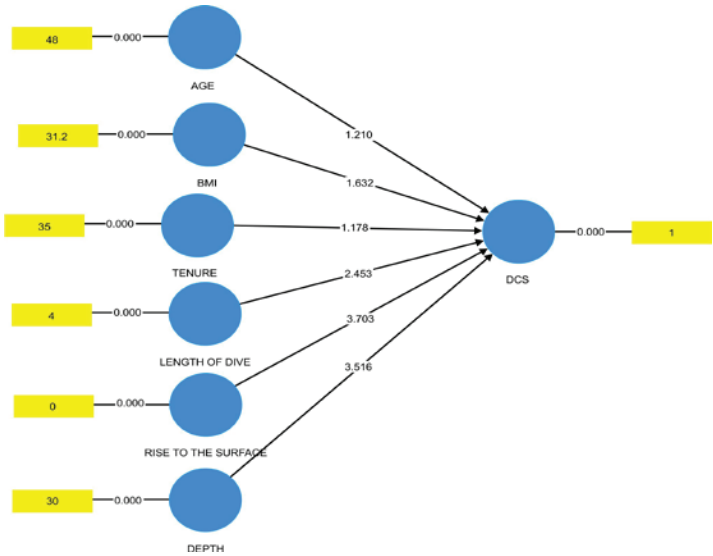


**Figure 1.Relationship between variables in traditional divers**

In detail, the duration of diving (2.453), how to rise to the surface (3.703), and depthof dive(3.516)with the p-value of each dive time (0.015), how to rise to the surface (0.000), and depth of dive (0.000).

## Discussion

***Relationship between length of diving and decompression sickness***

The results of this study indicate that the duration of diving has a significant relationship with the incidence of decompression in traditional divers in Bajo Village, Boalemo District (p-value = 0.015). Every individual has different abilities in terms of the length of diving in the water. The duration of the dive will affect the absorption and release of gases in the body's tissues and blood, especially nitrogen gas. Changing the composition of the gas will cause decompression and barotrauma.

This research is in line with that conducted by [9](Wijaya, 2018) stating that diving duration is a risk factor for the occurrence of decompression. The study is also in line with the results of research conducted by [10](Jusmawati, 2016) and [8](Duke, 2017). However, the results are in the contrary to the study conducted by [11](Sukmajaya2010) where the results of the study showed no significant relationship between the duration of the dive with decompression sickness. This is likely due to the relatively small number of samples in the study so that it cannot state an association with the effect factor.

The diving, the divers in Bajo Village must pay attention to the duration of this dive, the dives should be carried out in a well-planned manner, taking into account the time of the dive and it is best to avoid diving with of high-risk duration. In the current practice, divers do not dive according to the initial plan, but based on the number of catches obtained in the sea. If the catch is deemed insufficient, then the divers will remain in the water as long as their bodies are deemed able to sustain.

Diving using a compressor as an air source is very potentially lead to decompression sickness due to a long dive. The air supplied by compressor is not limited with time where as long as the air tank in the compressor tube is still available, or the compressor engine is still on, the air supply will still be available.

***Relationship betweendepth with decompression sickness***

The results of this study indicate that depth of diving has a significant relationship with the incidence of decompression in traditional divers in Bajo Village, Boalemo District (p-value = 0.000). This study is in line with research conducted by [9](Wijaya, 2018), [8](Duke, 2017) dan[12](Alaydrus, 2014)which found that depth is a risk factor that significantly influences the incidence of decompression in diver.

When a diver submerges into the water, there are two pressures that burden his body, namely the pressure of the air above the water and the pressure from water

itself. The amount of atmospheric pressure varies depending on the altitude of the surface of the sea or lake, while the water pressure is the pressure caused by the weight of the water that is above the body of the diver [13].Every 10meter depth increase, there is an increase in 1 ATA pressure (absolute atmosphere). The deeper a person dives, the greater the pressure received and the risk of decompression will also be even greater.

The deeper a person dives, the higher the pressure towards by the body so that more nitrogen will be dissolved and absorbed by the blood and organs of the body. If the body cannot adjust to this pressure, squeese or trauma can occur. This trauma usually occurs at depths of more than 10 meters. In addition, the deeper the dive, the lower the temperature in the water. Therefore, divers can lose body heat followed by other disorders such as tingling, cramps, etc. [14].

Relationship between how to rise to the surface with decompression

The results of this study also indicate that the behavior by which the diver rises to the surface after diving has a significant relationship with the decompression sickness in traditional divers in Bajo Village, Boalemo District (p-value = 0.000). This study is in line with previous studies conducted by [15](Rahmadayanti, 2017), [16](Linggayani, 2017), [9] (Wijaya, 2018) dan[17](Wahab, 2008)which found that there was a significant relationship between the way the diver rises to the surface and the incidence of decompression.

When a diver rises to the surface after a rapid dive, it will cause air pressure outside the body to be lower than air pressure in the body so that nitrogen dissolved in the blood will come out of the body and form larger nitrogen bubbles and can compress or clog some blood vessels and nerveus system of the body. Lack of knowledge of divers causes them not to carry out proper and correct diving procedures[15-19].Another aspect that usually causes a diver to rise to the surface quickly is if the diver encounters a wild or poisonous sea animal or if the compressor hose is twisted and clogged or the compressor is experiencingdamage.

Based on the results of interviews with traditional divers in Bajo Village, several divers conducted something that was believed to reduce the risk of decompression; once arrive to the surface, the diver did not directly get on the boat, but first dwelled on the surface of the water while holding on the edge of the boat waiting time to feel like urinating, and after urinating then the diver climbed onto the boat.

## Conclusions and Recommendations

Decompression sickness indicators in traditional divers in Bajo Village, Boalemo district are the duration of diving with t statistics (3.703), the way the divers rise to the surface with t statistics (3,516) and the length of work with t statistics (2,453)

.Thus, it is recommended for divers to carry out diving activities in accordance with safe diving procedures and it is recommended that the marine service conduct counseling or training on how to dive safely on these traditional divers. Further research should specify more on the different types of decompression sickness namely type 1 and type 2. It is recommended to research about the effects of using a compressor on divers

**Ethical Clearance**- Taken from University ethical committee

**Source of Funding**- Self

**Conflict of Interest** - Nil

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# The Coparation between Exclusive Breastfeeding and Infant's Development at the Age of 6 Months in Rskia Pertiwi Makassar South Sulawesi Indonesia

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## Abstract

**Background:** The growth and development of children is influenced by nutritional factors, one of which is exclusive breastfeeding. It is known that until the age of 6 months of breastfeeding. (ASI) is an ideal food for babies both in terms of physical and psychological health.

**Research Purpose:** This research compare development of babies aged 6 months who were breastfed exclusion and not exclusively breastfed.

**Research method**: This study uses a case control design and conducted in 2017. The research subjects infants aged 6 months were exclusively breastfed and not breastfed exclusively in RSKIA Pertiwi Makassar. Development of infants assessed with the scale **KPSP (Pre-Screening Questionnaire Development).** exclusive breastfeeding effect on the development analyzed by t.

**Conclusion:** The results showed the development of exclusively breastfed infants given a significant (p <0.05), clinically obtained the value of OR 36, 75 means that infants fed exclusively breastfed increased 36, 75 times more suitable compared groups of infants who are not breastfed exclusively.

***Keywords****: Exclusive breastfeeding, Development, KPS*P.

## Introduction

The growth and development of children is influenced by nutritional factors, one of which is exclusive breastfeeding. It is known that until the age of 6 months of breastfeeding. (ASI) is an ideal food for babies both in terms of physical and psychological health.[1] premisesn exclusive breastfeeding until the baby is 6 months old will ensure the achievement of the development of children's intelligence potential optimally. Mother's milk other than as a nutrient that is ideal, with the right composition, as well as tailored to the needs of the baby, breast milk also contains nutrients specialty such as taurine, lactose, AA, DHA, omega 3, omega 6, choline, and tryptophan needed baby's brain to grow sinapto- optimal to assist in the genesis and the process of myelination. The more synapses between nerve cells more complex the ability to receive, process, store and respond stimuli received by the nerve cells. In general the number of synapses increases rapidly between the ages of 3-4 months, then going relationship with visual information processing center until the age of 6 months[2-4].

The Kemenkes[5] recommends exclusive breastfeeding for the first 6 months of life and continued until the age of 2 years. Breast milk is the best food for babies because it contains all the nutrients a baby needs in appropriate amounts and immunologic substances that protect the baby from infection. Based on the accumulated

evidence of the protective effect of breast milk protects against infectious diseases including for example, digestion and breathing. Moreover, the lingering effects where breastfeeding potential to prevent at some of the results that have been studied for preventing obesity in children, improve cognitive function, prevent dental caries, gastric disorders and respiratory disorders. This is due to the presence of antibodies contained in breast milk colostrum. Feeding can regulate energy intake associated with the internal response in recognizing the feeling of satiety[5-7].

The development is increasing the body's structure and function is more complex in coarse motion capability, smooth motion, speech and language as well as socialization and independence. The development is the result of the maturity of the central nervous system interaction with the affected organ, such as the development of the neuromuscular system, speech, emotion and socialization. Impaired development could result in the emergence of several possibilities, including speech delays caused Child Global Development Delay (general psychomotor developmental delay), abnormalities of the sensory nerves to the hearing, Down Syndrome, and autism[8].

Screening / examination using KKSP child development (pre-screening questionnaire development) to know normal child development or not. KKSP used as deemed relevant in analyzing the development of the appropriate stages of the child's age[9,10.]

With regard to the importance of the development of exclusive breast-fed infants, the authors wanted to do research on cognitive function comparison infants aged 6 months who have received and are not exclusively breastfed and selected research sites in Makassar due to declining rates of exclusive breastfeeding in infants in Makassar.

## Materials and Methods

### *Research Location*

Research was conducted The Pertiwi RSKDIA Makassar,

### *Research design*

This research is a kind of analytical research using case control design. Subjects were all infants aged 6 months in RSKDIA Pertiwi Makasar exclusively breastfed and who are not exclusively breastfed.

### *Population*

Population is the research object or object under study Notoadmodjo[11]. As for the population in this study is a 6-month-old baby, either given or not given exclusive breastfeeding in Makassar.

### *samples*

Samples are partly taken from the whole object under study were considered representative of the entire population[11]. The samples in this study were part of the population of babies aged 6 months, either given or not given exclusive breastfeeding in Makassar. To determine the sample, in this study researchers used a purposive sampling technique

## Results

### *The univariate analysis*

Research has been conducted on 60 mothers who had infants aged 6 months. Data characteristics of the respondents in this study include the mother's age, education, occupation, age of the last child, knowledge, exclusive breastfeeding.

1. characteristics of respondents

**Table 1 Characteristics of Respondents by age of mother**

| Age | frequency | Percent (%) |
|---|---|---|
| ≤ 35 years old | 29 | 48.33 |
| > 35 years | 31 | 51.67 |
| Total | 60 | 100 |

*Source: Primary Data Year 2017*

Table 1 shows that 60 respondents, obtained with age ≤ 35 years as many as 29 respondents (48.33%), While respondents with age> 35 years as many 31 respondents (51.67%)

**2. Breastfeeding**

**Table 2 Characteristics of Respondents in Breastfeeding**

| **breastfeeding** | **F** | **%** |
|---|---|---|
| Exclusive breastfeeding | 30 | 50 |
| not Exclusive | 30 | 59 |
| Total | 60 | 100 |

*Source: Primary Data Year 2017*

Table 2 shows that 60 respondents, found respondents give Exclusive breastfeeding 30 (50%), while those not exclusively breastfed were 30 (50%) of respondents.

3. Baby's development

**Table 3 Development of Infants**

| **infant development** | **F** | **%** |
|---|---|---|
| Corresponding | 36 | 60 |
| question | 23 | 38.33 |
| digress | 1 | 1.67 |
| Total | 60 | 100 |

Table 3 shows that out of 60 babies, infant development according the growth obtained a total of 36 (60%), development of infants doubt there are 23 (38.33%), while the development of the baby deviation of 1 (1.67%) infants.

4. Exclusive breastfeeding comparison with developments in Infants

**Table 4: Development of Infants**

| | **infant development** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Corresponding** | | **digress** | |
| | **Corresponding** | | **question** | | **digress** | **P** | **OR** | **P** | **RR** |
| | n | % | n | % | n % | CI 95% | | CI 95% | |
| care | | | | | | | | | |
| exclusive | 28 | | 2 | | 0 | <0.001 | 36.75 | - | - |
| not Exclusive | 8 | | 21 | | 1 | 6.29-357.42 | | - | |

*Source: Primary Data Year 2017*

Table 4 showed that exclusive breastfeeding comparison to the development of infant outcome was significant (P <0.05). Clinically obtained OR 36.75 value means that infants given breast milk for exclusive development corresponding 36.75 times more than those who are not breastfeeding exclusively.

## Discussion

Breastfeeding will make the baby feel sticky and safe. Sense have a baby in the first and second year of life. Breastfeeding infants will help the optimal development after the perinatal period. Accordingly, the results of this study stated that earned comparisons infant development given exclusive breastfeeding at P <0.05 by babies who are not breastfed exclusively. Clinically obtained OR 36.75 value means that infants given breast milk for exclusive development corresponding 36.75 times more than the group of infants who were not given breast milk exclusively. This suitability is because breast milk has nutrients that are best and most complete comparison with other prelakteal foods including infant formula. Type breastfeeding given to infants 6 months of age can also affect the results. This is in line with research conducted by Any S, *et al*[12] that shows that children who are breastfed exclusively the majority (76.2%) did not have the mental emotional problems, while children who do not consume exclusively breastfed tend to have mental emotional problems (64.3%). Based on the research results Ida, *et al*[13] on the status of breastfeeding in infants aged 0-6 months got that out of 76 respondents there were 42 respondents (55.3%) exclusive breastfeeding to their babies and there are 34 respondents (44.7%) did not exclusive breastfeeding to their babies. Babies who are exclusively breastfed will get all the advantages of breastfeeding and nutritional needs are met to the fullest and will experience optimal growth and development. Research Anes MP[14] also showed significant between exclusive breastfeeding with no developmental differences in infants aged 6 to 12 months in Beji Depok subdistrict health center. The results showed that exclusively breast-fed babies are at risk 9.5 times progressing appropriate than experiencing developmental disorders when compared to babies who are not breastfed exclusively.

This can occur because milk contains vital substances needed by babies including protein, carbohydrate, and fat accumulated alveolar of breast. Here excess milk composition when compared to other formula: first, the protein in breast milk is more easily digested than protein available in infant formula. Protein in milk contains about 6% of calories. Additionally, Lactose is the main carbohydrate. Carbohydrates in Human milk contains about 42% of calories. Then, cholesterol as the most essential substances in the highest brain development contained in breast milk. Milk fat contains about 52% of calories. Breast milk also contains vitamins and minerals that are transferred from maternal plasma and lastly, Breast milk contains antibodies from the maternal system which can reduce the danger of infection of newborns [15-17]. Thus, exclusive breastfeeding can boost development in infants because of all the nutrients that the baby needs to achieve the developmental stage, can be met by breast milk. Other research also has the same result is the research conducted by Lidya. N.M and Rodiah[13] in Karang Anyar health center which shows the significance of the development of exclusive breastfeeding in infants aged 3 to 6 months.

In addition, research conducted states that there is a positive relationship between the duration of exclusive breastfeeding within months with the motor component in children and in the overall index of development of children up to the age of 6 years[18]. Another study conducted by Bodnarchuk and Jenifer[19] in Canada also said that the long duration of breastfeeding can enhance cognitive abilities and motor development of infants; motor development (particularly the ability to crawl in infants) can trigger significant changes in the baby's cognitive ability. In another study conducted in Europe with a cohort design, the data found that children who were exclusively breastfed up to 3 full months, had an average rate of intelligence (IQ) 2, 1 point higher than the other children. While the children are breastfed up to 4-6 months had an average rate of intellect 2.6 points higher than that of other children. And the benefits for children who are breastfed longer (> 6 months) may increase the child's intellectual intelligence to 3.8 points higher than children who are not breastfed exclusively. Increased intelligence in infants, will have an impact on improving the development of gross motor, fine motor, language and social independence in infants 8 points higher than children who are not breastfed exclusively. Increased intelligence in infants, will have an impact on improving the development of gross motor, fine motor,

language and social independence in infants 8 points higher than children who are not breastfed exclusively. Increased intelligence in infants, will have an impact on improving the development of gross motor, fine motor, language and social independence in infants

Other studies obtained different results with this study is the result of research conducted in sragen known to most of the growth of children 1-6 months are breastfed exclusively or non-exclusive breastfeeding in the normal category. Most child development given 1-6 months exclusive breastfeeding and exclusive breastfeeding is not normal. No difference between the growth of children breast-fed exclusively with not exclusive ASI. No difference between the child's development in breastfed exclusively with the non-exclusive breast-fed.

## Conclusions and Suggestions

The results showed that there are 60% of infants who breastfed exclusively had been developed accordingly. While38.33% Were not given exclusive breastfeeding progressing dubious and there 1.67% deviate baby development because it is not exclusively breast-fed. The study states that there is a significant relationship between exclusive breastfeeding with the development in infants. Infants given breast milk for exclusive development corresponding 36.75 times more than those who are not breastfeeding exclusively

Further studies on the things that relate to the development of children who are limitations to this study as a stimulus factor, systemic disease factors, and comparison of the frequency of breastfeeding and giving PASI. In addition, other researchers also need to use the data scale and measuring devices are better than the ones used in this study. The study design with the case-control approach also will show better results.

**Ethical Clearance**- Taken from ethical university committee

**Source of Funding**- Self

**Conflict of Interest** - Nil

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# Effects of Classical Music Therapy on Anxiety Level of Caesarean Section Mother

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## Abstract

Caesarean delivery will cause mother to experience anxiety. It can cause interference to the physiological processes in the body. This research aims to find effectiveness of classical music therapy on anxiety level of casarean section mother at Syekh Yusuf Regional General Hospital, Gowa district, by using Hamilton Rating Scale (HARS). This research was an experimental research with a pre-experimental design of one group pre-test and post-test design. The sample was 30 caesarean mothers who met the criteria.

Based on the results of Wilcoxon rank statistical analysis test, p value = 0,000 and smaller than the α value determined at 0.05. Therefore, it can be concluded that classical music therapy is effective to reduce anxiety level of caesarean mothers.

***Key words:*** *Classical music, anxiety, casarean section*

## Introduction

Childbirth is a process of expelling the product of conception from the uterus through the vagina to the outside world. Maternal Mortality Rate (MMR) in Indonesia has not yet reached 102 per 100,000 live births. According to data from 2012 Indonesian Health Demographic Survey (IDHS), Maternal Mortality Rate (MMR) in Indonesia is around 359 per 100,000 live births, an increase compared to 2007 with 228 per 100,000 live births. Although global intervention urges that the development to Millennium Development Goals (MDGs) in 2015 is below the achievement target.1,2

World Health Organization (WHO) sets standard rate for caesarean section in a country is around 10-15% per 1,000 births in the world. According to WHO, the increasing rate in sectio caesarea childbirth among many countries all over Asia reaches 110,000 during 2007-2008. In Indonesia the incidence of caesarean increased in 2000 by 47.22%, in 2001 by 45. 19%, in 2002 by 47.13%, in by 46.87%, in 2004 by 53.2%, in 2005 by 51.59%, and in 2006 by 53.68% and in 2007 there was no significant data.6 National Survey in 2009 stated there is 921,000 caesarean section from 4,039,000 childbirths or around 22, 8% of all childbirths.[1,3]

Caesarean section is the delivery through an incision on uterine wall through the front wall of abdomen. It can also be defined as hysterotomia to give birth to a fetus from uterus. Caesarean section is a priority consideration because it can save the lives of both mother and baby. However, the caesarean section process is not a safer alternative because it requires special supervision of indications and post surgical care for cesarean section to prevent inappropriate supervision that will result in death.[4,5]

Anxiety is unreasonable fear and is not supported by the situation. When an individual feels anxious, he/she feels uncomfortable or afraid or may have a hunch even though he/she does not understand why the disruptive emotions occur. There is no object that can be identified as anxiety stimuli. Further definition stated that anxiety is an emotion and subjective experience of an individual that is communicated interpersonally, having its own strengths and difficult to be observed directly.[6-10]

The data was obtained from Regional General Hospital Sheikh Yusuf Gowa regarding normal and caesarean section childbirth from 2015 to 2017. Normal delivery in 2015 is 1,011 patients, in 2016 there is 1,143 patients, and in 2017 there is 558 patients. While

caesarean birth in 2015 is 308 patients, in 2016 there is 250 caesarean childbirths, and in 2017 there is 443 caesarean childbirths. The number of patients indicate that there are a large number of caesarean childbirth every year. Based on the preliminary study at Regional General Hospital of Sheikh Yusuf Gowa, those who chose normal delivery are 1-2 patients and they experience anxiety symptoms, while caesarean is around 2-3 patients and most of them experience anxiety.

Further, the researcher is interested to conduct a research on "Classical Music Therapy Effectiveness on Anxiety Level of Casarean Section Mother at Sheikh Yusuf Gowa Regional General Hospital".

## Material and Method

### Research Design

This research was quantitative. The method was Pre-Experimental uisng One Group Pre-Test - Post Test, as the measurement of anxiety before and after the administration of classical music therapy on caesarean mothers.

### Population and Sample

There were 83 mothers who gave birth by caesarean section at Regional General Hospital of Sheikh Yusuf Gowa in 2019. Meanwhile, the sample was 30 people who met the sample criteria at Regional General Hospital of Sheikh Yusuf Gowa.

### Sampling Technique

The technique was purposive sampling. The purposive sampling with inclusion criteria as follows:

1) Willing to be a respondent.

2) Inpartu mothers scheduled for caesarean

3) Primigravida mothers

Data Analysis

The data analysis to determine the effects of classical music therapy to reduce anxiety level on caesarean section mothers was Wilcoxon rank test with alpha = 0.05.

RESULT AND DISCUSSION

This research was conducted on caesarean section mothers in 2019 by using one group pre test and post test design pre experimental design involving 30 respondents, the results are as follows:

**Table 1: Efectiveness of Classical Music Therapy on Reducing Anxiety Level of Caesarean Section Mothers at Regional General Hospital of Syekh Yusuf Gowa 2019**

| Variable | F | P | α |
|---|---|---|---|
| Negative Ranks | 30 | 0.000 | 0.05 |
| Positive Ranks | 0 | | |
| Ties | 0 | | |
| Total | 30 | | |

Data source: Wilcoxon test

The table indicates that from the 30 respondents given the music therapy, all respondents experience a decrease in their anxiety levels. The results of non-parametric statistical tests analysis using Wilcoxon with a confidence level of 95% ($\alpha = 0.05$), obtain p-value of 0,000, therefore, it can be concluded that classical music therapy is effective to reduce anxiety levels of caesarean section mothers.

## Discussion

Anxiety is a subjective and emotional aspect of an individual since it involves subjective unpleasant feelings and arising due to stress, fear of failure, insecurity and conflict that is usually experienced by patients when they will experience childbirth process.(11) (6) ( (12)

The decreased anxiety level by music therapy occurs because listening to music can activate cells in limbic system that is associated with emotional behavior and autonomic nerves. The limbic system is activated and the individual becomes relax. Trappe also stated that Mozart's classical music with a tempo of 60 seconds/ minute can activate the left hemisphere and right hemisphere of the brain. Both hemispheres are required to prepare music rhythm. Therefore, it will make someone become relax and comfortable after listening to classical music. Music evoked[11,13]

When a person listening to classical music (audio), the sound will travel through ear, vibrate the eardrum, then shake the fluid within ear and vibrate the hair cells in cochlea to further through the cochlear nerve to brain and create imagination in the right brain and left brain which will have an impact in the form of comfort and mood changes. Mood changes (feelings) caused by classical music can reach the left cerebral cortex area.[14,15]

The data analysis using Wilcoxon test obtained p value of 0,000. It can be concluded that classical music therapy is effective to reduce anxiety level of caesarean section mothers at Regional General Hospital of Sheikh Yusuf Gowa. Based on the Research, from a total of 30 samples there are 25 respondents who experience severe anxiety levels before classical music therapy. After the classical music therapy these 25 respondents experience mild anxiety level. There are 3 respondents who experience mild anxiety level before classical music therapy and after given classical music therapy, those 3 respondents experience moderate anxiety level. There are 2 respondents who experience moderate anxiety level before given classical music therapy and after given classical music therapy, those 2 respondents do not experience anxiety at all.

The results of the research are relevant with the research conducted by Dian Novita regarding the effects of classical music therapy on postoperative pain in open reduction and internal fixation (orif) at Dr.H.Abdul Moelok Regional General Hospital in Lampung Province. It is a quasi experiment research and non-equivalent pretest-posttest with control group, sampling uses causative sampling. Further, the results of the study states there is a significant effect of music therapy to reduce level of pain in patients with postoperative ORIF (p-value = 0.000; $\alpha = 0.05$).[16,17]

The results of the research is also relevant with Farhaatun Hayati's research on the effects of classical music therapy on anxiety levels of menopausal women in Pisangan region, Eastern Ciputat, Southern Tangerang. This study used a pre-experiment method with one group pre-post test design. The result indicates there is an effect of classical music therapy to the anxiety level of menopausal women with a value ($p = 0.000$).[16-19]

The anxiety experienced by respondents are also differed from one another. It is because each respondent has a different psychological state so, they have different attitudes in coping with any changes. So, one of the therapy to be used is music. Music can increase creativity, build self-confidence, develop social skills, and improve motor skills, perception, and psychomotor development. It can also be used as a therapy for various needs, such as substituting depressant drugs for those who will face a surgery at the hospital. [17,20-24.]

This is relevant with Djohan who explains that music therapy aims to help expressing feelings, assist physical rehabilitation, give a positive effect on mood and emotional condition, improve memory, and provide a unique opportunity to interact and build emotional closeness. Therefore, music therapy can also help to deal with stress, prevent illness and reduce pain.[15]

The selection of classical music therapy is relevant to music characteristic that is non-dramatic, dynamically predictable, soft, harmonious tone and without lyrics at a tempo of 60-80 bpm (beat per minute) . Therefore, it is expected that listening to Mozart's classical music therapy can help reduce anxiety in inpartu mothers for caesarean[14].

The researcher concludes that the anxiety of mothers decrease after Mozart's classical music therapy, Sonata for Two Pianos in Major, Type 448. It occurs because classical music which has alpha and tetha frequency categories of 5,000-8,000 Hz can stimulate the body and mind to be relax so, it stimulates the brain to produce serotonin and endorphin hormones to make the body relax and make the heart rate stable. Serotonin is a chemical substance that transmits nerve impulses throughout the space between nerve cells or neurons and has a role to prevent anxiety, vomiting and migraines. Changes of serotonin level into melatonin hormone has a regulatory effect on relaxation, so it can improve mood, create a calm, relaxed, safe, or pleasant atmosphere to make patients feel comfortable[9,14].

## Conclusion

Based on the results and discussion in the previous chapter, it can be concluded that: Classical music therapy is effective to reduce anxiety of caesarean section mother at Syekh Yusuf Gowa Regional General Hospital.

**Acknowledgement**: The researcher would like to

thank the Rector of Makassar Megarezky University and the director of Sheikh Yusuf Gowa Regional General Hospital for his assistance throughout the study.

**Ethical Clearance:** obtained form university ethical committee

**Conflict of Interest** : None

**Source of Funding :** Self

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# Effectiveness of Baby Spa and Music Therapy on Growth and Development of Baby

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## Abstract

Providing a stimulus given shortly after the baby is born gives a very important effect for the development of children. In the development of a child, stimulation is a basic need and also plays an important role to develop. Dewanti,[1] revealed that baby spa is one form of nonverbal communication that can be done by the mother. This spa treatment is very beneficial for baby's health and development. Infants who have been treated with the spa will look fresh, healthy, vibrant and growth and development faster than infants who never did at all spa.

In addition to the baby spa, music therapy is also one therapy that can stimulate thinking, improve concentration and memory, and can improve the cognitive development of infants and children. Music therapy is an effort to improve physical and mental quality with sound stimuli consisting of melodies, rhythms, harmony, timbre, shapes and styles that are organized in such a way as to create useful music for mental and mental health[2].

This study was conducted to determine the development of infants through baby spa and music therapy, and useful as a follow-up to improve the growth and development of the baby so that the maximum. The population in this study is 6-12 months old baby with sampling using quota sampling technique with a sample of 60 babies. Quantitative quasi-experimental research method with the only posttest with control group design approach, where in the case group was given continuous intervention for 16 days while in the control group only 1 interval was given at the beginning of the meeting, at the end of the study the two groups will be measured the level and compared the results, with the General Linear Model Repeated Measures (GLM RM) test.

The result showed that the average of the first measurement scores in the lower case group was slightly lower than the control group that was 8.97 (SD = 0.928), while the mean score on the second measurement and the third measurement in the case group was higher than the control group 9.53 (SD = 0.776) and 9.80 (SD = 0.484). The result of the analysis with multivariate approach showed significant difference KPSP score for growth and development on the third level of measurement (p-value <0,007). Multivariate analysis can explain the variation of growth and development variable amount of 16,1%, there was a significant effect difference between case group and control group in improving growth and development score (p-value <0.000) amount of 44.7%.

***Keywords**: Baby spa, music therapy, the growth and development of the baby.*

## Introduction

Babies born already have a number of innate reflexes and an urge to explore the surrounding environment. Reflex occurs when the baby receives a stimulus or stimulation, because the baby is very sensitive to the

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environment and the stimulus given. Touch is one type of stimulation. This was stated by Widyastuti and Widyani (2008) where types of stimulation can be visual, auditory, kinetic and touch stimulation. Touch stimulation that has been given by the community to their children is by touch and massage[3].

Aspects of growth and development in children, today is one aspect that is taken seriously by experts, because it is an aspect that is very influential in the process of forming a person in the future to adulthood both physically and psychosocially[2]. In the development of a child, stimulation is a basic need and also plays an important role to be able to develop optimally. At the age of 1-3 months the baby also needs cuddles, touches and cradles of his parents, especially the mother[4].

Dewanti[5] revealed that the baby spa is one form of non-verbal communication that can be done by the mother. This spa treatment is very beneficial for baby's health and development. Infants who have been treated with spas will look fresh, healthy, vibrant and their growth and development are faster than babies who have never done a spa at all. According to Hammer and Turner in Soedjatmiko, baby spas are one tactile stimulation in infants that is a kind of sensory stimulation that is important for optimal infant development. These tactile stimuli can take the form of massaging or swimming. Nowadays, experts have been able to prove naturally about what is long known to man, namely touch therapy and massage in infants have many benefits to the physiological changes of the baby let alone carried out by the baby's mother. The mother is the person closest to the baby, where the mother's massage to her baby is a gentle sweep of the bonding of affection. Mother's skin is the earliest skin known to babies[1]. The results of research conducted by Suharto, there is an effect of baby stimulation in the form of massage, gymnastics and games on gross motor development of 3-8 months old infants, followed by research conducted by Dewi, et al, showing that babies who routinely do the majority of baby spas experiencing normal development, namely 86.7%[6].

Several studies have proven that music has a strong influence on human life. Experts argue that music affects human intelligence, physical, mental and emotional health. Such research was carried out by Dr. Alferd Tomatis and Don Campbell. They termed the "Mozart effect". Compared to other classical music compositions, melodies and high frequencies in Mozart's works are able to stimulate and empower creative and motivational areas in the brain[7].

## Materials and Method

The research design used a quasi-experiment with pre-posttest with control group design, where in the case group were given interventions continuously for 3 months, whereas in the control group only given intervention 1 (one) time at the beginning of the meeting, during the study the two groups would be measured the rate of growth and development every month for 3 times during posyandu visits and compared the results. The population and sample in the study were all 6-12 months old babies at Pondok Benda health center and Benda Baru health center in South Tangerang using a minimum sample of 30 respondents in the intervention group and 30 respondents in the control group in a total sample of 60 respondents. The analysis was carried out by testing the General Linear Model Repeated Measures (GLM RM).

## Results

Table 1 shows that the average age of respondents in both groups in the case group was 29.6 months and the control group was 29.2 months. The highest average parity group in the case group and control group was 2 people. The sex of the respondents with the largest proportion were men in both groups. The largest proportion of respondents' level of education is tertiary education, namely high school and PT in both groups and the largest proportion of maternal employment status does not work in both groups. Based on the history of exclusive breastfeeding the proportion of the majority said giving exclusive breastfeeding to the baby both in the intervention group and in the control group.

**Table 1. Description of characteristics respondents**

| Variable | Intervention group | | | | | | Control Group | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **mean** | **min** | **max** | **SD** | **SE** | **n** | **mean** | **min** | **max** | **SD** | **SE** | **n** |
| Age of mother (years) | 29.6 | 20 | 41 | 5.94 | 0.63 | 30 | 29.2 | 20 | 41 | 6.37 | 0.83 | 30 |
| Parity | 2 | 1 | 5 | 1.26 | 0.13 | 30 | 2 | 1 | 5 | 1.32 | 0.17 | 30 |

| Variable | Intervention Group | | | Control Group | | |
|---|---|---|---|---|---|---|
| | **f** | **Percentage** | **n** | **F** | **Percentage** | **n** |
| Sex of baby: | | | | | | |
| Girl | 12 | 40.0 | 30 | 13 | 43.3 | 30 |
| Boy | 18 | 60.0 | | 17 | 56.7 | |
| Qualification of mother: | | | | | | |
| Low | 1 | 1.1 | 30 | 4 | 13.3 | 30 |
| High | 29 | 98.9 | | 26 | 86.7 | |
| Mother's work: | | | | | | |
| Yes | 6 | 20.0 | 30 | 3 | 10.0 | 30 |
| No | 24 | 80.0 | | 27 | 90.0 | |
| Eksklusive breastfeeding: | | | | | | |
| No | 9 | 30.0 | 30 | 10 | 33.3 | 30 |
| Yes | 21 | 70.0 | | 20 | 66.7 | |

Table 2 shows the average value of growth and development of infants experiencing an increase in measurements I, II and III in the intervention group and tended to decrease in the control group. Statistical test results showed no differences in growth and development of infants between the intervention group and the control group at measurement I after 1 month of treatment (p value = 0.080), but there were differences in growth and development of infants in measurement II after 2 months of treatment ( p value = 0.044), and there are differences in growth and development of infants at measurement III after 3 months of of treatment (p value = 0.001).

**Table 2 Growth and Development of Babies in Measurements I, II and III**

**In the intervention group and control group**

| Variable | Intervention Group (n=30) | | Control Group(n=30) | | P value |
|---|---|---|---|---|---|
| | Mean | 95% CI | Mean | 95% CI | |
| Growth and development of babies: | | | | | |
| measurements I (after 1 month) | 8,97 | -0,850-0.050 | 9,37 | -0,850-0.050 | 0,080 |
| measurements II (after 2 months) | 9,53 | 0,011-0,789 | 9,13 | 0,011-0,789 | 0,044 |
| measurements III (after 3 months) | 9,80 | 0,377-0,957 | 9,13 | 0,377-0,957 | 0,001 |

The average of the first measurement scores in the intervention group was lower than the control group, which was 8.97 (SD = 0.928), while the average score in the second measurement and the third measurement in the intervention group was higher than the control group, which was 9.53 (SD = 0.776) and 9.80 (SD = 0.484). This can also be seen in the plot analysis as below:

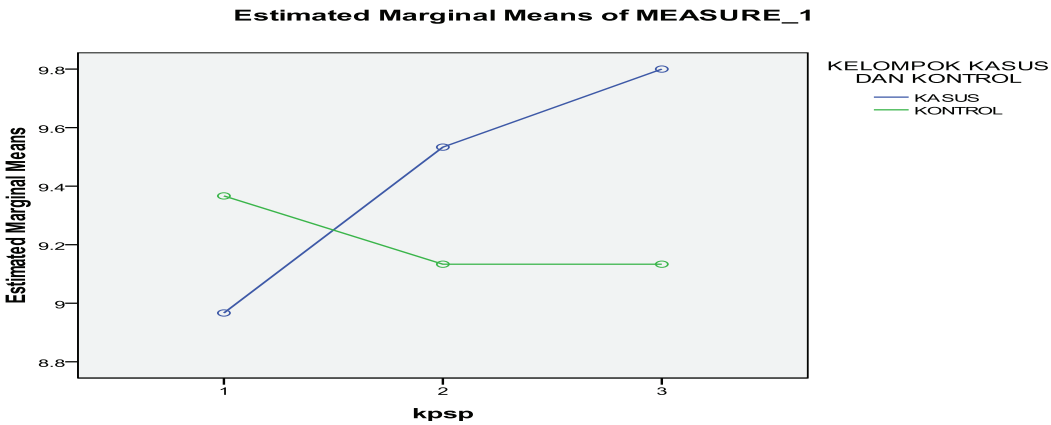


**Figure 1. Graph of interaction between measurement time and group on growth and development with KPSP form**

In general, the interaction analysis contained differences in growth and development between measurements (at month 1 and month 2 and month 3) between the intervention group and the control group (p value <0.001) with a power difference of 32.3%. The results of the analysis with the GLM-RM analysis approach showed that there was a significant difference in the score of KPSP for growth and development at the three measurement levels (p-value = 0.007), with a power of difference of 16.1%. Interaction analysis between the intervention group and the control group showed a significant difference in the effect of increasing growth and development scores (p-value = 0,000), with a strength of difference of 44.7%.

## Discussion

The results showed that the age of respondents in the two groups on average in the case group was 29.6 months and the control group was 29.2 months. The highest average parity group in the case group and control group was 2 people. The sex of the respondents with the

largest proportion were men in both groups. The largest proportion of respondents' level of education is tertiary education, namely high school and PT in both groups and the largest proportion of maternal employment status does not work in both groups. Based on the history of exclusive breastfeeding the proportion of the majority said giving exclusive breastfeeding to the baby both in the intervention group and in the control group. Based on the results of the study we can see that the characteristics of respondents in the intervention group and control group mostly have similarities.

Growth and development of infants during the intervention showed that the average value of growth and development of infants experienced an increase in measurements I, II and III in the intervention group and tended to decrease in the control group. There are differences in growth and development of infants in measurement II after 2 months of treatment (p value = 0.044), and there are differences in growth and development of infants at measurement III after 3 months of treatment (p value = 0.001).

In general, the interaction analysis contained differences in growth and development between measurements (at month 1 and month 2 and month 3) between the intervention group and the control group (p value <0.001) with a power difference of 32.3%, there was a significant difference in the score of KPSP for growth and development at all three levels of measurement (p-value = 0.007), with a strength of difference of 16.1%. Interaction analysis between the intervention group and the control group showed a significant difference in the effect of increasing growth and development scores (p-value = 0,000), with a strength of difference of 44.7%.

Based on the results above shows that the combination of baby spa and music therapy has an impact or influence on the growth and development of the baby. The combination of these two treatments produced a significant effect on the growth and development of the baby. Esti (2016) mentions in his research, Solus Per Aqua is a body treatment using water media. Babies or children who have been treated with a spa will look fresher, healthier, more vibrant[8].

According to Minister of Health Regulation No.1205 / Menkes / X / 2004, Solus Per Aqua is a traditional effort that uses a holistic approach, through comprehensive treatment using a combination of hydrotherapy (water therapy) and massage (massage) methods that are carried out in an integrated manner to balance the body, mind and feelings. The baby spa itself is having 2 treatments namely massage and also hydrotherapy. Which is where one of the treatments has a function as a medium that can stimulate the baby's motor movements. By playing water, the baby's muscles will develop very well, the joints grow optimally, body growth increases and the body becomes supple. The baby's motor skills will develop more rapidly than if he only plays on the floor, because when swimming in the water, the effects of gravity are very low. According to a study from the University of Science and Technology in Norway, babies who can swim have a better balance, and are able to reach objects around them more easily than babies who are not swimmers[9].

Based on the results above shows that the combination of baby spa and music therapy has an impact or influence on the growth and development of the baby. The combination of these two treatments produced a significant effect on the growth and development of the baby. Esti mentions in his research, Solus Per Aqua is a body treatment using water media. Babies or children who have been treated with a spa will look fresher, healthier, more vibrant. According to Minister of Health Regulation No.1205 / Menkes / X / 2004, Solus Per Aqua is a traditional effort that uses a holistic approach, through comprehensive treatment using a combination of hydrotherapy (water therapy) and massage (massage) methods that are carried out in an integrated manner to balance the body, mind and feelings. The baby spa itself is having 2 treatments namely massage and also hydrotherapy.

Regular massage can improve child growth and development. Research conducted by Schanberg in 1989 cited by Setyaningsih shows that touch, tactile or massage affect the production of enzyme ODC (ornithin decarboxylase), an enzyme that is a sensitive indicator of cell growth and tissue development, release of growth and development hormones[3].

In addition to baby massage and water therapy, another action combined in this study is music therapy. Baby music therapy can be an alternative to educate the

child's brain since he was still in the womb. Baby music therapy is indeed proven to affect baby growth later on. Children who have been playing music in the womb have higher intelligence, are easier in mathematics, have a stronger personality and more easily absorb many things that occur in their environment. This is because music for babies can balance the development of the right and left brain. Not only that, psychologically baby music therapy can bring the emotional connection between mother and child closer. Baby music therapy also affects the condition of the mother. Mothers can experience relaxation and calm themselves from activities when listening to music. This is certainly very good because mothers who are psychologically calm and furthest from stress will have a good impact on the child[10-12].

## Conclusion

The results obtained were significant differences between the measurements of resistance I, II, and II in infants carried out a combination of Baby Spa and music therapy. Based on the results of the study found a significant difference between stage I, II and II measurements between babies carried out combination of Baby Spa and therapy music with babies that is not done. The growth and Campball, Donald (2002). Efek Mozart Untuk Anak-Anak, Jakarta :PT.Gramedia Pustaka Utama.of infants in the group of infants who carried out the baby spa and music therapy regularly were higher than the group of babies that were not performed[8].

**Ethical Clearance**- Taken from University ethical committee.

**Source of Funding**- Self

**Conflict of Interest**– Nil

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# The Role of Kamoro Traditional Leaders in Communities Empowerment and Health in Mimika District

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## Abstract

This study uses a qualitative method. Researchers as research instruments, collect, process, analyze, interpret, and verify any data and information obtained from informants. Data obtained from participants is enriched, supplemented, and refined through in-depth and free interviews, to good informants who meet the requirements so that the validity and reliability of the data can be justified. The results of this study have shown that the role of Kamoro traditional leaders in community empowerment and health in Mimika Regency. Pioneering traditional leaders who marry programs of teaching traditional values into various aspects of life, increasing public interest in formal and informal education. These traditional leaders are also one of the bridges between the government and the community and also with the company, in this case PT. Freeport. The social interaction of traditional leaders with the government and other community leaders in the context of empowering and improving public health in rural areas, is done through social contact and communication through various channels, both formal and informal, both with the community or with other regional leaders such as the government.This traditional figure has played a role in providing an understanding of the concept of empowerment to the community where they have also been involved as members of community organizations Angmume and Kamoro community development institutions which are present as institutions for community empowerment and health protection. Giving an understanding of empowerment is conveyed in a conceptual framework according to the Kamoro tribal culture approach. In relation to empowerment, related to the problem of stages in the representation of adat in the form of programs, and the higher the stages (local, regional and national), the empowerment perspective is broader and does not go directly to technical issues.

***Keywords****: Role of Customary Leaders, empowerment, agent of change, work ethic, health*

## Introduction

Changes in socio-economic opportunities in various sectors of life in the Kamoro tribe as one of the products of accelerating modernization that are difficult to avoid, apparently cannot be captured and examined equally among the people. This is caused by differences in abilities, education, attitudes, and tempo of adjustment to developing phenomena or new symptoms in modern life so that it becomes a major factor causing socio-cultural inequality both in general society but also for Kamoro people in Mimika Regency.

The gap in ability to overcome difficulties and life challenges faced by one group with other groups in society, tends to cause differences in attitudes between the groups. Besides that, the unequal contribution of ownership and control of living facilities can also threaten the continuity of emotional solidity that has been well established within a community. These differences led to the growth of conflict and dichotomy between sub-groups and between groups themselves in the community in the Mimika area.

In this context, the government and PT Freeport through the Amungme and Kamoro Community Development Institute (LPMAK), have involved many

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community leaders or traditional leaders to oversee various community empowerment programs, hoping that they can be more effective in the implementation process. Community empowerment in this case is more directed at disadvantaged communities through efforts to change social structure (realocation of power), so that the community is expected to be able to master their lives by understanding and implementing the concepts of self-help, participation (participation) participation), net working, and equity[1-4]

Meanwhile the reality that exists at the level of rural communities in the Kamoro tribal region, is still far from what is expected to change. This is where the role of community leaders and local elites turned out to be quite effective in influencing the lives of the people themselves, both in the social, economic and political fields. The elite group, among others, work as officials or officials of the local government and community leaders, and one of the community leaders who have a strategic role in this case is the community leader. Community leaders in the Kamoro tribe are figures who have important and central positions in the community, their position is related to their position as educated people and has more wealth economically compared to the economic life of other general public, so that if there is a problem this traditional leader can provide a solution. As elites, traditional leaders provide knowledge to the inhabitants of the village, and with the wealth they have, traditional leaders always become a patron to anyone and there are many villagers who depend on and hope for these traditional leaders.[5-7]

## Materials and Method

### Research Design

This research uses a case study approach with the aim of examining Kamoro traditional leaders in Timka in its activities to empower the community. The study was conducted through qualitative methods that focused on cultural research with participatory methods. The qualitative method contains the meaning of a description of the data using words and sentence lines. Qualitative research aims to understand a social situation, events, roles, interactions, and groups. The study was carried out in stages by understanding social phenomena by differentiating, comparing, cataloging, and grouping study objects.

### Data source

The research data were sourced from informants, namely data from interviews with the main actors, both from the ulama and from rural communities related to the empowerment program. While secondary data sourced from articles, literature studies, documents, statistical data, archives from the government and private parties, as well as mass media.

### Informant

Informants are people who provide data and or information in the form of words or actions, and know and understand the problem being investigated. Informants are obtained according to specific objectives, meaning that selected informants who meet the requirements based on the characteristics of the research objective.

## Results and Discussion

The Role of Kamoro Indigenous People in Customary Institutions The first pillar concerns aspects of the use-value customs for the economic development of the Kamoro people to answer the challenges of meeting the economic needs of the community. The second pillar concerns the survival aspect of the socio-cultural identity of the people which supports the integration of the Kamoro people but also as Papuans and the National people so that the outside world can also get to know the Kamoro people. The third pillar deals with the ability of the community to carry out the organization of potential customs and socio-cultural values in an autonomous, independent and professional manner.

The Objectives of the Kamoro Indigenous Peoples Institutions in general are, the Preservation and Development Program of Kamoro customs and the socio-cultural values of the Kamoro people that aims to preserve and develop local customs and cultural values, especially in the existing local arts and culture.

Besides the general objectives, they also have a specific purpose, namely; a.) Increase community participation in the assessment of the socio-cultural potential of the community (especially in the field of local art and culture) as a social capital for development, as well as mapping opportunities and threats in the framework of planning, implementing, controlling, evaluating and following up and taking responsibility

for rural community development activities; b) Empowering community groups developing local art and culture, especially in the context of improving the welfare of these groups in an effort to continue to preserve the said cultural arts, through the development of appropriate productive economic ventures. c) Support the development of the Kamoro regional culture that can compete with other cultures in bringing economic value to the Kamoro tribe residents to achieve an increase in the quality of sustainable cultural resilience and develop the tourism economic sector going forward.

Development of indigenous potential in the Kamoro community

There are a number of roles played by Kamoro adat leaders in Mimika Regency in providing an understanding of empowerment to the community, through the following: Changing the Kamoro People's View of Social Change. The views of Philip, et al[7] factors that influence social change, namely because of the driving factors and inhibiting factors of social change. The driving factor is a factor that encourages and triggers social change, while the inhibiting factor is a factor that inhibits or complicates social change. These driving factors can occur from the community and factors from outside the community concerned.

Questions related to the above aspects are addressed to the traditional leader of Acting Chairperson Lemasko, Gergorius Okuare in February 2020 in a meeting which was also attended by the author, according to him related to the question whether social change also influences the cultural and health changes of the Kamoro community; For Kamoro people themselves, we always follow the changes that occur, but in those changes we still respect our cultural values. The Kamoro people have seasons and climate in the Kamoro adat area and for a long time we Kamoro people have made peace with our nature.

**Protecting the Environment & Culture**

The universe has its own meaning for the lives of our people, especially inland communities. Nature is like a mother who always accompanies and accompanies the lives of her people, nature always accompanies, each tradition is so united with the pattern of life. Alignment becomes evidence or a real sign of every set of daily needs. Nature is still a sign to share. The shade of trees as a hue and a complement in the process of life blend and coexist. Proof of creating harmony. Formation based on true stories, steps and life seems to grow in harmony. The close relationship between culture and the environment is very clear to indigenous peoples.

Questions relating to the above aspects are addressed to other Lemasko traditional leaders namely, Dominikus Mitoro, in the same month namely February 2020 in a meeting he said that;

"The existence of the Komoro indigenous territories has been completely eroded apart from the garbage disposal by PT Freeport, but also many investors who entered the Kamoro area they encroached on our forests, our sago hamlets, our mangrove forests which are the source of our lives, The question is whether we Kamoro adat institutions can save our environment that is still separated from this life. That is why our role here is to provide counseling to the Kamoro community so that every investor who enters the traditional Kamoro area must get the blessing or permission from our institution. Even though in the past our land, our hamlet, everything we owned was taken by all those who entered our area, but we still have hope even though it is small, we want to protect our village.

This is the task of our indigenous community institution. "The Kamoro tribe is also known as a tribe that has a high ability in terms of sculpture. A National Geographic publication. stated that: In their daily life, Kamoro tribe residents used to make various types of carvings, for various purposes. Shields, paddles, sago bowls, drums and other everyday items, they make them so beautifully. In addition they also make special carvings. Wemawe, a statue in the form of a human and mbitoro, totems made for ancestors, is the creation of Kamoro carving artists that are difficult to find in the world. All these carvings they made with two purposes: for the traditional ceremony and also for them to sell.

Preparing Kamoro Tribe Human Resources National development policy by adhering to Law Number 22 Year 1999 concerning Regional Autonomy brings strategic changes to the quality of Human Resources that each region needs to be able to compete positively with other regions in Indonesia. Various efforts need to be made to realize the quality of Human Resources. Education is

one of the main efforts to imply these desires, but it also requires a long time and large costs. Various types and levels of education offered by the government. Improving the quality of human resources is the responsibility of all parties. Thus, development in education is one of the successes of a country / region.[8-10]

The Kamoro tribe community also faces problems faced by Kamoro tribes today, he said, ranging from minimal household economic capacity, not to mention the customs and cultural habits that prevent a person from being able to progress and develop. One example of the case, he said, was that Kamoro residents had a habit of living in a nomadic life (kapiri kame) to collect food supplies provided by nature because of their pattern of living as gatherers. "There are many Kamoro people's habits that are not so easily removed, such as closeness to children. Children are always taken away from the village to look for fish and sago," he said. As a result, children cannot go to school. Children should be left independent and encouraged by parents to go to school.

The question is how is Lemasko's role in overcoming, increasing and preparing Kamoro human resources? Following is the answer;

"The urgency of developing Kamoro's human resources is a key factor in winning global competition at this time, so we Lemasko also does not remain silent. This is our consequence as an adat institution that we realize will be increasingly intense competition amid uncertainty. So that the strategic steps that have also received full support from all stakeholders. Besides that, strengthening the Kamoro tribe human resources who also want to lead to superior humans has a close correlation with improving the quality of the children of the young Kamoro tribe. At one time the Kamoro children could also win the competition amid the rapid changes in the world of business, political economy and culture.

The commitment and realization that we have done is that as traditional leaders of the Kamoro community we have utilized the one percent budget funds provided by PT Freeport so that in strengthening human resources through the program which we have encouraged the Amungme and Kamoro community development agencies to increase the annual budget allocation in the field of education, health so that the funds financed can have an impact on the development of human quality that continues to move up and can be put to good use by the Kamora children. We as Kamoro traditional leaders have planned in the work program of our traditional institutions that natural resources and human resources are the most important and most strategic factors in developing prosperity, as well as the success in building our better society.

**Understanding independence**

Understanding Independence according to Masrun[11], independence is an attitude that allows someone to act freely, do something on their own and for their own needs without help from others, or think and act original / creative, and full of initiative, able to influence environment, have confidence and get satisfaction from their business. Self-understanding means being able to act according to circumstances without asking or depending on others. Independent is where a person wants and is able to realize his own desires / desires which are seen in real actions / actions in order to produce something (goods / services) for the fulfillment of his life needs and his fellow man. Every activity carried out by someone in order to succeed according to his wishes, then it requires a strong independence[12].

**Self-Awareness**

In community empowerment is inseparable from the awareness of independence where Community Empowerment Strategies There are three main strategies of community empowerment in the practice of social change, namely traditional, direct action, and transformation which are described as follows: Traditional strategy, Direct strategy -action and transformative strategy.

***Responses to questions by Mr. Robertus Waraopea, are also the chairman of Lemasko and the chairman of the LPMAK Management Board;***

"In this section what the Kamoro traditional leaders do is how they use the 3 approaches above, namely; traditional approach, direct action or direct approach and transformative strategy in fostering the independence of the Kamoro tribe community. According to the results of the interview that if this traditional institution encourages the three approaches above, in community

empowerment it is certain that the Kamoro community will be independent and prosperous.

**Ethical Clearance** - Taken from University ethical clearance committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

## Conclusion

It can be concluded that in playing its role as Kamoro traditional figure, it can encourage the community to be able to plan, implement and oversee the running of programs for the benefit of social, health, education and economic life in the Kamoro, Mimika community.

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# Effect of Brown Algae Extract Sargassum sp on Malondialdehyde Levels in White Rats (Rattus Norvegicus) Pregnant Wistar Strains

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## Abstract

Pregnancy is an inflammatory condition that produces unstable oxidative stress and can damage macroeconomic tissue including DNA and protein which disrupt the placentation process. Increased levels of malondialdehyde as an indicator of lipid peroxidation and decreased levels of antioxidants. This research was conducted experimentally with pretest-posttest Control Group Design. Using three treatment groups for the white rat (Rattus Norvegicus) test for Pregnant Wistar Strains. Twenty-one samples consisted of three groups (Group 1 negative control, Group 2: sea algae extract Sargassum sp dose 300 mg/kg bb/day, Group 3: sea algae extract Sargassum sp dose 600 mg/kg bb/day. Malondialdehyde levels were determined by examination Eliza sandwich The results showed that Sargassum Sp brown algae extract had a significant effect on decreasing levels of malondialdehyde (300mg p: 0.008 dose; 600mg p: 0.001 dose) in white rats (Rattus norvegicus) Pregnant Wistar Strains.

***Keywords:*** *Sargassum sp, Malondialdehyde, Rattus norvegicus.*

## Introduction

In pregnancy will increase, increase, increase. Oxidative stress that occurs can occur because antioxidants do not compensate. Therefore, under certain conditions triggered by oxidative stress, endogenous antioxidants become insufficient and require exogenous antioxidants to maintain optimal cellular function.

Malondialdehyde (MDA) levels in pregnant women are higher than in nonpregnant women. Increasing MDA levels increase with increasing gestational age from the first, second and third trimesters, in this case, there has been an increase in peroxidation which is a marker (marker) to increase free radicals in the blood[1]. Oxidative stress will disrupt the placentation process. Abnormalities associated with certain diseases for example preeclampsia, mola hydatidosis, and abortion. Increased risk of failure associated with increased free radicals that increase in the development of placental function and effect on the fetus[2]. The increase in oxidative stress corresponds to an increase in lipid peroxidation formation. Oxidative stress will cause damage to trophoblast cells which will start to become abortion (miscarriage).

Reactive oxygen species (ROS) can be obtained endogenously or exogenously but both can affect oocytes and embryos and can also cause oxidative DNA damage which increases the speed of mutagenesis and chromosomal instability[3]. Mitochondrial dysfunction by stress or improper mitochondrial integrity control causes an increase in electron leakage from the respiratory chain. Very reactive superoxide causes itself to be very unstable. This can damage the different macromolecules in the mitochondria including fats, proteins, and DNA that can affect mitochondrial function and stimulate extensive electron leakage and ROS production[4].

Brown algae Sargassum sp has the highest antioxidant activity compared to red and green seaweed and the main antioxidant component found in Sargassum sp is a polyphenol compound[5]. Most compounds in the brown algae Sargassum sp are carotenoids which act as antioxidant activities. The ability of polyphenols as antioxidants is based on the presence of hydroxyl groups which are aromatic compounds as contributors to hydrogen atoms for free radicals and the ability of electron delocalization which has a double bond for conjugation, as well as the stability of the resonance structure[6].

## Materials and Method

This study used a simple randomized design method using three groups of test animals of white rat (Rattus norvegicus) strains of pregnant Wistar and were treated as follows:

a. Negative Control Group (Group 1): mice were only given distilled water on days 7-19 of pregnancy with a frequency of 1 time per day.

b. Treatment group 1 (Group 2): rats were given seaweed extract Sargassum sp on days 7-19 of pregnancy with a dose of 300 mg/kg rat frequency 1 time per day

c. Treatment group 2 (Group 3): rats were given seaweed extract Sargassum sp on days 7-19 of pregnancy with a dose of 600 mg/kg rat frequency 1 time per day.

In this study, the sample was adjusted to the inclusion criteria, while the prospective white rat (Rattus norvegicus) strain of female Wistar with a bodyweight of 200-250 grams with age 3-4 months. Female mice were mated with male rats during the estrous phase with a system of one female and one male partner for 24 hours which had previously been examined by vaginal smears to confirm the lust phase of the estrus period(7). The next day the female rat was examined to ensure marriage by checking vaginal smears containing much sperm and examined signs of pregnancy such as signs of plugs (vaginal redness, swelling and thick lumps in the vaginal introitus) which were stated as the first day of pregnancy. The cage is placed at room temperature using 12 hours of bright lighting and 12 hours of darkness, as well as maintaining the humidity of the room. Each rat was given once a day according to the treatment set.

The three groups of test animals, each consisting of seven white rats (Rattus norvegicus) strains of pregnant Wistar, were examined for Malondialdehyde levels on the 7th day of pregnancy as a pre-test examination, and given the intervention of brown algae extract Sargassum sp in both treatment groups according to the dose of treatment predetermined and negative control groups are only given equates once a day. The treatment began on the 7th day until the 19th day. Furthermore, on the 19th day, the level of malondialdehyde was examined as a post-test.

All conditions and handling of test animals are carried out by following a protocol approved by the medical research ethics committee of the Faculty of Medicine, University of Hasanuddin, number: No.199 / UN4.6.4.5.31 / PP36 / 2019.

Manufacture of Sargassum sp brown algae extract

The tools needed for the manufacture of Sargassum sp brown algae extracts are trash, blender, 30 mesh sieve, scales, stirrer, 1-liter tube, filter paper, Erlenmeyer flask, measuring flask and rotary evaporator, while the material for extracting is Sargassum sp. water, and ethanol 96%. Sargassum sp brown algae powder which has been mashed in maceration with 96% ethanol solvent, then allowed to stand for 3 days but still stirring every day. The ethanol extract is then stored in the Ellen Meyer flask to be evaporated with a Rotary vacuum evaporator at 40°C to produce a familiar extract (concentrated) with a constant weight.

Measurement of malondialdehyde levels using an enzyme-linked immunosorbent assay (ELISA) sandwich technique.

Prepare all reagents (standard, control) and samples. Prepare a strip well that is conditioned at room temperature for ± 30 minutes. Add 50 µl of standard solution to well A1-A6. Add 40 µl of serum to the well and then add 10 µl of anti-MDA antibody to the wells. Add 50 µl of streptavidin-HRP each to the sample well and standard well. Cover well with seal. Incubate at 37°C for 60 minutes. Remove the seal and wash the plate with buffer washing 5 times. Add 50 µl of substrate A solution to each well then add 50 µl of substrate B solution to the well (standard and sample). Cover the plate with a seal. Incubate at 37°C for 10 minutes. Add 50 µl stop solution

into the well (standard and sample), there will be a color change from blue to yellow. Measure the optical density (OD value) of each well using a microplate reader using a wavelength of 450 nm within 10 minutes after stopping adding solutions.

## Results

a. Malondialdehyde (MDA) levels in white rats (Rattus norvegicus) pre and post-test strains of pregnant women by a group.

MDA levels at the lowest pre-test were found in the negative control group (0.26 ± 0.11 nmol / ml) compared to the Sargassum sp extract group with a dose of 300 mg / kgBB / day (0.43 ± 0.10 nmol / mL) and Sargassum sp extract group dose 600 mg / kgBB / day (0.41 ± 0.07 nmol / mL). At the post test, the lowest MDA level was found in the Sargassum sp extract group at a dose of 600 mg / kgBB / day (0.25 ± 0.10)) nmol / mL) compared to the Sargassum sp extract group at a dose of 300 mg / kgBB / day (0, 40 ± 0.12 nmol / mL) and negative control group (0.41 ± 0.06 nmol / mL) (Table. 1).

**Table 1. Malondialdehyde (MDA) levels in white rats (Rattus norvegicus) Pregnant Wistar Strains Pre and Post Test by Group**

| Group | n | MDA levels (nmol / mL) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Pre Test | | Post Test | | Change | |
| | | Mean (SD) | Median (Min-Max) | Mean (SD) | Median (Min-Max) | Mean (SD) | Median (Min-Max) |
| Negative Control | 7 | 0,26 (0,11) | 0,27 (0,10–0,38) | 0,41 (0,06) | 0,43 (0,28–0,45) | 0,14 (0,11) | 0,11 0,03 – 0,35) |
| Sargassum sp 300 mg dose | 7 | 0,43 (0,10) | 0,45 (0,25 –0,60) | 0,40 (0,12) | 0,43 (0,15–0,51) | -0,03 (0,10) | 0,02 (-0,1 – 0,08) |
| Sargassum sp 600 mg dose | 7 | 0,41 (0,07) | 0,41 (0,32 –0,50) | 0,25 (0,10) | 0,22 (0,11 –0,42) | -0,15 (0,12) | -0,2 (-0,2 –0,1) |

b. Differences in levels of malondialdehyde (MDA) in white rats (Rattus norvegicus) strains of pre and post-test pregnant Wistar by group

MDA levels in the negative control group increased 0.14 ± 0.11 nmol / mL and based on the results of the Pairet T-Test statistic, there was a significant difference in the increase in MDA levels in white rats (Rattus norvegicus) strains of pregnant Wistar between pre-test and post-test (p: 0.012).The MDA levels in the Sargassum sp extract group at a dose of 300 mg/kg bb/ day decreased 0.03 ± 0.10 nmol/mL.While the MDA levels in the Sargassum sp extract group dose 600 mg/ kg bb/day there was a decrease of 0.15 ± 0.12 nmol / mL and based on the results of the Pairet T-Test statistic it was found that there was a significant difference in the decrease in MDA levels in white rats (Rattus norvegicus) strains of pregnant Wistar between pre-test and post-test (p: 0.019) (table.2)

**Table 2. Differences in levels of Malondialdehyde (MDA) in White Rats**

(Rattus norvegicus) Pregnant Wistar Pre and Post Test Strains Based on group

| Group | Time | N | MDA levels (nmol / mL) | | p-Value |
|---|---|---|---|---|---|
| | | | Mean (SD) | | |
| | | | Score | Change | |
| Negative Control | Pre Test<br>Post Test | 7<br>7 | 0,26 (0,11)<br>0,41 (0,06) | 0,14 (0,11) | 0,012 |
| Sargassum sp 300 mg dose | Pre Test<br>Post Test | 7<br>7 | 0,43 (0,10)<br>0,40 (0,12) | -0,03 (0,10) | 0,425 |
| Sargassum sp 600 mg dose | Pre Test<br>Post Test | 7<br>7 | 0,41 (0,07)<br>0,25 (0,10) | -0,15 (0,12) | 0,019 |

c. Differences in levels of malondialdehyde (MDA) in white rats (Rattus norvegicus) strains of pregnant Wistar between groups

Based on the results of the Independent statistical test sample t-test, there was a significant difference in changes in MDA levels between the negative control group and the Sargassum sp extract group dose 300 mg/kg bb/day (p: 0.008), there was a significant difference in changes in MDA levels between the negative control group and the extract group Sargassum sp dose 600 mg/kg bb/day (p: 0.001), and there was no difference in changes in MDA levels between the Sargassum sp dose 300 mg/kg bb/day and Sargassum sp extract group dose 600 mg/kg bb/day (p: 0.072) (table.3)

**Table 3. The difference in levels of malondialdehyde (MDA) in White Rats**

**(Rattus norvegicus) Intergroup Pregnant Wistar Strains**

| Group | n | Change in MDA levels (nmol / mL) | | p-Value* |
|---|---|---|---|---|
| | | Mean (SD) | | |
| | | Score | Change | |
| Negative Control<br>Sargassum sp 300 mg dose | 7<br>7 | 0,14 (0,11)<br>-0,03 (0,10) | 0,18 (0,05) | 0,008 |
| Negative Control<br>Sargassum sp 600 mg dose | 7<br>7 | 0,14 (0,11)<br>-0,15 (0,12) | 0,30 (0,06) | 0,001 |
| Sargassum sp 300 mg dose<br>Sargassum sp 600 mg dose | 7<br>7 | -0,03 (0,10)<br>-0,15 (0,12) | 0,12 (0,06) | 0,072 |

## Discussion

The results of this study found that administration of Sargassum Sp brown algae extract had a significant effect on decreasing levels of malondialdehyde (MDA) in white rats (Rattus norvegicus) strains of pregnant Wistar at a dose of 300 mg/kg bb/day (p: 0.008) and a dose of 600 mg/kg bb/day (p: 0.001) compared to the negative control that had increased. This indicates that the brown algae Sargassum sp at a dose of 300 mg/kg bb and 600 mg/kg bb gave a positive effect on the decrease in levels of malondialdehyde in pregnant Wistar strain white rats.

The content of bioactive compounds than brown algae Sargassum sp is a flavonoid compound that directly reacts with free radicals by capturing unpaired electrons to free radicals without producing other free radicals as a result of the reaction[8]. Flavonoids can inhibit initiation by capturing major radicals such as superoxide. The effects of flavonoids on ROS are through two mechanisms by increasing endogenous antioxidants and capturing free radicals or neutralizing free radicals[9].

The flavonoid groups identified in the Sargassum sp extract are catechins and quercetin[10]. These two groups of flavonoids are thought to have a role to ward off free radicals so that they can reduce levels of malondialdehyde in the white rat group of pregnant Wistar strains that have been treated. Quercetin is a flavonoid compound that has the most powerful antiradical properties against hydroxyl radicals, peroxyl and superoxide anions[11].Flavonoids protect cells from attack by reactive oxygen compounds such as singlet oxygen, superoxide, peroxyl radicals, hydroxyl radicals, and peroxynitrite. Lipid damage occurs through three phases, namely the initiation, propagation and the termination stage which is the final stage by binding a free radical with other free radicals so that they are no longer reactive[12].When a hydrogen atom is removed by a molecular lipid some compounds will react with a hydrogen atom that forms hydroxyl radicals (●OH),alkoxy (RO),peroxyl (ROO) and possibly also with HO2 but not including H2O2.Membrane lipids are phospholipids consisting of unsaturated fatty acids that facilitate peroxidation due to the presence of hydrogen atoms containing only one electron, in this case, there is a carbon atom without electron pairs. The double bonds in fatty acids will weaken the CH bonds in carbon atoms adjacent to the double bonds which makes it easy for hydrogen atoms to transfer. Likewise, if there are sufficient oxygen concentration of lipid radicals, it will react with oxygen to form peroxyl radicals (ROO●),this stage occurs in propagation. For the termination stage, peroxyl radicals (ROO●) will attack other hydrogen atoms originating from other lipid molecules that are close and produce lipid peroxides and peroxyl radicals or interact with other antioxidants. Therefore this process causes the cessation of the oxidation process by neutralizing free radicals that are formed during oxidation.

This study shows that in test animals with control groups there was a significant increase in malondialdehyde levels between pre-test and post-test (p: 0.012).This illustrates that in pregnancy two phenomenological oxidative stress phenomena are found, which occur in the trimester in the peripheral part of the placenta.Therefore there is an increase in local oxygen concentration at a stage of pregnancy so that the trophoblast has a concentration and activity of major or endogenous antioxidants such as superoxide dismutase (SOD) is low[13]. The presence of major trophoblastic oxidative damage and progressive degeneration of the villi will trigger the formation of the fetal membrane which is an important developmental step for vaginal delivery.

## Conclusion

Based on research conducted found Sargassum Sp brown algae extract gives a significant effect on decreasing levels of malondialdehyde (MDA) in white rats (Rattus norvegicus) pregnant Wistar strains at a dose of 300 mg/kg bb/day and a dose of 600 mg/kg bb/day.

**Ethical Clearance**- Taken from Medical Faculty ethical committee

**Source of Funding**- Self

**Conflict of Interest** - Nil

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# Factors Corresponded to Health Service Utilization of Chronic Disease Management Program (Prolanis) Patient in Health Center Lateri Ambon City Post-Earthquake

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## Abstract

The objective of chronic disease management Program (Prolanis) encourages patient with chronic illness to achieve optimal quality of life and 75% of patient have the "good" results on the specific examination of the disease DM type II and hypertension so as to prevent the onset of disease complications. The purpose of this research is to know the factors related to the utilization of post-earthquake service Prolanis. This type of research is analytic survey research using cross sectional approach design. The population in this study is all prolanis patient who utilize the service in the Public Health center after the earthquake as many as 69 patient. The sampling techniques in this study were the total sampling so that the number of samples in this study of 69 respondents showed that there was no age-old relationship with the utilization of Prolanis services in post-earthquake community health centres (P = 0,271) However, there was a gender relationship (0.000), education (P = 002), and marital status (P = 0,006). Therefore, the Lateri Public Health Center can play an active role and reach out to prolanis patient who utilize the post-earthquake service so that they can maintain and increase the degree of health especially in people with chronic diseases such as hypotensions and diabetes mellitus.

***Keywords**: Prolanis, utilization, post-earthquake, Public health Center*

## Introduction

The Chronic Disease Management Program (Prolanis) is an integrated healthcare system and proactive approach that involves patient, health facilities and BPJS healthcare in order to maintain health care for the optimal patient of BPJS Health with the cost of effective and efficient health services. The target of Prolanis activities are all patient of BPJS health with chronic disease especially Diabetes Mellitus (DM) type II and hypertension. This is carried out by first-rate health facilities (FKTP) both in government FKTP and private FKTP. Prolanis aims to encourage patient with chronic illness to achieve optimal quality of life and 75% of patient have the "good" results on the specific examination of the disease of DM type II and hypertension so as to prevent the onset of disease complications.[1]

The number of sufferers of Diabetes mellitus type 2 continues to increase in Indonesia. Based on RISKESDAS 2018 the prevalence of Diabetes mellitus in population aged > 15 years for Indonesia is 2.0%. In addition to diabetes mellitus type, hypertension is also a burden of non-infectious diseases that are harmful because of its effects that can spread to other diseases. The prevalence rate of hypertension based on the measurements in population aged ≥ 18 years in regional health research 2018 increased sharply by 34.1%. [2]

Based on secondary data at the Leteri Public Health center obtained by researchers, the number of pronalists patient registered in Leteri Public health centers as many

as 134 patient and who utilize prolanis services from January to October 2019 as many as 69 patient per month. [3] in November 2019 until December 2019 there was a decrease in the number of visits in each month as many as 69 patient in 40 patient. The decline in the number of visits occurred in the aftermath of the earthquake that occurred in September 2019 in the city of Ambon caused many people to evacuate so as not to utilize the service of Prolanis in the Lateri Community Health Center. By the time this research aims to determine what factors influence the utilization of the service of Prolanis patient in the health center post earthquake Lateri society

## Materials and Method

The type of research used is an analytical survey using the design of a cross sectional approach. The population in this study is all prolanis patient who utilize the service in the Public Health care center after the earthquake as many as 69 patient. The sampling technique in this study was a total sampling so the number of samples in this study was 69 respondents. Data collection is obtained through a live

## Results

According to table 1, it is revealed that from 69 respondents based on the respondent's age, most of the age group > 60 years as many as 37 respondents (53.7%) And the least number of respondents in the age group of 41-50 years as many as 2 respondents or amounting to (2.9%). According to gender, respondents were the most female groups of 53 people (76.8%) And the fewest number of respondents in males is as much as 16 people (23.2%). Based on the most recent education is the category SMA/equal to 28 people (40.6%) And the least number of respondents were the group did not end the elementary school as much as 2 people (2.9%). Based on the marital status, the most widely married category of 53 people (76.8%) And the fewest number of respondents were not married for 2 people (2.9%)

**Table 1. Distribution of Respondents Based on the Characteristics of Respondents from Prolanis patient in the lateri health center post-earthquake in 2020**

| **Push Factor** | **Number (n)** | **Percent (%)** |
|---|---|---|
| a. Age (yr) | | |
| 30-40 | 20 | 28.9 |
| 41-50 | 2 | 2.9 |
| 51-60 | 10 | 14.5 |
| > 60 | 37 | 53.7 |
| Total | 69 | 100 |
| b. Gender | | |
| Male | 16 | 23.2 |
| Female | 53 | 76.8 |
| Total | 54 | 100 |
| c. Education | | |
| Not completed in primary school | 2 | 2,9 |
| Graduated from elementary school | 4 | 5.8 |
| Graduated from middle school | 6 | 8.7 |
| Graduated from high school / vocational school | 28 | 40.6 |
| D3 | 19 | 27.5 |
| Graduated from college | 10 | 14.5 |
| Total | 69 | 100 |

***Cont...*** **Table 1. Distribution of Respondents Based on the Characteristics of Respondents from Prolanis patient in the lateri health center post-earthquake in 2020**

| | | |
|---|---|---|
| d. Marital status | | |
| Marry | 53 | 76.8 |
| Divorce | 14 | 20.3 |
| Single | 2 | 2,9 |
| **Total** | **69** | **100** |

Source: Primary Data, 2020

**Factors related to the utilization of Prolanis patient service in the Lateri Health center of Post-earthquake**

The results of the analysis of the influence of individual characteristics of age, sex and last education of the officer's performance can be seen in table 2

**Table 2. Factors related to Utilization of Prolanis patient Services at the Lateri community health center Post-Earthquake**

| **Research variable** | **Utilization** | | | | **amount** | | **p** |
|---|---|---|---|---|---|---|---|
| | **Make use of** | | **Underutilizing** | | | | |
| | **n** | **%** | **n** | **%** | **N** | **%** | |
| Age Group (year) | | | | | | | 0.271 |
| Adult | 23 | 71.9 | 9 | 28.1 | 32 | 100 | |
| Elderly | 31 | 83.8 | 6 | 16.3 | 37 | 100 | |
| amount | 54 | 78.3 | 15 | 21.7 | 69 | 100 | |
| Gender | | | | | | | 0,000 |
| Male | 6 | 37.5 | 10 | 62.5 | 16 | 100 | |
| Girl | 47 | 90.6 | 6 | 9.4 | 53 | 100 | |
| amount | 54 | 78.3 | 15 | 21.7 | 69 | 100 | |
| Education | | | | | | | 0.002 |
| Basic | 3 | 50 | 3 | 10 | 6 | 100 | |
| Advanced | 51 | 81 | 12 | 19 | 63 | 100 | |
| amount | 54 | 78.3 | 15 | 21.7 | 69 | 100 | |
| Marital status | | | | | | | 0.006 |
| Married | 43 | 81.1 | 10 | 18.9 | 53 | 100 | |
| Not married / divorced | 11 | 68.8 | 5 | 31.2 | 16 | 100 | |
| amount | 54 | 78.3 | 15 | 21.7 | 69 | 100 | |

Source: Primary Data, 2020

Table 2 shows that out of the 32 respondents who have grouped adult categories, there are 23 respondents (71.9%) That utilize the Prolanis health services in the Lateri Public Health center well and 9 respondents (28.1%) Who undertakes the use of medical services in the Lateri Public health center while from 37 respondents grouped by elderly there are 31 respondents (83.8%) Who utilize the Prolanis service in the Lateri Public health Center and 6 respondents (16.2%) Who undertakes the Prolanis service at the Public Health center of Post-earthquake. Statistical test results using the chi-square test obtained the value P = 0.271, because the value of p > 0.05 then there is no age group relationship to the utilization of the service patient in the Post Earthquake.

According to category of gender shows that of 16 respondents who have male gender, there are 6 respondents (37.5%) Utilizing the Prolanis Health Care Center in the Lateri Public health Centre and 10 respondents (62.5%) Who undertakes the use of medical services in the Lateri Public health center while 53 female respondents are 47 respondents (90.6%) Who utilize the Prolanis service in the Lateri Public health Center and 6 respondents (9.4%) Who undertakes the service of Prolanis at the Lateri Public Health Center. Statistical test results using the chi-square test obtained the value P = 0.000, because the value of p < 0.05 then there is a gender relation to the utilization of the service of the patient in the post-Earthquake Department center.

Based on the education category shows that out of 6 basic educated respondents, there were 3 respondents (50%) That utilize the Prolanis health services in the Lateri Public Health center well and 3 respondents (50%) Who undertakes the use of medical services in the Lateri Public health center while from 63 further educated respondents there are 51 respondents (81%) Who utilize the Prolanis service in the Lateri Public health Center and 12 respondents (19%) Who undertakes the Prolanis service at Public health centers. Statistical test results using the chi-square test obtained the value P = 0.002, due to the value of p < 0.05 then there is an education level relationship to the utilization of the Ministry of Prolanis patient in the lateri health center of Post Earthquake.

Based on the marital status indicates that of 53 respondents who are married, there are 43 respondents (81.1%) That utilize the Prolanis health services in the Lateri Public Health center well and 10 respondents (18.9%) Who is less utilizing the medical service in the Lateri Public Health Center while the 16 respondents who are not married or divorced/widowed there are 11 respondents (68.8%) Who utilize the Prolanis service in the Lateri Public health Center and 5 respondents (31.2%) Who undertakes the Prolanis service at Public health centers. Statistical test results using the chi-square test obtained the value P = 0.006, due to the value of p < 0.05 then there is a marital status relationship to the utilization of the service of the patient in the post-Earthquake Department center.

## Discussion

### Age relationship with the use of Prolanis patient service

Based on adult category age, there are 23 respondents (71.9%) That utilize the Prolanis health services in the Lateri Public Health center well and 9 respondents (28.1%) Who undertakes the use of medical services in the Lateri Public health center while from 37 respondents grouped by elderly there are 31 respondents (83.8%) Who utilize the Prolanis service in the Lateri Public health Center and 6 respondents (16.2%) Who undertakes the Prolanis service at the Public Health center of Post-earthquake. This research is not in line with Jenry et al, 2017 which indicates there is age relationship with the utilization of Public health Center service with value P = 0.004. [4] The research conducted by Kim & Hong (2018) stating that the age level does not affect the level of utilization of health care for the elderly with or without chronic illness [5]

### Gender relations with the use of Prolanis patient services

Gender can influence in decision making to conduct treatment search. [8] This is because women need special health services such as pregnancy health services and specific diseases that require women to utilize health care. Another study mentions that gender does not affect people to be able to use health care services. Both men and women have the same risk utilizing health services [6]. The results of the above studies show that Bivariate

was obtained from 69 respondents, consisting of 53 female respondents and 16 male respondents. According to the table above, it can be seen that the utilization of Prolanis in post Earthquake Community Health center is dominated by female gender. One of the factors that make the utilization rate of Prolanis dominated by female types. Statistical test results using chi-square indicate a value of P = 0.00 which means the gender relates significantly to the utilization of the prolanis patient in the Lateri public health centers of post-earthquake. The results of research research of Risman et al (2020) which shows that female gender is more utilizing the Ministry of Prolanis in health services UPT Unpad compared to male gender. [7]

**The establishment of a relationship with Prolanis patient service**

The status of education is closely related to the awareness and knowledge of one, so that the status of education has a significant influence on the utilization of healthcare services. Usually low-educated communities, lacking awareness and good knowledge of the benefits of healthcare services [8]

This research shows the educational variables related to the utilization of Prolanis services in the Public health center post-earthquake leteri with a value of P = 0.001 < 0.05. This is in line with the results of the research of Napirah which shows there is a relationship level of education with the utilization of health care in the working area of community health centers of East Coast Poso District of Poso Regency.[9]

**Marital Status relationship with the use of Prolanis patient service**

Marital Status can improve health for individuals with chronic diseases. [10-16]. The majority of Prolanis patient in the Lateri health center are married. A total of 53 Prolanis patient were married to utilize the Ministry of Prolanis. According to Riaz et All arital status is one of the factors that can control the patient's condition in his chronically-controlled disease management efforts. This research is in line with the Syafa'at et al, 2019 indicates there is a influence of marital status (P = 0,015) on the utilization of Prolanis in FKTP Depok [11]. Couples or families can be a figure that can help the disease management process. It is not in accordance with the research which et all (2018) that there is no relationship between the status of married than that is not P = 0738. 5

## Conclusion

The study concluded that there is no age relation to the utilization of Prolanis services in post-earthquake community health centres (P = 0,271) However, there are gender relations (0.000), education (P = 002), and marital status (P = 0,006). Therefore, the Lateri Public health center can play an active role and reach out to Prolanis patient who utilize the post-occurrence service of the earthquake so that it can maintain and improve the degree of health especially in people with chronic diseases such as hypotensions and diabetes mellitus.

**Sourve of Funding :** Self

**Conflict of Ineterst :** Nil

**Ethical Clearance :** Obtained from the University Ethical clearance committee

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# The Influence of Occupational Safety and Health on Job Satisfaction and Organizational Commitment of Hospital Nurses in Makassar City

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## Abstract

Occupational safety and health is a system used to prevent the possibility that will arise due to work accidents and prevention of the emergence of diseases caused by work relationships with employees in the environment. This study aims to analyze the effect of occupational safety and health on job satisfaction and organizational commitment of hospital nurses in the city of Makassar. This type of research is quantitative research using observational studies with cross sectional study design and using path analysis. Sampling using stratified random sampling so that the sample in this study were nurses in charge of Inpatient Installation, IGD, ICU and OK, amounting to 230 respondents. The results showed there was an effect of occupational safety and health variables on job satisfaction (p = 0.001), there was an effect of occupational safety and health on organizational commitment (p = 0.001), there was an effect of job satisfaction on organizational commitment (p = 0.001), and there was no the effect of occupational safety and health on organizational commitment through job satisfaction (coefficient = 0.419). It is recommended to the hospital management to encourage nurses to work in an innovative way and provide opportunities in making decisions that pose a risk to the welfare of employees by providing benefits, prioritizing comfort and safety of nurses' work in order to increase nurse job satisfaction so that it has an impact on improving the quality and performance of the hospital.

***Keywords:*** *Occupational Safety and Health, Job Satisfaction, Organizational Commitment*

## Introduction

Job satisfaction also has a direct influence towards organizational commitment Companies or organizations that fulfill the desires or desires of employees will increase their work productivity either through incentives, support, recognition and rewards that are assessed on the performance results.According to Mathis & Jackson[1] states that job satisfaction reflects one's feelings towards work, when someone is satisfied with their work then they will be more committed to the organization.

Research conducted by Sembe and Amos[2] entitled "The Effect of Selected Occupational Health and Safety Management Practices on job satisfaction of Employees at University Campuses in Nakuru Town, Kenya". His findings reveal that Occupational health and safety management practices lead to increased job satisfaction among employees. Ward[3] in his research entitled The impact of health and safety management on organizations and their staff, states that this study examines the impact of proactive OHS management on organizational performance, employee attitudes towards work and their organization, and employee health and welfare. At the organizational level, the proactive OSH approach is associated with more positive organizational attitudes and perceptions of the safety climate. At the level of individual employees, a more positive perception of safety and organizational attitude is associated with better health and well-being[4-6].

RSUP Dr. Tadjuddin Chalid, Makassar City Hospital and Stella Maris Hospital are class B general hospitals in Makassar City and have been accredited. Based on a preliminary study with unstructured interviews with informants, namely the Head of Occupational Safety and Health & infection prevention and control in December 2019 to January 2020, it was found that workplace

accidents that occurred in officers, especially nurses in 2017-2019, were punctured by used syringes in inpatient installations, emergency room , ICU and operating room. This happens because officers who do not comply with SOPs such as not wearing Personal Protective Equipment (PPE), and using repeated needles. In addition to conducting interviews with the head of Occupational Safety and Health, while conducting interviews with nurses some of them did not know Occupational Safety and Health so it cannot be known how the success of Occupational Safety and Health implementation.

## Materials and Method

### Design of Research and Location

This research was conducted at the Dr. Tadjuddin Chalid, Kota Makassar Hospital and Stella Maris Hospital. This type of research is quantitative research using observational studies with the Cross Sectional Study approach.

### Method of collecting data

The instrument used in data collection was a questionnaire, regarding the independent variables in the form of occupational safety and health while the dependent variable was the variable job satisfaction and organizational commitment.

### Data analysis

The data analysis technique of this study used univariate analysis, bivariate with Chi Square test, and multivariate analysis with path analysis with Statistical Package for the Social Sciences (SPSS) 22.0 for windows program.

## Results

### Univariate Analysis

**Table 1: Frequency Distribution of Respondents Based on Research Variables in RSUP Dr. Tadjuddin Chalid, Kota Makassar Hospital and Stella Maris Hospital**

| No. | Research variable | | RSUP Dr. Tajuddin Chalid | | RSUD Kota Makassar | | RS Stella Maris | |
|---|---|---|---|---|---|---|---|---|
| | | | n | % | n | % | n | % |
| | Occupational Health and Safety | | | | | | | |
| 1. | a. | High | 23 | 53,5 | 39 | 47 | 104 | 100 |
| | b. | Low | 20 | 46,5 | 44 | 53 | 0 | 0 |
| | Job Satisfaction | | | | | | | |
| 2. | a. | High | 11 | 25,6 | 13 | 15,7 | 98 | 94,2 |
| | b. | Low | 32 | 74,4 | 70 | 84,3 | 6 | 5,8 |
| | Organizational Commitment | | | | | | | |
| 3. | a. | High | 17 | 39,5 | 16 | 19,3 | 99 | 95,2 |
| | b. | Low | 26 | 60,5 | 67 | 80,7 | 5 | 4,8 |
| | Total | | 43 | 100 | 83 | 100 | 104 | 100 |

Primary Data Sources 2020

Amounting to 94.2% stated high for the variable job satisfaction and by 95.2% stated high for the variable organizational commitment.

***Bivariate Analysis***

Table 2 shows the relationship between the independent variable and the dependent variable. Based on the results of the analysis it can be seen the influence of occupational safety and health variables on job satisfaction in Dr. Tadjuddin Chalid, Kota Makassar Hospital and Stella Maris Hospital.

**Table 2: Comparison of Sig. in the Anova Table to Test the Effect of Occupational Safety and Health Variables on Job Satisfaction and Organizational Commitment Nurse General Hospital in Makassar City**

| No. | Variable | Sig Value. (Anova Table) | | |
|---|---|---|---|---|
| | | **RSUP Dr. Tadjuddin Chalid** | **RSUD Kota Makassar** | **RS Stella Maris** |
| 1. | Occupational Health and Safety | 0,001 | 0,001 | 0,001 |
| 2. | Job Satisfaction | 0,001 | 0,001 | 0,001 |
| 3. | Organizational Commitment | 0,001 | 0,001 | 0,001 |

Primary Data Sources 2020

There is an influence of occupational safety and health variables on organizational commitment Dr. Tadjuddin Chalid with p = 0.001 <0.05 and r = 0.762, Kota Makassar Hospital with p = 0.001 <0.05 and r = 0.735, Stella Maris Hospital with p = 0.001 <0.05 and r value = 0.801 and there is an effect of the variable job satisfaction on organizational commitment Dr. Tadjuddin Chalid with p = 0.001 <0.05 and r = 0.796, Kota Makassar Hospital with p = 0.001 <0.05 and r = 0.727, and Stella Maris Hospital with p = 0.001 <0.05 and value r = 0.944.

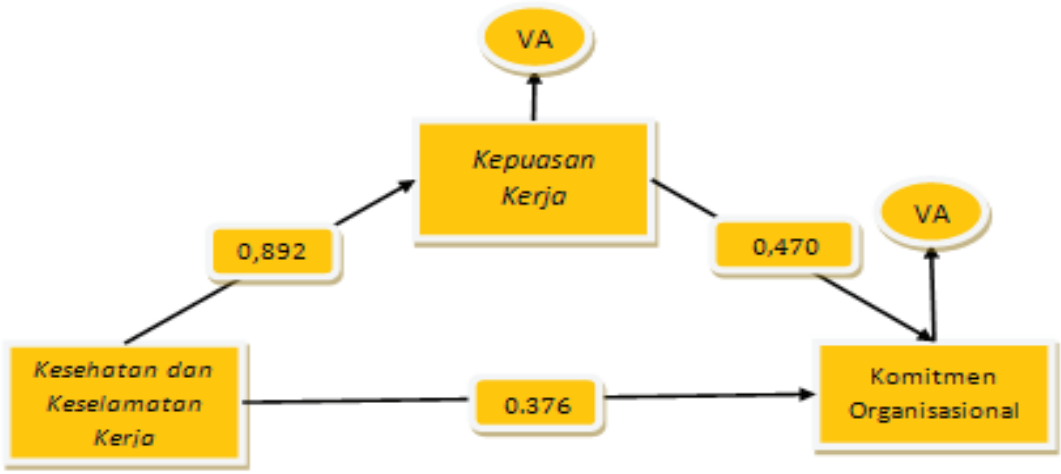
***Multivariate Analysis***

Table 3 explains how closely and indirectly the influence between variables, namely between occupational health and safety variables on organizational commitment variables through job satisfaction.

**Table 3: Results of Analysis of the Pathway between Occupational Health and Safety, Job Satisfaction, and Organizational Commitment of Nurses in General Hospitals in Makassar City**

| Variable | Coefficient | P Value | Explanation |
|---|---|---|---|
| Occupational Health and Safety à Job Satisfaction | 0,892 | 0,001 | Direct |
| Occupational Health and Safety à Organizational Commitment | 0,376 | 0,001 | Direct |
| Job Satisfaction à Organizational Commitment | 0,470 | 0,001 | Direct |
| Occupational Health and Safety à Job Satisfaction à Organizational Commitment | 0,419 | | Indirect |

Primary Data Sources 2020




**The path analysis is based on a path diagram between occupational health and safety to organizational commitment through job satisfaction shown in the figure below:**

The effect of job satisfaction on organizational commitment obtained p = 0.001 <0.05 with a large influence of 0.470 which means that if job satisfaction rises by 1 point, organizational commitment will increase by 0.470 points. Whereas there is no effect of occupational health and safety on organizational commitment without going through job satisfaction because the greater indirect path coefficient = 0.419 than the direct path coefficient between work health and safety on organizational commitment = 0.376.

## Discussion

Occupational safety and health is one of the most important things to consider in the company because this is something that must be guaranteed given to employees in supporting the success of their performance. Therefore, several dimensions that must be considered in the occupational safety and health of employees are Commitment management, Communication, Priority of safety, Safety rules and procedures, Supportive environment, Involvement, Personal priorities and needs for safety, Personal appreciation of risk and Physical work environment[3-6]

Regression test results of Hospitals in Makassar City show that the p-value (0.001), this means that the null hypothesis (Ho) is rejected, meaning that there is an influence between occupational safety and health with nurse job satisfaction. Both these variables have an effect strengthened by a statement according to Mangkunegara[7] which states that every employee to obtain a guarantee of occupational safety and health both physically, socially, psychologically can increase job satisfaction.

Occupational safety and health variables indicate that most hospital nurses stated that they disagreed with the statement given enough time to finish work safely (76.5%), the suggestions I gave related to Occupational safety and health would be considered (83%), the hospital gave protection of employees against physical and emotional losses (80.9%). Special attention to the safety and health of employees at the hospital is a natural thing, but in reality what happens in the field shows attention to occupational safety and health is relatively less comparable to the work risks faced.

This research is in line with what was done by Yusuf et al[8], namely K3 has a significant effect on job satisfaction. The coefficient of entry with a positive standard value of 0.351 indicates that as K3 increases, job satisfaction will also increase. Other research, namely research conducted by Sembe & Amos[3] states the findings reveal that safety and health management practices lead to increased job satisfaction among employees.

Regression test results for Hospitals in Makassar City show that the p-value (0.001) means that the null hypothesis (Ho) is rejected, meaning that there is an influence between occupational safety and health with

the organizational commitment of nurses. Because the significance value or p value of 0.001 <0.05, it means that statistically there is a significant influence between occupational safety and health with organizational commitment of nurses. Organizational members who have a higher level of commitment will be more enthusiastic and motivated to carry out their duties or work.

Research supported by the results above is a study conducted by Amponsah Tawiah and Justice[9]. These findings reveal a positive and significant relationship between the work of health and safety management, and affective, normative, and ongoing commitment. Occupational Safety and Health is important to guarantee employee commitment. The factors that influence nurses' commitment to aspects of OSH regulations are implemented well, OSH obligations and needs, work location conditions, employee perceptions and benefits provided by the hospital. Therefore, the hospital needs to be more active in paying attention to the factors that make employees' commitments at each work level different so that evaluation can be carried out in the future. The results of this study support the theory and previous studies that examine the effect of the application of OSH to organizational commitment namely[10,11].

Regression test results at Hospital in Makassar showed that the p-value (0.001) meant that the null hypothesis (Ho) was rejected, meaning that there was an influence between job satisfaction and organizational commitment of nurses. Because the significance value or p value of 0.001 <0.05, it means that statistically there is a significant influence between job satisfaction with organizational commitment of nurses. Employees who are satisfied with what is obtained from the company will provide more than what is expected by companies with high commitment and he will continue to try to improve performance.Job satisfaction variable shows that most hospital nurses expressed less agree on the statement I was satisfied with the promotion system set according to the length of service, performance and abilities performed in the hospital (90.9%), I was satisfied with the way the hospital apply a policy on sanctions in the promotion of office if violated (sanctions in the form of reprimand or summons) (86.5%), I feel satisfied because the leadership gave a complete answer to questions and complaints (83.5%). Other research, namely research conducted by Liao[12] states that satisfaction also has a positive influence on organizational commitment ($\beta = 0.33$, $p < 0.01$) on all significant models. The average value of job satisfaction and organizational commitment is on the moderate side. Significant positive relationships are being found among the aspects of job satisfaction, demographic factors, and organizational commitment. Supervision, salary, overall job satisfaction, age, and years of service are significant predictors of organizational commitment. The results show support for the first hypothesis because all aspects of job satisfaction are significantly related to organizational commitment at the 0.01 and 0.05 levels. These results are consistent with the results of research from Naderi[13] in the study conducted found a positive and significant relationship between job satisfaction with organizational commitment.

Based on the results of the analysis conducted using path analysis to see the direct effect and the indirect effect between variables, it was found that the indirect path coefficient between occupational safety and health on organizational commitment through job satisfaction is 0.419 and the direct path coefficient between work safety and health on job satisfaction which is 0.892. then the direct path coefficient is greater than the indirect path coefficient which is 0.892> 0.419 meaning indirectly occupational safety and health through job satisfaction does not have a direct influence on organizational commitment. Research conducted by Crow et al[14] and Eslami & Gharakhani[15] which shows that job satisfaction has a positive and significant influence on organizational commitment.

Based on the results of research at three public hospitals in Makassar City, it was found that Stella Maris Hospital is a hospital that has an occupational safety and health effect on job satisfaction and organizational commitment of nurses that is greater than Tadjuddin Chalid General Hospital and Makassar City Hospital. This is in accordance with the respondent's answer stating that the existing work facilities are adequate related to occupational safety and health, so that employees at work can create job satisfaction at Stella Maris Hospital, such as a safe and comfortable work environment, suitable work protection equipment , supporting temperature and lighting conditions and health insurance provided, so that employees at work feel satisfied and comfortable.

## Conclusions

Based on the results of the study, researchers formulated the following conclusions: There is an influence on occupational safety and health on job satisfaction and organizational commitment of nurses, job satisfaction affects organizational commitment and occupational safety and health does not affect the organizational commitment of nurses through nurse job satisfaction. Based on the research results and conclusions that have been formulated.

**Ethical Clearance**- Taken from University ethical committee

**Source of Funding**- Self

**Conflict of Interest**– Nil

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# Influence of Iur Cost to Patient Satisfaction through Customer Value patients BPJS Hospital in South Sulawesi Province

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## Abstract

Hospitals as a means of public health services are required to perform optimal service. This is because patient satisfaction is very dependent on the quality of hospital services. This research aims to determine the influence of Iur cost to the satisfaction of BPJS patients through customer value in the province of South Sulawesi Research conducted at Dr Sumantri, Hospital, Andi Makkasau hospital and Lasinrang hospital. The research method used is an analytical observational observation with a cross-sectional study approach. The population in this study is BPJS patients with Iur cost. The sample amount of 300 people is obtained by accidental sampling method. Data collection is obtained through interviews using questionnaires. Data is processed and analyzed using SPSS and AMOS. The results showed that the IUR cost significantly affected the customer value (p = 0.001), the customer value is significantly affected the patient satisfaction (p = 0.001) and the cost of the patient to significantly affect patients satisfaction (P = 0.001). Conclusion of this research is Iur cost can directly affect patient satisfaction and influence indirectly to patient satisfaction through customer value.

***Keywords:*** *BPJS, customer value, patient satisfaction*

## Introduction

Health is a very important need for people and is a major capital in conducting daily activities. To create a society that has a high degree of health, the implementation of development in the health sector is a priority.[1] Healthcare business becomes one of the media in supporting the health of people in the world. The establishment of various types of healthcare providers ranging from simple such as clinics or health centres to hospitals that have various health supporting facilities. The presence of various health facilities is expected to assist in providing maximum health services to the community.[2]

Public awareness of the importance of health today is increasing as a fundamental measure of life quality, along with the advancement of communication technology and information, socio-economic, cultural, which encourages the development of the role of the service sector. The Indonesian Government through the Ministry of Health since 1 January 2014 held health insurance for the community through the Social Security Administering Agency (BPJS) held health insurance. Thus the Government is obliged to provide quality healthcare services. Health care is a human right that must be fulfilled by the Government.

Public interest in the BPJS program is demonstrated by the magnitude of interest of the community as a participant of the BPJS program. Data in September 2014 number of participants BPJS Kesehatan in Indonesia as much as 127.3 million people (65%) and continues to increase, in November 2017 recorded 183,579,086 participants or approximately (70%) And in September 2018, the number of participants reached 201,660,548 people, as well as on 1 February 2019 reached 217,549,455 people. With a figure of 217 million, this means that the number of participants BPJS Kesehatan has reached 81.8% of the total population of Indonesia which is about 265 million, as data is quoted from the official website of BPJS. Following data participant BPJS Health South Sulawesi year 2019/2020. BPJS Kesehatan

Report Data of South Sulawesi in 2019, especially in 4 (four) Regency/city consisting of Barru District, Parepare, Pinrang and Sidenreng Rappang who are under the branch office of Parepare, noted that as many as 863,053 people in JKN, in January to July and there are 15% patients using IUR fee, for people without JKN as many as 183,587 people using IUR cost as much as 23%.[3]

Hospitals as a means of public health services are required to perform optimal service. It is as hospital accountability to be able to compete with other hospitals in terms of comprehensive and plenary patient services covering the promotive, preventive, curative and rehabilitative aspects as well as a referral centre for public health.[4] According to Law No. 44 the year 2009 about the hospital that article 29 clause (1) states that each hospital has the obligation to carry out social functions, among others, by providing inadequate/ poor patient service facilities, no upfront emergency services, free ambulance, disaster victims services and extraordinary events, or social service for humanitarian missions.[5]

Patient satisfaction will be fulfilled when the service provided is in accordance with their expectations.[6] Hawkins and Lonney in Tjiptono mention that the satisfaction attribute consists of the suitability of expectations, interest revisit, willingness to recommend.[7] The description elaborates that in essence, service users ' satisfaction is identical to the achievement of hope for the service they receive so that the user wishes service in this

If the expectation is fulfilled, it means that the service has given a remarkable quality and also will cause high satisfaction. Conversely, if the expectation is not achieved, then interpreted the quality of service does not fulfil what he hoped for.[8] hospitals should be able to improve the quality of service because of good quality, will be able to cause (customer value) or good judgment effect in the patient or satisfied, as the purpose of public service is to satisfy the community

The results of the initial survey conducted by researchers for the satisfaction of services held in the Lasinrang hospital and Andi Makassau hospital and Dr Sumantri hospital. There are some views or assessment of the patient's acceptable service is still lacking a good example is that there is no certainty or details of the standard such as the presence of participants in Class 3 BPJS who want to get 2nd-grade treatment must pay the cost of the difference between Class 2 and Grade 3. BPJS only pays class 3 while the difference between Class 3 to Class 2 is paid by the participants. Meanwhile, service in 2nd grade is not maximal.

## Materials and Method

This study included a quantitative research type of analytical descriptive methods with a cross-sectional approach. The research was held in the Lasinrang hospital, Andi Makkasau hospital and Dr Sumantri hospital. The population in this study is BPJS patients who use (IUR cost) or the difference in the cost of service they received in the year 2019. Samples are obtained using the purposive sampling method and obtained a total of 300 respondents. Data collection is conducted through interviews using questionnaires. Data collected is a characteristic of respondents, BPJS membership classes and treatment classes used, customer value, perception of IUR the cost of patients BPJS and patient satisfaction. Data analysis is done in multivariate using the path analysis with the help of AMOS software.

## Results

Based on the results of the study then obtained the results as that based on the category of patient satisfaction level in the Andi Makkasau Hospital known that the number of respondents is satisfied as much as 13 people (13%). The respondent who was satisfied amounted to 48 people (48.0%) while being very satisfied amounting to 39 people (39.0%). In the Lasinrang hospital, the number of dissatisfied respondents amounted to 1 person (1%), a respondent who is quite satisfied as much as 12 people (12%). The respondent who was satisfied amounted to 53 people (53.0%) while being very satisfied amounting to 34 people (34%). Meanwhile, at Dr Sumantri Parepare hospital, the number of unsatisfied respondents amounted to 1 person (1%), the respondent who is quite satisfied as much as 12 people (12%). The respondent who was satisfied amounted to 46 people (46.0%) while being very satisfied amounting to 41 people (41.0%) (Table 1)

**Table 1 Respondents Distribution Based on Patient Satisfaction Rate**

| Hospital | Patients Satisfaction | Amount | |
|---|---|---|---|
| | | n | % |
| Andi Makkasau | Quite satisfied | 13 | 13.0 |
| | Satisfied | 48 | 48.0 |
| | Very satisfied | 39 | 39.0 |
| Lasinrang | Unsatisfied | 1 | 1.0 |
| | Quite satisfied | 12 | 12.0 |
| | Satisfied | 53 | 53.0 |
| | Very satisfied | 34 | 34.0 |
| Dr. Sumantri | Unsatisfied | 1 | 1.0 |
| | Quite satisfied | 12 | 12.0 |
| | Satisfied | 46 | 46.0 |
| | Very satisfied | 41 | 41.0 |
| | Total | 100 | 100 |

Based on the category of customer value, the result that in the Andi Makkasau hospital The number of respondents in the category is quite good that is as much as 4 people (4.0%). Respondents who were in a good category amounted to 67 people (67.0%), while an excellent number of 29 people (29.0%). In the Lasinrang hospital the number of respondents who were in the category of not good 1 person (1.0%), good enough to be as many as 7 people (7.0%). Respondents who were in a good category amounted to 56 people (56.0%), while an excellent number of 36 people (36.0%). While at Dr Sumantri hospital. The number of respondents who are in the category of not good amounted to 1 person (1.0%), good enough that is as much as 7 people (7.0%). Respondents who were in a good category amounted to 54 people (54.0%), while an excellent number of 38 people (38.0%). (Table 2)

**Table 2 Respondents distribution based on Customer Value**

| Hospital | Customer Value | Amount | |
|---|---|---|---|
| | | n | |
| Andi Makkasau | Good enough | 4 | 4.0 |
| | Good | 67 | 67.0 |
| | Excellent | 29 | 29.0 |

***Cont...*** **Table 2 Respondents distribution based on Customer Value**

| | | | |
|---|---|---|---|
| Lasinrang | Not good | 1 | 1.0 |
| | Good enough | 7 | 7.0 |
| | Good | 56 | 56.0 |
| | Excellent | 36 | 36.0 |
| Dr. Sumantri | Not good | 1 | 1.0 |
| | Good enough | 7 | 7.0 |
| | Good | 54 | 54.0 |
| | Excellent | 38 | 38.0 |
| | Total | 100 | 100 |

In the category, IUR cost obtained the result that in the Andi Makkasau hospital number of respondents who are in the category of not good 1 person (1.0%), good enough that is as much as 31 people (31.0%). Respondents who were in a good category amounted to 46 people (46.0%), while an excellent number of 22 people (22.0%). In the Lasinrang hospital the number of respondents who were in the category of Not good 3 persons (3.0%), good enough that is as much as 20 people (20.0%). Respondents who were in a good category amounted to 49 people (49.0%), while those in a very good category amounted to 28 people (28.0%). While at Dr Sumantri hospital the number of respondents who are in the category is not good 3 people (3.0%), good enough that is as much as 16 people (16.0%). Respondents who were in good category amounted to 52 people (52.0%), while a very good number of 29 people (29.0%) (Table 3).

**Tabel 3 Respondents distribution based on Iur Cost**

| **Hospital** | **Iur Cost** | **Amount** | |
|---|---|---|---|
| | | **n** | **%** |
| Andi Makkasau | Not good | 1 | 1.0 |
| | Good enough | 31 | 31.0 |
| | Good | 46 | 46.0 |
| | Excellent | 22 | 22.0 |
| Lasinrang | Not good | 3 | 3.0 |
| | Good enough | 20 | 20.0 |
| | Good | 49 | 49.0 |
| | Excellent | 28 | 28.0 |
| Dr. Sumantri | Not good | 3 | 3.0 |
| | Good enough | 16 | 16.0 |
| | Good | 52 | 52.0 |
| | Excellent | 29 | 29.0 |
| | Total | 100 | 100 |

Analysis of the results using the line analysis with the application AMOS then obtained 0.51 0.87 the results that IUR cost (convenience of service, Security Service and service assurance) directly affect patient satisfaction (suitability expectations, interest revisit, and willingness to inform) with a coefficient of beta 0.43 and affect indirectly through Customer Value (services, quality, cost, social, information and experience) with a The relationship between variables obtained results that the IUR variable cost in conjunction with the Customer Value variable p = 0.001 (significant). The Customer Value variable in conjunction with the patient satisfaction variables generated value P = 0.001 (significant) and IUR variable cost in conjunction with the patient satisfaction also generated value P = 0.001 (significant). As for the relationship between variables can be seen in the image below:

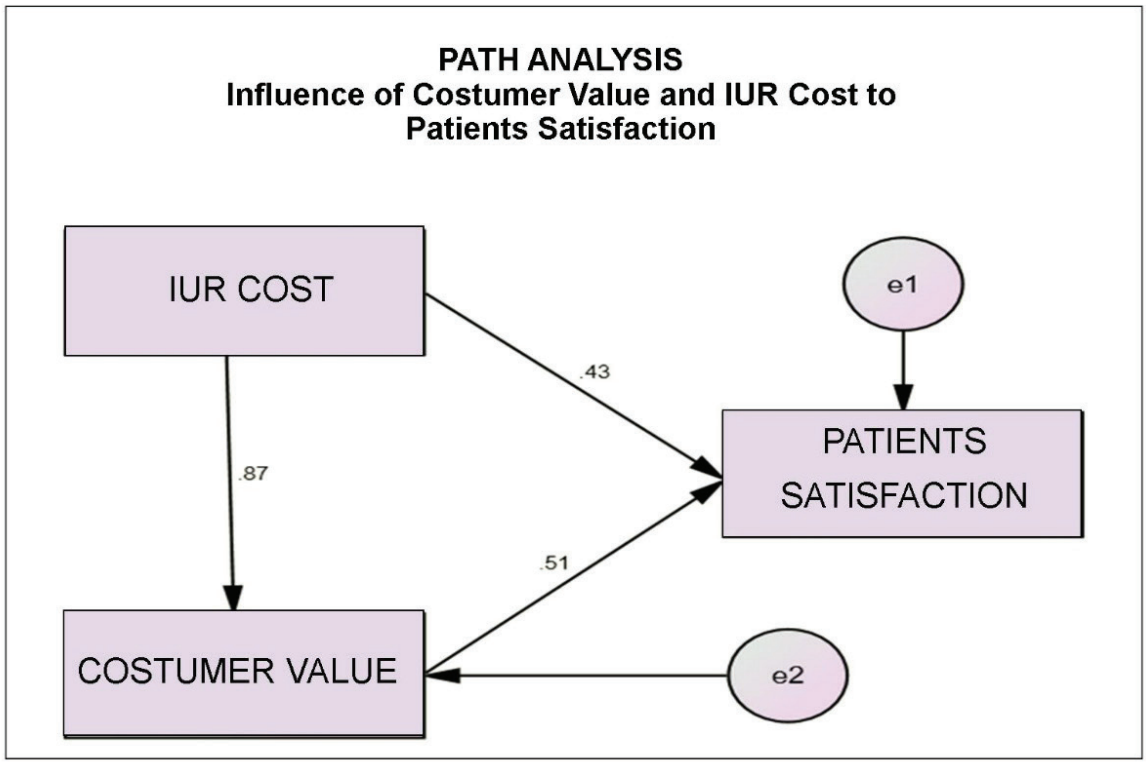


**Figure 1. Customer Value and Iur cost analysis influence on patient satisfaction**

## Discussion

IUR cost is an additional fee paid by the participants of BPJS at the time of obtaining a higher health service benefit of its rights. The rights owned herein are the rights of patients based on their participation. The analysis of the pathway using AMOS shows that in addition to directly affect the IUR costs also influence indirectly to patient satisfaction through Customer Value (services, quality, cost, social, information, experience) with beta coefficient 0.87 and 0.51.

Based on the coefficient, it can be calculated that the indirect effect of the IUR cost is 0.87 x 0.51 = 0.44. It can be interpreted that the indirect influence of IUR costs to the patient's satisfaction of 44%. Based on these results it can be seen that the indirect influence of IUR costs greater than the direct influence of 43%. This positive figure indicates that IUR costs significantly and positively affect patient satisfaction. So the better assessment of IUR cost will boost the increase in customer value or customer value. Better Customer Value will drive the increasing level of patient satisfaction.

Allahham also states that some marketing-related literature states that there is a positive relationship between satisfaction to the cost of the value perceived by the customer. Hospitals that provide customers with a higher value are likely to be able to satisfy them, it can improve patient loyalty. This is in line with the results of the model on research where the influence of iur cost to satisfaction through customer value. So that it can be interpreted that the IUR costs obtained by the patient can affect the customer value or the judgment of the services obtained. The patient's assessment of the service affects the level of contentment he felt.[9]

Satisfaction as a comparison between expectations or expectations of the patient will quality with the quality of service obtained. So the patient's expectation or expectation and quality of service are perceived as a major factor affecting patient satisfaction. But in addition to these two factors, the cost factor incurred today has also been regarded as a major factor in patient satisfaction.[10] in general, patient loyalty and return interest are influenced by the level of satisfaction of the service they received earlier. Therefore, it is very important to understand the factors that affect patient satisfaction based on the service paradigm.

Indonesian Ministry of Health states that the hospital tariff is a reward received by the hospital for services from services and non-service activities provided to the service users. Service users, in this case, our patients. So it can be interpreted that the hospital tariff is a reward received by the hospital for the service provided to the patient.[11] hospitals also need to think about the tariff of its services so that the tariff is appropriate or appropriate in the eyes of consumers. Tariffs that are inappropriate or too expensive will instead make the consumer dissatisfied, complained and eventually moved to another health service.[12] Tariff is part or all of the cost of organizing activities of medical and non-medical services that are charged to the public in exchange for services received.

Tjiptono states that the value can be defined as the ratio between perceived benefits to the price. If the perceived value of the customer is high, it will create maximum satisfaction. This is in line with the research results where the cost is a factor that affects the customer value or customer's assessment of the service provided by the hospital. The value of this patient then affects the feeling of contentment in the patient.[13-15] Customer value) has become an ongoing concern in building and supporting the benefits of competition and creating customer relationship management. The value of a customer related to the use of a or more is something customers feel. Customer value is a strategic weapon in attracting and holding customers. Customer value has become one of the most important factors in the success of a service provider including hospitals.

## Conclusions and Suggestions

The research concluded that IUR costs directly affect patient satisfaction with the beta coefficient of 0.43 and indirectly affect the Customer Value with the beta coefficient 0.87 and 0.51. The IUR variable cost significantly affects customer value. Customer value variables relate significantly to patient satisfaction and the IUR variable costs significantly affect patient satisfaction. The advice that can be given is that the hospital needs to improve the quality of its ministry in order to increase patient satisfaction to the services provided.

**Ethical Clearance-** Taken from University ethical committee

**Source of Funding**- Self

**Conflict of Interest**– Nil

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# Health Education Influence the Maybrat's Women Early Cancer Cervical Detection

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## Abstract

Until now, cervical cancer is still as the leading cause of the death of women worldwide. WHO was estimates that cancer cases will rises sharply until 2030. Although the cervical cancer data of West Papua is the lowest 0.1% in Indonesia, especially in Sorong Raya region certainly wasn't have the real data, but the iceberg phenomenon is still continues to occur. The study aim was to determine the effect of health education toward the early detection action of cervical cancer by the Maybrat's Women. The research method used was quasi-experimental with one group pretest posttest approach using non-probability puposive sampling technique. From the 30 participants were recruited based on inclusion criteria through the paired t test defined that there was an influence of health education toward early cervical cancer prevention action by Maybrat's Women at Maybrat ($p=0.011$, $\alpha<0.05$). Health promotion of cervical cancer in Maybrat Regency should be strengthen by the adequately funding encouragrment.

***Keywords****: health education, early detection, cervical cancer.*

## Introduction

World Health Organization (WHO) estimates that cancer deaths were 7 million people worldwide, people suffering from cancer were 25 million, but it will increase sharply by the 2030. meanwhile in Indonesia alone, cervical cancer was the first killer, every 30 minutes 1 person dies and every 15 minutes there was 1 new case[1]. Those means that, people who died from cancer increased by 200% and those living with cancer by 300%[2]. The Indonesian Ministry of Health (2014) also reported that cervical cancer was the highest case in all hospitals were 12.8%. Even more worrying is that the data shows is only an iceberg phenomenon, where only very few cases have been detected in hospitals compared to communities that have not[3].

Even so, it turns out the Riskesdas rerearch results showed that the prevalence of cervical cancer in the provinces of Gorontalo and West Papua was the lowest at 0.2% (508 cases) and 0.1% (222 cases) when compared to other 31 provinces, even in Papua province 1.1% (3,642 cases)[2]. Likewise with the Sorong Raya region in general, there were no definitive data on cervical cancer cases. Data from the Sorong District General Hospital shows a referral hospital from other districts in the vicinity, the number of cervical cancer patients who has come for the treatment purpose since 2013-2015 were estimated to be only 1-3 cases and there were no new cases. Based on the National Health Indicator Survey (Sirkesnas) (on May 2016), data obtained from the Maybrat District Health Office in 2014-2015, there were an increases in the number of Fertile Women (WUS) ages 15-49 years from 11,428 to 13,600 people (total population of 45,170 people)[4]. However, from the results of a survey of the actions of Maybrat Women in preventing cervical cancer, no Maybrat Woman was found who had made early detection of cervical cancer.

This has actually become a concern, considering that one of the risky behaviors (sexual transmitted disease) which is a medium of transmission of high risk of human papillomavirus (high risk HPV) that causes cervical cancer[3,5] tends to be high in the West Papua region especially Maybrat. In addition, if it is seen that those ages of women at risk of cervical cancer ranges from 20-50 which is a productive age in terms of reproductive, economic and social social physiological functions will be disrupted.

One of the factors causing the detection of cervical

cancer cases is the lack of knowledge of women about the dangers of cervical cancer that have an impact on the low awareness and actions of Maybrat women to take early detection of cervical cancer[3]. A good knowledge of women about cervical cancer would encourage their actions to take prevent as early as possible[6]. Early recognition of cervical cancer is important because it can reduce new cases with prevention efforts more easily done if the risk factors and symptoms of cancer were identified[7].

## Material and Method

Research method used is quasi experiment with one group pre-postest test only design. Purposive sampling technique used to recruit the respondent. The data analysed with t test[8,9].

## Results

The following data of table 1 below is an univariate analysis result of the 30s respondents characteristics of the Maybrat's women.

**Table 1. frecuency distributions based on the respondent characteristis.**

| The Characteristics | Frequency | % |
|---|---|---|
| Formal Educations | | |
| - none | 3 | 10 |
| - Elementery School | 2 | 6.7 |
| - Yunior School | 7 | 23.3 |
| - Senior high School | 14 | 46.7 |
| - College | 4 | 13.3 |
| Marital Status | | |
| - none | 9 | 30 |
| - Civil Marital | 13 | 43.3 |
| - Cultural Marital | 6 | 20 |
| - Life divorce | 1 | 3.3 |
| - An affair | 1 | 3.3 |
| Number of Couples | | |
| - One | 18 | 60 |
| - More then one | 2 | 6.7 |
| - None | 10 | 33.3 |
| An Occupational | | |
| - Civil duty | 1 | 3.3 |
| - Private | 2 | 6.7 |
| - Parmer | 2 | 6.7 |
| - Vendor | 3 | 10 |
| - House wife | 9 | 30.3 |
| - None | 13 | 43.3 |
| Income (IDR) | | |
| - Less than 1 million | 13 | 43.3 |
| - 1-3 million | 6 | 20 |
| - 3-5 million | 1 | 3.3 |
| - None | 10 | 33.3 |

Notes: From the table 1. Shown that the bigests proportions are senior high school (46.7%), civil marital status (43.3%), lifes couple 1 (60%), non occupation (43.3%) and income less than 1 million (43.3%) and the smallests are elementery school (6.7%), life divorce status and and anaffair (each of these are 1%), the number of life couple are more than 1 (6.7%), work as civil duty (3.3%) and earning 3-5 million (3.3%).

The table 2 follows describe the distribution of mean values and standard deviations and minimum and maximum values based on age of the Maybrat's Women.

**Table 2. The distribution based on ages**

| Variable | Mean | SD | Min-Max | 95% CI |
|---|---|---|---|---|
| Ages | 28.43 | 9.33 | 12-44 | 24.95-31.92 |

Note: The result analysis shown that the Maybrat's women ages mean values are 28,43 (CI: 24,95-31,92), with the SD 9,33. Youngest and oldest are 12 and 44. From the interval results could be concluded that 95% which means it is believed that the average ages of a Maybrat's women are between 24.95 to 31.92 years.

Hypothesis test results with paired t test in table 3 below to test the significance of the mean value, standard deviation, standard error and probability values before and after health education intervention.

**Table 3. The mean distribution values of cervical cancer early detection preventian.**

| Prevention Knowledge | Mean | SD | SE | p value | n |
|---|---|---|---|---|---|
| Before | 64.83 | 11.706 | 2.137 | 0.011 | 30 |
| After | 70.83 | 10.992 | 2.007 | | |

Notes: the knowledge mean average after intervention is 70,83 with the SD 10,992. It shown that the mean value differentiation is 10 with the SD -1,643. The paired t test results shows that the p value equal 0,011, means there is an effect of health education toward the cervixal cancer early detection action of Maybrat Women.

## Discussions

The scope of respondent conducted is carried out at the working area of Ayamaru Public Health Center of Maybrat Regency with a purposive sampling technique, the sample that took in accordance with the research objectives and inclusion criteria.

The study results shows that there was a significant influence between health education on knowledge of preventive measures for early detection of cervical cancer, which indicated that health education through health promotion efforts is important to increase self-awareness of Maybrat's women's self-awareness about the dangers of cervical cancer so that they would motivated to take early cancer detection measures trough the Cervix screenings are both by IVA method and/or pap smear.

Although the May 2016 Sirkesnas data conducted in the Kocuas village showed that Maybrat women in the village had not been exposed to knowledge of preventing early cervical cancer detection, but data from the Kambuaya public health services center revealed by health NGO practitioners Dr. Sraun shows that health promotion and early detection of cervical cancer IVA method and breast cancer were always carried out in other Maybrat regions with ± 63 Maybrat women have been netted undergoing cervical cancer early detection tests in 2015-2016 as follows: Mare village 40 people, Away village 5 people (found 2 suspects), Kamrou Aitinyo village 5 people, Aifat 4 village, Temel village (Ayamaru Jaya) 5 people and Mapura village 4 people (November 2016). Meanwhile, for the East and West Aifat regions (including the Kocuas & Kocuwer villages) there are no Maybrat women who have been netted for early cervical cancer detection. One of the factors that caused it is the "stigma" that is still inherent in the community and husbands who reject their wives which causes people to still be ashamed and avoid not checking their cervical cancer status. This is in line with research by Marván, Ehrenzweig & Catillo-López about knowledge about cervical cancer prevention and psychosocial barriers to cervical cancer testing in 384 Mexican women found that although the majority of Mexican women (80%) had received pap smear information in 3 in the last year, however, only 29% had performed pap smears according to the Noma of Mexico

which indicates inadequate knowledge of Mexican women about risk factors for cervical cancer specifically for women with low education, disrespect for citizens and opinion that pap is an embarrassing examination so that their husbands does not allow his wive to follow the pap examinations[10-12].

This is certainly a serious concern to the local government, specifically related agencies, namely the health department to be able to promote health promotion programs and monitor the performance of 14 public health centers in the Maybrat district government area.

## Conclusion

There is an effect of health education toward the cervical cancer prevention action by the Maybrat's Women at Maybrat Regency.

**Disclaimer Statement**

**Acknowledgment** The authors acknowledge Head of the Ayamaru's Public Health Service Center who has facilitated this research.

**Funding Source** This research was funded by the Sorong Health Polytechnic institution.

**Conflicts of Interest** No conflict of interest were complained by those who involved in this research.

**Ethical Clearence** It has been allready approved by the Sorong Health Polytechnic ethical clearence committee.

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# Snowball Education Method Effect the Family Support for Plwha Art's Adherence

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**Absract**

HIV/AIDS epidemic nowadays has become as global effects, even if the prevention efforts still goes to conducted and improved. The aim of research was to knowing the effect of snowball method toward family support role in PLWHA ARV adherence. The research method used is quasy experiment with pre-posttest one group only design with the purposive sampling technique. Research results showed from 20 respondents were found at Malawei Public Health Center of Sorong City was that there are differentiation of mean values between pre-postest are 8,09 and standard deviation values are -0,49 and the Wilcoxon statistical test results was that the p values equal to 0,000 which mean there is a significant effect of the snowball method toward family support role in PLWHA ART's adherence. The snowball as the teaching method technique could be implemented in order to HIV/AID knowlege update and improves the PLWHA ART's adherence.

***Keywords:*** *snowball method, family support, PLWHA.*

## Introduction

Human Immunodeficiency Virus (HIV) /Acquired Immunodeficiency Syndrome (AIDS) now has become as a global impact. The World Health Organization (WHO) noted that since AIDS was discovered until 2015, there were 1.1 million people died, 2.1 million people were infected with HIV and 36.7 million people were living with HIV[1].

Indonesia is the Asian country with the fastest developing HIV epidemic. Until the end of 2009, it was estimated that there were 186,257 PLWHA (15-49 years) spread across 33 provinces in Indonesia[3]. Data from the Sorong City Health Office 2016 shows that 1,519 cases were identified as reactive (HIV+) with 459 cases undergoing ART and 80 cases failing to follow up[6]. Data from the Sorong City Malawei Health Center from January to December 2017 recorded 42 active people taking ARVs and 13 people stopping treatment[7].

The snowball method is a modification of the educational technique by asking to focus on the ability to make questions that are packaged in an interesting game such as throwing paper that is rolled round like a snowball containing questions to fellow friends. This method explains how knowledge is generated, starting with a thought that gathers new perspectives and through the growth of richer collective knowledge[9,10].

Family support can be a factor in determining individual health beliefs and values and determining the treatment program they will receive, providing support and making decisions regarding care of sick family members, especially PLHA who are isolated from the assistance of others related to adherence[12].

## Method

The research method used is Quasi Experiment *with non-equivalent control group* design using *pre-posttest one group only sampling technique* using Wilcoxon hypothesis test.

## Results

**Table 1. The Frequency Distributions of Respondent Characteristics based on demographic data.**

| Characteristics | Frequencies | Percentage |
|---|---|---|
| Ages: | | |
| - Teenager | 2 | 10 |
| - Early adulthood | 7 | 35 |
| - Late adulthood | 9 | 45 |
| - Elderly | 2 | 10 |
| Sex: | | |
| - Male | 10 | 50 |
| - Female | 10 | 50 |
| Formal Education Status: | | |
| - None | 1 | 5 |
| - Low Formal Education | 4 | 20 |
| - Midlle Formal Education | 14 | 70 |
| - High Formal Education | 1 | 5 |
| Tribe: | | |
| - Papua | 7 | 35 |
| - Moluccas | 9 | 45 |
| - Java | 2 | 10 |
| - Sulawesi | 2 | 10 |
| Occupation: | | |
| - None | 11 | 55 |
| - Civil duty/an army/police | 0 | 0 |
| - Work for company | 7 | 35 |
| - Private | 2 | 10 |
| Long HIVs Diagnosed: | | |
| - < 1 years | 2 | 10 |
| - 1 – 6 years | 16 | 80 |
| - > 6 years | 2 | 10 |

**Table Explanation:**

Table 1 shows that the highests respondents distributions are the late adulthood (45%), midlle formal education (70%), Moluccas tribe (45%), none occupation (55%) and has 1–6 years HIV diagnosed (80%) and the lowests are teeneger and elderly (10%vs10%), none formal education and highest formal education (10% vs 10%), both Java and Sulawesi tribes (10%vs10%), civil duty/an army/police (0%) and <1 years and >6 years HIV diagnosed (10% vs 10%). However, there is no any proportion differenttation between male and famale (50% vs 50%).

**Table 2. The Wilcoxon hyphotesis test of Snowball Method.**

| Family Support role | Mean | SD | SE | p value | N |
|---|---|---|---|---|---|
| - Before | 13,65 | 4,73 | 0,51 | 0,00 | 20 |
| - After | 21,74 | 3,24 | 0,51 | | |

Table Explanation:

From the tabel 2 as we see that the mean value before intervention is 13,65 with the SD 4,73 and after intervention is 21,74 with the SD 3,24. The before dan after mean values differentiations are 8,09 dan the SD are -1,49. the *Wilcoxon* test result is equal 0,000, which is mean there is a significant effect of the snowball education method toward the family support role.

## Discussions

The support role of family members remains as an important central part of the initial bastion for PLWHA. The phenomenon of discrimination and stigmatization turns out to be possible for people closest to PLWHA, even by health professionals in various health service units. Coupled with the problem of the still weak coordination of program implementation in various sectors, especially related to the rights of PLHA who have not been proportionately integrated[6]. This will affect PLHA to become depressed, thus triggering a decline in the PLWHA's health status and if it not treated quickly and appropriately could be fatal.

Despite its central role, many PLHA families refused to join in this study for various complex reasons. Some of the reasons that are often expressed are still feeling shy and have not dared to be open up to public. Researchers assume this is due to the high stigmatization both internally from within themselves, as well as externally originating from other families and communities and the assumption that HIV infection is caused by sexual anormative behavior. It turns out also, from the interviews of researchers with case managers of health services center and the hospitals, it is still found that PLHA and their families themselves do not want to open his/her HIV status to their closest people such as husbands, wifes, parents and other closest family members. This will certainly have an impact on the difficulty of reaching health services and the severed role of the family members in order to maintaining the health status of PLWHA.

The study results indicate that there is a significant effect on the application of the snowball method to increase knowledge of the role of family support in PLWHA's adherence. this means that family education and PLWHA can be applied using snowball method. With this technique, an audience that initially only discusses a particular topic in a small group, for example in this study the topic of discussion about PLWHA's ARV adherence, is gathered into a larger group to interactively discuss the same topic to equalize perceptions among discussion groups after being directed by the guider. The knowledge of ODHA families will be further enriched and deepened, rather than the using the classical educational method which is only done in one direction and ends with questions/ discussion without optimal audience involvement.

The similar research results are in line from Siboro (2013), about the effect of family support on the social functioning of PLWHA in Caritas PSE Medan shelter

using analytic observation methods based on statistical tests calculating Spearmen rank correlation coefficient (r'= 0.67) on 50 respondents showing the existence of the effect of family support on the social functioning of people with PLWHA[6]. Another research of Li, et al. (2004) also showed that PLWHA desperately need help and family support because the condition of chronic diseases experienced requires comprehensive treatment[7]. Family support have a positive impact on improving the PLWHA's quality of life[7]. The existence of a family member who is chronically ill will certainly cause tension and hopelessness that lasts long and is very influential on the condition of family member who suffer from illness[7].

From the literature search results, researchers did not found an identical study related to the effect of the snowball education method on increasing knowledge of the role of family support in PLWHA adherence. However, in practice the snowball method has been widely adopted and applied by teachers and lecturers in learning classes for a variety of purposes, particularly in evaluating student activity and for developing ideas on the main ideas of the topic[9,10]. The snowball method can be applied by forming small groups of 4-6 members per group. Formed circle formations in the group to make it look easier in the interaction look natural. The resource person designs the same theme given to each groups. Then each group member are given a paper to write their first thoughts about the theme set on a paper. Thoughts must be expressed in a few sentences but must remain clear enough, so that other members can also understand what the group members mean when writing it. When everyone has written down their ideas about the topic given, each member gives his/her paper to the group members on their right side, then the member who receives the paper rewrites his/her opinion on the same topic. The opinions could be contain various things, for example challenges and/or questions that respond to the opinions of the group members beforehand. Thought ideas written by group members then aim to develop existing thought ideas. After the second group member finishes writing their opinions, the paper is given again to the group members to the right, and so on. This cycle continues until the first member writer gets back the paper. Example: for identifying the mapping of group members' understanding, the exercise were given by the questions as follows: what do you think and understand about ART's adherence?; how should the solution be sought for PLWHA who have ART's dropped out?; what are your arguments about your friend's opinion about ART's droop out? Etc[8,9,10].

It is clear that the role of family support for PLWHA cannot be doubted, if the method of educating related topics is transferred through the snowball education approach in peer group visits every month and or involving PLWHA families in certain gathering forums. If we look at the characteristics of PLWHA, most of those were Papuans and Moluccas ethnic, we need to specify the health education approach who touches on the cultural sphere so that more informative related to HIV/AIDS can be internalized effectively and efficiently without any patronizing elements that are more autocratic. The snowball education method were more flexible in its application in small and large groups, so that it can trigger the exploration of knowledge and understanding of PLWHA in peer groups. So, it will be very conducive to increase the knowledge of PLWHA families, even PLWHA themselves will have a very positive impact on improving PLWHA's quality of life.

PLWHA with supportive support have an opportunity to improve their quality of life. Family support are one of the factors affecting the quality of life of PLHWA[13]. Family support has been become as a factor that could be influence the determination of individual health beliefs and values and determine the treatment program that received by PLHWA. The family provides support and makes decisions regarding the care of sick family members as well[13-16].

## Conclusion

There is an effect of the snowball education method toward the family supports role for PLWHA ART's adherence at the Malawei public health center of Sorong City.

### Recomendation

Familiy can further encourage PLWHA to participate in peer support groups in order to update their knowledge and improve family relationships which incidentally is very important in building the confidence of PLWHA. Family member of PLWHA can also initiate a PLWHA family forum adapted to the situation and condition of

family member to strengthen support for PLWHA to maintain ART compliance and quality of life pattern with the support of authorized health workers.

**Disclaimer Statement**

**Acknowledgment** The authors acknowledge the head of Sorong City public health center for the research approval and to the research participants who have been involved.

**Funding** This research was supported by the government fund through the Sorong Health Polytechnic institution.

**Conflicts of Interest** No conflict of interest were complained by those who involved in this research.

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# Analysis the Influence of Job Embeddednes and Work Engagement on Improving Employee Performance in Rsud Haji of South Sulawesi Province in 2020

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## Abstract

Performance is the result of quality and quantity of work achieved by employees in carrying out their duties in accordance with the responsibilities given to them. The role of reliable and professional employees is very helpful in improving organizational performance. The quality of employees who are still far from adequate will certainly affect the achievements. This study aims to analyze the Influence of Job Embeddednes and Work Engagement on Improving Employee Performance in RSUD Haji of South Sulawesi Province in 2020. The type of research conducted is quantitative research using observational studies with cross sectional study design. The sample in this study were employees who worked at RSUD Haji with 240 respondents. The results showed there was an influence of job embeddedness on employee performance (p = 0,000), there was an influence of job embeddedness on work engagement (p = 0,000), there was an influence of work engagement on performance (p = 0,000), and there was no influence of job embeddedness on employee performance through work engagement (coefficient = 0.146). It is recommended to the hospital management to increase the embeddedness and engagement of employees, where employees can feel the compatibility of the work and improve the formal or informal relationship between an employee and the hospital environment so that the impact on improving the quality and performance of the hospital.

***Keywords:*** *Job Embeddedness, Work Engagement, Employees Performance*

## Introduction

The success of an organization in carrying out its activities is determined by human resources as the executor of the activity. The success of a public organization is determined by human resources. Research from Rivai & Basri[1] has shown that a pleasant work environment is very important to encourage the most productive levels of employee performance. In daily interactions, between superiors and subordinates, various series of assumptions and other expectations arise.

*Job embeddedness* is a picture of an employee who feels attached to his work or employees with high embeddedness will feel they have a compatibility and comfort with their work and will feel a lot of sacrifice if the employee leaves the job. Mitchell et al[2] develop a concept known as job embeddedness, which explains the reasons that make an individual survive in an organization.

*Work engagement* is the latest issue in the management of Human Resources (HR). Work engagement is defined as a positive, satisfying mental condition associated with work characterized by vigor, dedication, and absorption[3]

Bakker et al[4,5] states that employees who have a higher work engagement, will tend to be more creative, more productive and willing to work extra. Referring to some research results, it can be concluded that work engagement is an important aspect for every employee in completing their work that is believed to be able to improve.

RSUD Haji of South Sulawesi Province is a Class B general hospital in Makassar and has been accredited.

Based on preliminary studies conducted by BOR, it decreased from 2014 to 2018. BOR in RSUD Haji in 2014 and 2015 reached 60%, but decreased in 2016 with achievements of 51.57%, in 2017 it reached 55.67% and in in 2018 decreased by 50.57%. Even though the standard value or ideal figure that should be achieved is 60-85%.

Based on the findings in RSUD Haji, warning letters that have been issued in 2017 were 20 warning letters. In 2018 there were 22 warning letters issued by the hospital and in 2019 there were 11 warning letters issued by the hospital. Violations that are often done by employees are late and absent from work. Based on the findings of the number of absences without employee information in 2019 experiencing fluctuations and the most absenteeism in June 2019 that is as many as 454 days. Whereas based on unstructured interviews with patients, patients stated that the services provided to patients who received treatment were still low.

Based on this phenomenon, it can be seen that employee performance control in RSUD Haji is not implemented as well as possible as well as in carrying out the tasks not implemented as well as possible. Mistakes that often occur and happen again due to lack of supervision and evaluation so that the impact on service delivery is less than optimal. The purpose of this study was to analyze the influence of job embeddednes and work engagement on improving employee performance in RSUD Haji of South Sulawesi Province in 2020.

## Materials and Method

### Design of Research and Location

This research was conducted at RSUD Haji South Sulawesi Province. This type of research is quantitative research using observational studies with the Cross Sectional Study approach**.**

#### *Population and Sample*

The population in this study were all employees working at RSUD Haji of South Sulawesi Province. The sample of this study was 240 people. The sampling technique in this study is Stratified Random Sampling.

### Method of Collecting Data

The instrument used in data collection was a questionnaire. There are two endogenous variables, namely work engagement and performance and exogenous variables namely job embeddedness. The measurement used in the data processing is to use a Likert scale, where respondents state the level of agreement or disagreement regarding various objects regarding the behavior of objects, people, or events[6].

## Results

#### *Characteristics of respondents*

Table 1. Showing the characteristics of respondents. Most of the respondents in RSUD Haji are at the age level of 20-35 years (40.4%). In terms of gender, the majority of respondents were female, with 155 respondents (64.6%).

**Table 1. Frequency Distribution of General Characteristics of Respondents in RSUD Haji Of South Sulawesi Province**

| Characteristics of respondents | | N | % | Total |
|---|---|---|---|---|
| Age | 20-35 years | 97 | 40.4 | 240 |
| | 36-45 years | 88 | 36.7 | |
| | > 45 years | 55 | 22.9 | |
| Gender | Male | 85 | 35.4 | 240 |
| | Female | 155 | 64.6 | |

***Cont...*** **Table 1. Frequency Distribution of General Characteristics of Respondents in RSUD Haji Of South Sulawesi Province**

| | | | | |
|---|---|---|---|---|
| Years of Service | 1-2 years | 45 | 18.8 | 240 |
| | 3-4 years | 65 | 27.1 | |
| | 5-6 years | 32 | 13.3 | |
| | > 6 years | 98 | 40.8 | |
| Last Education | SLTA | 40 | 16.7 | 240 |
| | Diploma | 86 | 35.8 | |
| | S1 | 99 | 41.3 | |
| | Others | 15 | 6.2 | |
| Employment status | Civil servants | 106 | 44.2 | 240 |
| | Non Civil Servants | 130 | 54.1 | |
| | Others | 4 | 1.7 | |

***Univariate analysis***

Table 2 explains the percentage of respondents' ratings of the research variables.The results of the study that for the job embeddedness variable which stated good at 45% of employees and those that stated poor at 55% of employees, for the work engagement variable that stated good at 42.9% of employees and those that stated poor at 51.7% of employees for, and for performance variables that state good at 39.2% of employees and those that state bad at 60.8% of employees.

**Table 2. Frequency Distribution of Respondents Based on Research Variables at RSUD Haji of South Sulawesi Province**

| **Variables** | **RSUD Haji** | |
|---|---|---|
| | **N** | **%** |
| Job Embeddedness | | |
| c. Good | 108 | 45.0 |
| d. Poor | 132 | 55.0 |
| Work Engagement | | |
| c. Good | 103 | 42,9 |
| d. Poor | 137 | 57,1 |
| Performance | | |
| c. Good | 94 | 39,2 |
| d. Poor | 146 | 60,8 |
| Total | 240 | 100 |

***Bivariate analysis***

There was an influence of the job embeddeness variable on work engagement with value of p = 0,000 <0.05 which means that the job embeddedness variable has a significant influence on work engagement, there is an influence of the work engagement variable on performance with a value of p = 0,000 <0.05 which means that the work engagement has a significant influence on performance in RSUD Haji, Table 3.

**Table 3. Comparison of Sig. in the Anova Table to Test the Effect of Job Embeddedness and Work Engagement Variables on Employee Performance Improvement at RSUD Haji Of South Sulawesi Province**

| No. | Variables | Nilai Sig. (tabel Anova) |
|---|---|---|
| | | RSUD Haji |
| 1. | Job Embeddedness | 0,000 |
| 2. | Work Engagement | 0,000 |
| 3. | Performance | 0,000 |

Multivariate Analysis

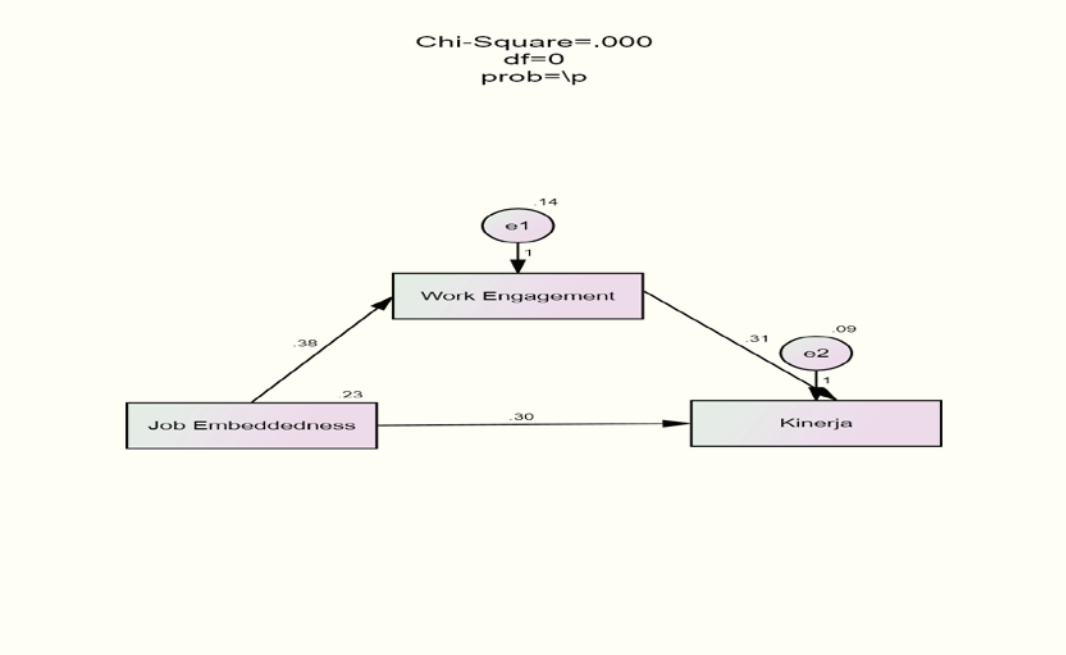


**Figure 1. Analysis of the Path between Job Embeddedness, Work Engagement and Performance**

The picture above explains how closely the direct or indirect influence between variables, namely between the job embeddedness variable to the performance variable through work engagement. Path analysis shows between variables based on a hypothesis. The influence of job embeddedness to work engagement obtained p value (0.000) <0.05 which means that there is an influence of job embeddedness to work engagement with a large influence of 0.376 which means that if job embeddedness increases by 1 point, work engagement will increase by 0.376 points.

## Discussion

### *The Influence of Job Embeddedness on Employees Performance*

The results of this study are supported by Baihaqi (2018) based on inferential statistical analysis using path analysis, states that there is an influence between job embeddedness on employee performance that has been proven and the hypothesis is proven and can be accepted. This can be seen from the value of sig. = 0,000 which is smaller than 0.05. Based on data collection from respondents it was found that the application of on the job embeddedness was not good and the performance of its employees was good.

Based on the results of research conducted, it is found that employees in RSUD Haji still have discrepancies/ incompatibility of employees with work performed so that it causes discomfort and feels that RSUDHaji is not a career destination, the employee's relationship with the work environment has not been well established, and employees have not fully felt lost either material and psychology when leaving work.

Overall, the results of this study indicate that the majority of respondents lack job embeddedness. Employees need to have attachment to the organization and community, so as to make the individual feel comfortable, feel emotions and positive perceptions about the work environment so that it can affect the performance of employees. Mitchell et al[3] explained that employees who feel a connection and attachment in the work environment and their organization will tend to survive and improve their performance with the work he has now so that employees can have a high sense of job embeddedness.

### *The Influence of Job Embeddedness on Work Engagement*

Work engagement is a business management concept that states that employees who have high engagement are employees who have full involvement and have a high work spirit in their work and in matters and related to the company's long-term activities. In other words, the definition of work engagement refers to the involvement, satisfaction and enthusiasm of employees at work[7].

Based on the results of the statistical analysis, it is known that job embeddedness influences work engagement in RSUD Haji. It is important for managers to strengthen work engagement, because employees who are not engaged are the center of the problem if workers lose commitment and motivation and enthusiasm in working[8]. The results of this study are in line with research conducted by Raymond William Ring[9] which states that shows that four of the six dimensions of Job Embeddednes make a significant and unique contribution to Work Engagement. Organizational engagement is positively related to work involvement.

Overall, the results of this study indicate that the majority of respondents lack work engagement. Employees need to have attachment and attachment to their work. There is a positive organizational support associated with welfare at work, so that arises a strong sense of enthusiasm and attachment to work in providing services to patients.

### *The Influence of Work Engagement on Employees Performance*

According to Sinambela[10] argues that employee performance is defined as the ability of employees to do certain skills. Employee performance is very necessary, because with this performance will be known how far the ability of employees in carrying out the tasks assigned.

Based on the results of the statistical analysis conducted, it is known that Work engagement has an influence with the performance of employees in RSUD Haji. The lack of employee engagement not only impacts performance but also increases the desire to move, decreases customer service satisfaction and increases absenteeism.

This is in line with research by Yudha & Fikri[12] which shows that there is a relationship between work engineering and performance at Aisyiyah Hospital in Pariaman City. The effective contribution of the work engagement variable to the performance of the R-square value was obtained, amounting to 26.6%.

Overall, the results of this study indicate that the majority of respondents have low performance. Organizational goals will be difficult or even cannot be achieved if employees do not have good performance,

so they cannot produce good output as well. Employees need to have a sense of attachment and enthusiasm for their work. There is a positive organizational support associated with welfare at work, so that arises a strong sense of enthusiasm and attachment to work in providing services to patients so that it can affect the performance of employees.

***The Indirect Influence of Job Embeddedness on Employees Performance through Work Engagement***

One hypothesis in this study is to see how the direct influence and indirect influence between job embeddedness on performance through work engagement. Based on the results of the analysis conducted using path analysis it was found that indirectly job embedness through work engagement had no direct influence on performance.

There are many things that have been proven to affect individual performance, but during the last decade, a new concept has been developed which is predicted as one of the predictors of performance, namely job embeddedness (Lee, Mitchell, Sablynski, Burton, & Holtom,[12] Sekiguchi, Burton, & Sablynski[13];Wheeler, Harris, & Sablynski[14] from the results of the study, it was found that job embeddedness is related to performance, both directly and indirectly. Performance can affect the ongoing activities of a company organization, the better the performance shown by employees will be very helpful in the development of the organization or company.[14-16]

## Conclusion

The conclusion of this study is that there is an influence on job embeddedness on employee performance, there is an influence on job embeddedness on work engagement, there is an influence on work engagement on employee performance, and indirectly job embedness through work engagement does not have a direct influence on performance.

**Ethical Clearance-** Taken from University ethical committee

**Source of Funding-** Self

**Conflict of Interest –** Nil

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# Study of Tobacco Smoke and Pregnancy Outcome

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## Abstract

**Introduction**. Pregnant women have a risk for tobacco smoke both actively and passively. Pregnant women are usually exposed to enviromental tobacco smoke (ETS) in various places with different duration of time. Cigarette smoke has a severe effect not only on pregnant women but also on the fetus.**Methods** Various references were collected from online database including reports, journals, mostly in the last 10 years. The journals were mostly from the scholarly journals.

**Results**. Tobacco smoke can effect the immunity, hormonal and metabolic system of the pregnant woman, therefore disturbing the growth of the fetus. Tobacco smoke also known to increase the risk of premature birth and reduce gestational age. Tobacco smoke cause several problems in newborn such as respiration distress, low birth weight (LBW), neural disorder, sudden infant death syndrome (SIDS) and congenital anomaly.

**Conclusion**. The effect of tobacco smoke, actively of passively, have worse outcome for the pregnant women and their babies.

***Keyword**: Pregnancy Outcome, tobacco smoke, ETS, LBW, preterm birth.*

## Introduction

Smoking pregnant women have an increased risk of having an ectopic pregnancy, spontaneous abortion and other complications leading to pregnancy complications as well as the placenta. The fetus also has the risk of exposure to tobacco smoke, more than thousands of types of hazardous chemicals, especially nicotine, tar and carbon monoxide can have an effect on the fetus and cause unwanted disorders or abnormalities[1].

Environmental tobacco smoke (ETS) is a complex mixture consisting of most of the smoke emitted from the smoker's body, the smoke produced by burning cigarettes and the surrounding air[2]. Exposure of ETS in pregnant women causes increased levels of carbon monoxyde (CO), nicotine and cotinin in maternal serum or urine, in the fetus and in amniotic fluid. The effect of ETS on pregnant women can occur from the first semester to the third semester. Pregnant women are usually exposed to ETS in various places with different duration of time. Places that have the potential to become ETS exposure locations include at home, at work and the outside environment[3].

Tobacco smoke and pregnancy

One effect of the cigarette smoke exposure on pregnant women is its effect on the mother's immune system. In pregnancy changes occur in the mother's immune system to prevent rejection of the fetus. Exposure to ETS can cause changes in the immune system of pregnant women. Changes include an increase in activated leukocytes and a decrease in the percentage of regulator T lymphocyte cells (Treg cells). Smoking

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during pregnancy also affects the function balance between Th1 cells (T helper lymphocytes) and Th2 cells, causing an increase in the production of cytokines, proinflammatory chemokines and Th1 growth factors. In addition, the percentage of macrophages and NK cell residues is higher in smokers in the first semester

The activation of nicotine receptors causes the release of acetylcholine, dopamine, serotonin, growth hormones and adrenocorticotropic hormones and glutamate, these hormones significantly influence fetal growth. Smoking is also associated with changes in metabolism during pregnancy.[4]

Exposure to nicotine in pregnant women can cause vascular placental vasoconstriction, decrease placental blood flow and reduce trophoblast invasion which results in inhibition of good placental circularization leading to placental hypoxia causes disruption of placental invasion. Placenta previa is a form of placental invasion disorder[4]. Nicotine can cause a significant decrease in the mitotic potential of cytotrophoblast tissue in vitro. This effect is also found in smoker women. This effect can explain the mechanism of impaired placental development during the early phases of pregnancy due to placental ischemia which can cause fetal death[5]. Low placental weight strongly related with LBW[6].

Beside nicotine and cotinin, CO levels are also the found highest in smokers. The presence of CO in the body causes oxygen binding to hemoglobin decrease due to the higher affinity of hemoglobin for CO. CO Exposure to the fetus prevents the release of oxygen and then converted to carboxyhemoglobin. The result is a decrease in tissue oxygenation through competitive inhibition with oxyhemoglobin. Prolonged CO exposure in pregnant women can cause significant permanent damage to the brain of a fetus which sensitive to hypoxia. Nicotine is also considered to have a bad effect due to the stimulation of nicotine cholinergic receptors and their neuroteratogenicity effects.[4,7,8] Nicotine also interferes with the micro RNA which is important for the maturation of fetal stem cells.[9]

The effects of tobacco smok on the fetus are considered to be multifactorial, including indirect effects such as poor nutritional status associated with anorexiagenic effects of nicotine exposure, and CO. Placental blood flow decrease is associated with the vasoconstrictive effect of catecholamines released from adrenals and nerve cells after nicotine exposure.[10]

**Tobacco Smoke and Preterm Birth**

In Europe rates of preterm births are reported between 5 - 9%, while in developing countries and the United States the rate of preterm births reaches 12%. The cause of preterm birth is often difficult to determine. Some risk factors associated with preterm birth include excessive distension of the uterus, low economic status and smoking[11]. Elective preterm birth may be associated with cigarette-related obstetric complications such as placenta previa, placental abruption and impaired fetal growth. Research shows that smoking during pregnancy increases the risk of preterm birth by 25%. The exposure of ETS also specifically has an influence on preterm birth[12,13].

Active smoker mothers have been accepted as a risk for preterm birth, for around 14% of preterm births. One mechanism that links cigarette exposure with preterm birth is the CYP1A1 genotype and GST (glutathione S-transferase). Abnormalities in these genes make mothers more vulnerable to exposure to hazardous substances such as cigarette smoke.[14] Cotinin levels as an indicator of cigarette exposure are also strongly related to preterm birth[4] The danger of non-smoking tobacco is also seen in the research of Munmun et al. Which shows that non-smoking tobacco (chewed and swallowed) increases the risk of preterm birth.[15]

There are four mechanisms proposed by Goldstein et al explain relationship between smoking and preterm birth: (a) Decreased maternal appetite caused by smoking leading to a decrease in nutrition for the fetus, (b) vasoconstriction caused by smoking results in decreased blood supply to the fetus, reduced fetal nutritional supply and slowing the release of catabolism results, (c) cigarettes may have a direct effect of toxins on the fetus and (d) increase in fetal CO levels causes reduced oxygen transport capacity and teratogenic properties.[11,16]

Prostagladin has been known to trigger labor. Prostaglandin levels such as F2-isoprostane as a marker of oxidative stress are found in the amniotic membrane and amniotic fluid in smokers. F2-isoprostane levels increased 3 times compared to non-smokers. Increased

F2-isoprostane levels is considered as a mechanism that associated smoking and preterm birth. Smoking is also considered to increase the sensitivity of the uterus to contractile hormone. Research by Egawa et al in mice shows that inhalation of cigarette smoke increases the contractile activity and sensitivity of myometrium to oxytosis.[11,17] Cadmium found in tobacco smoke interacts with calcium and effects myometrial activity. Cadmium may modulate the function of the oxytocin receptors in the myometrium. Increased levels of cadmium in pregnant women are found to be associated with an increased risk of preterm birth.[11,18] Another condition associated with preterm birth is necrotizing-enterocolitis (NEC)[19]

**Spontanious Abortion**

Spontaneous abortion or miscarriage is one of the most common pregnancy complications, about 12-26% of known pregnancies. Generally the literature on the relationship between smoking and abortion does not show any consistency although some studies have concluded that smoking can cause abortion. A meta-analysis study by Pineles et al. Showed the relative risk of abortion during pregnancy is 1.32. The risk of abortion increases with the number of cigarettes. One cigarette per day increases the risk of abortion by 1%. Secondary smokers have an 11% increased risk of abortion.[20]

**Tobacco Smoke Effect on Newborn**

Various studies provide an overview of the effects of cigarette smoke on fetal growth and development during pregnancy and infant growth and development after birth

**Respiratory Disorder**

Smoking during pregnancy can cause the newborn's lungs failed to reach maximum function and continues with decreased lung function. Preterm births in most smokers also cause disruption of lung maturation. Diseases caused by these infants include wheezing, bronchitis, hospitalization due to lung infections and asthma in children.[21]

Generally, children who are exposed to nicotine during pregnancy also experience exposure to cigarette smoke in childhood. This raises the question whether the increased risk of asthma is caused by exposure to prenatal or post natal cigarette smoke. Research by Pattenden et al showed that exposure to cigarette smoke during pregnancy without post natal exposure still shows an association with an increased risk of asthma.[22,23] Exposure to cigarette smoke pre natal and post natal also shows an imbalance of Th1/Th2 causes susceptibility of airway reactivation.[24]

The mechanism of exposure to nicotine causes various pathological conditions in the lungs is not yet fully understood, but based on some data it was found that nicotine causes various anomalies in the lungs. Histological studies in animals show goblet cell hypertrophy after nicotine exposure, and it is associated with asthma in the community.[22,25,26]

***Low Birth Weight***

Low birth weight babies are the variables most widely studied the effect of smoking mothers during pregnancy or exposure to cigarette smoke in pregnant women on pregnancy outcomes. Data shows that LBW is more common in smokers (12.4%) compared to nonsmokers (7.7%). Women who smoke have a 1.5 to 3.5 times greater risk of giving birth to LBW, and the risk increases along with the cigarette consumption.[1]

Lee et al study showed that exposure to ETS in pregnant women also has the potential to cause LBW, and the effect of smoking on LBW from active smokers has the same mechanism as the effect of smoking on LBW in secondary smokers. The risk of small infants according to pregnancy is also increased in the group of mothers with high ETS exposure compared with mothers with low ETS exposure[27]

**Behaviour and Neural Disorder**

Nicotine exposure to the fetus can affect fetal brain development[10]. A study in Finland shows that heavy nicotine exposure caused the infant born with attention deficit / hyperactivity disorder (AHDH) or attention deficit / hyperactive disorders.[28] Fetuses exposed to tobacco smoke during pregnancy ware found to have a risk of cardiac autonomic abnormalities during sleep especially in preterm babies. Changes in autonomic activity are at risk of causing neurological and cardiological complications[29].

**Sudden infant death syndrome (SIDS)**

One of the most severe complications of nicotine exposure in pregnancy is sudden infant death syndrome or SIDS. The cause of SIDS is not clearly known in infants less than one year old suddenly die without definite explanation even after a thorough investigation. Exposure to nicotine is known to be a risk factor for SIDS, but the mechanism of nicotine exposure that causes infant death is unclear and is still being debated. But some animal studies provide some clues.[22,30,31]

**Congenital Anomaly**

The effects of tobacco smoke on infanst congenital anomalies have been investigated. Exposure to tobacco smoke is known to be associated with fetal heart defects including atrial septal defects, atrioventricular septal defects, transposition of large arteries, craniosynostotic cleft palate and gastroschisis.[4,33.]

## Conclusion

Tobacco smoke effect the immunity, hormonal and metabolic system in pregnant women. The substance found in tobacco smoke were found to be the cause of some pregnancy complication leading to poor pregnancy outcome such as preterm birth, spontaneous abortion, and adverse effect on tha infants. The infants could suffer respiratory disorder, behavior and neural disorder, SIDS and another congenital anomaly.The effect of tobacco smoke, actively of passively, associated with poor outcome for the pregnant women and their babies.

**Ethical Clearance**- Taken from University ethical committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

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# Environmental Factors and Use of Protective Personal Equipment for the Prevention of Covid-19 in 3 Large Cities in Indonesia (Jakarta, Surabaya and Makassar)

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## Abstract

In Indonesia, data from May 19, 2020 showed confirmed cases of 18,496 and 1,221 deaths. Data as of May 18, 2020, DKI Jakarta became the province with the highest cases in Indonesia, reaching 6,059 cases. The other highest case is Surabaya City, East Java Province which ranks second, with 2,296 cases. In addition, South Sulawesi Province became the province with the highest cases outside Java, amounting to 1,064 as of 19 May 2020. SARS-CoV-2 is transmitted mainly through droplets, therefore PPE (Personal Protective Equipment) is one of the most effective methods of preventing transmission. The method in this research is a qualitative method with a case study approach model. The approach model focuses on gathering various information from several sources such as documents, field surveys, observations, interviews, and detailed recordings. Data collection was carried out based on the number of cases infected in 3 major cities of Indonesia (Jakarta, Surabaya and Makassar).The results showed COVID-19 cases in Jakarta, Surabaya and Makassar continued to experience an increase in cases every day. As of March 3-April 19, 2020 confirmed 3033 cases in Jakarta, in Makassar City as many as 453 confirmed cases from March 3-April 25 2020. In Surabaya City there were 392 confirmed cases from March 23-April 28, 2020. Increasing the number of positive cases, in three big cities Makassar, Surabaya and Jakarta because there are still many people who do not follow government regulations related to social distancing. The COVID-19 transmission pathways are breathing and contact, therefore proper use of PPE will be able to prevent the transmission of Cov-2 SARS. However, the availability of PPE sometimes becomes a barrier because strategies are needed to facilitate the availability of PPE

***Keywords:*** *Personal Protective Equipment, Covid-19, Preventing transmission*

## Introduction

The number of cases in DKI Jakarta reached 6059 cases as of May 18, 2020, with the number of death cases reaching 463 cases. Until now, DKI Jakarta is still the province with the highest number of cases in all of Indonesia.

The number of cases in East Java reached 2296 cases as of May 18, 2020, with the number of death cases reaching 209 cases. This makes East Java Province as the province with the second highest number of cases in Indonesia after DKI Jakarta Province. The city with the highest number of cases in East Java Province is Surabaya City, with the number of confirmed cases reaching 1,109 cases and 132 deaths[1].

The number of cases in South Sulawesi reached 1064 cases as of May 19, 2020 with a cumulative number of death cases reaching 55 cases. This resulted in South Sulawesi Province being included in one of the provinces with the highest number of cases in Indonesia. Until May 19, 2020, the number of cases in Makassar City had reached 627 cases. This makes Makassar City one of the cities with the highest number of cases in Indonesia[2].

Personal protective equipment (PPE) is one of the effective methods of preventing transmission during rational use. The PPE component consists of gloves,

face masks, protective goggles or face shields, and long-sleeved non-sterile gowns. Personal protective equipment will be effective if supported by administrative controls and environmental and technical controls. Rational use of PPE is assessed based on the risk of exposure and transmission dynamics of the pathogen[3].

Lack of PPE availability either because the number of patients has jumped sharply or due to the production of PPE that can not meet the needs so that a situation like this is determined by the leadership of the Fasyankes as a crisis period. This alternative is given as a consideration to meet the needs of using PPE in treating patients with COVID-19. 3 APD is a strategic issue related to handling Corona virus in Indonesia. Due to lack of PPE many medical personnel are infected with this virus and must be treated. Even though health workers are at the forefront and demanded to be alert to deal with this virus. On the one hand, the fact is the number of health workers is lacking. Health workers must be protected and given adequate PPE, because of their strategic role in handling Covid-19. We worry that if they are not protected then many health workers will be infected and observed for 14 days or isolated, causing a domino effect. Namely, the reduced number of health workers who can help deal with the virus.

## Materials and Method

The method used is a qualitative method with a case study approach model. Case studies are one model approach that focuses on gathering various information from several sources such as documents, field surveys, observations, interviews and detailed recordings (Prihatsanti, Suryanto and Hendriani, 2018). Data collection was carried out based on the number of cases infected with Covid-19 in 3 major cities in Indonesia (Jakarta, Makassar and Surabaya).

## Results

### 1. Results of Covid-19 Disease Cases in Jakarta

**Table 1. Table of Positive Cases, ODP, and PDP Covid-19 in Jakarta**

| Date | Positive | PDP | ODP |
|---|---|---|---|
| 3 March 2020 | 3 | 24 | 215 |
| 4 March 2020 | 3 | 56 | 241 |
| 5 March 2020 | 7 | 83 | 267 |
| 6 March 2020 | 7 | 88 | 304 |
| 7 March 2020 | 7 | 98 | 356 |
| 8 March 2020 | 7 | 127 | 362 |
| 9 March 2020 | 34 | 166 | 378 |
| 10 March 2020 | 34 | 197 | 401 |
| 11 March 2020 | 36 | 209 | 445 |
| 12 March 2020 | 62 | 238 | 486 |
| 13 March 2020 | 72 | 261 | 586 |
| 14 March 2020 | 79 | 289 | 660 |
| 15 March 2020 | 95 | 308 | 695 |
| 16 March 2020 | 97 | 330 | 813 |
| 17 March 2020 | 122 | 374 | 862 |
| 18 March 2020 | 160 | 374 | 862 |
| 19 March 2020 | 221 | 480 | 976 |
| 20 March 2020 | 224 | 505 | 1209 |
| 21 March 2020 | 268 | 528 | 1376 |
| 22 March 2020 | 307 | 646 | 1447 |
| 23 March 2020 | 356 | 765 | 1612 |
| 24 March 2020 | 427 | 849 | 1811 |
| 25 March 2020 | 472 | 899 | 1872 |

***Cont...*** **Table 1. Table of Positive Cases, ODP, and PDP Covid-19 in Jakarta**

| | | | |
|---|---|---|---|
| 26 March 2020 | 515 | 916 | 1940 |
| 27 March 2020 | 566 | 940 | 1924 |
| 28 March 2020 | 603 | 985 | 2200 |
| 29 March 2020 | 701 | 1046 | 2289 |
| 30 March 2020 | 727 | 1085 | 2300 |
| 31 March 2020 | 741 | 1156 | 2349 |
| 01 April 2020 | 816 | 1196 | 2394 |
| 02 April 2020 | 909 | 1202 | 2468 |
| 03 April 2020 | 990 | 1955 | 2481 |
| 04 April 2020 | 1071 | 2040 | 2451 |
| 05 April 2020 | 1151 | 2091 | 2515 |
| 06 April 2020 | 1299 | 2225 | 2566 |
| 07 April 2020 | 1443 | 2254 | 2598 |
| 08 April 2020 | 1552 | 2254 | 2598 |
| 09 April 2020 | 1719 | 2327 | 2865 |
| 10 April 2020 | 1810 | 2353 | 2872 |
| 11 April 2020 | 1903 | 2379 | 2873 |
| 12 April 2020 | 2082 | 2395 | 2897 |
| 13 April 2020 | 2242 | 2405 | 2917 |
| 14 April 2020 | 2349 | 2446 | 2977 |
| 15 April 2020 | 2447 | 2457 | 2991 |
| 16 April 2020 | 2670 | 2465 | 3040 |
| 17 April 2020 | 2819 | 2867 | 3779 |
| 18 April 2020 | 2902 | 5155 | 5684 |
| 19 April 2020 | 3033 | 5227 | 5862 |
| | | | |

Sumber: covid19.sulselprov.go.id, 2020

From 3 March 2020 to 19 April 2020 the total number of positive cases of Covid 19 was 3033 cases, for PDP there were 5227 cases and ODP were 5862 cases.

2. Results of Covid-19 Disease Cases in Makassar

**Table 2. Table of Positive Cases, ODP, and PDP Covid-19 in Makassar**

| Date | positive | PDP | ODP |
|---|---|---|---|
| 3 March 2020 | 0 | 0 | 0 |
| 4 March 2020 | 0 | 0 | 0 |
| 5 March 2020 | 0 | 0 | 0 |
| 6 March 2020 | 0 | 0 | 0 |
| 7 March 2020 | 0 | 0 | 0 |
| 8 March 2020 | 0 | 0 | 0 |
| 9 March 2020 | 0 | 0 | 0 |
| 10 March 2020 | 0 | 0 | 0 |
| 11 March 2020 | 0 | 0 | 0 |
| 12 March 2020 | 0 | 0 | 0 |
| 13 March 2020 | 0 | 0 | 0 |

***Cont...*** **Table 2. Table of Positive Cases, ODP, and PDP Covid-19 in Makassar**

| | | | |
|---|---|---|---|
| 14 March 2020 | 0 | 0 | 0 |
| 15 March 2020 | 0 | 0 | 0 |
| 16 March 2020 | 0 | 0 | 0 |
| 17 March 2020 | 0 | 0 | 0 |
| 18 March 2020 | 0 | 0 | 0 |
| 19 March 2020 | 2 | 0 | 0 |
| 20 March 2020 | 2 | 0 | 42 |
| 21 March 2020 | 2 | 27 | 50 |
| 22 March 2020 | 2 | 28 | 95 |
| 23 March 2020 | 2 | 29 | 114 |
| 24 March 2020 | 4 | 53 | 149 |
| 25 March 2020 | 13 | 89 | 158 |
| 26 March 2020 | 27 | 81 | 182 |
| 27 March 2020 | 29 | 77 | 284 |
| 28 March 2020 | 33 | 80 | 365 |
| 29 March 2020 | 48 | 92 | 496 |
| 30 March 2020 | 50 | 105 | 620 |
| 31 March 2020 | 50 | 106 | 691 |
| 01 April 2020 | 65 | 110 | 1072 |
| 02 April 2020 | 66 | 123 | 1305 |
| 03 April 2020 | 80 | 172 | 1691 |
| 04 April 2020 | 80 | 233 | 2072 |
| 05 April 2020 | 82 | 263 | 2166 |
| 06 April 2020 | 112 | 282 | 2308 |
| 07 April 2020 | 112 | 306 | 2399 |
| 08 April 2020 | 128 | 324 | 2430 |
| 09 April 2020 | 138 | 329 | 2511 |
| 10 April 2020 | 168 | 346 | 2581 |
| 11 April 2020 | 178 | 383 | 2650 |
| 12 April 2020 | 222 | 382 | 2672 |
| 13 April 2020 | 223 | 404 | 2762 |
| 14 April 2020 | 231 | 420 | 2749 |
| 15 April 2020 | 240 | 427 | 2752 |
| 16 April 2020 | 248 | 461 | 2799 |
| 17 April 2020 | 369 | 560 | 3206 |
| 18 April 2020 | 374 | 601 | 3270 |
| 19 April 2020 | 387 | 617 | 3334 |
| 20 April 2020 | 397 | 637 | 3356 |
| 21 April 2020 | 419 | 661 | 3589 |
| 22 April 2020 | 432 | 706 | 3617 |
| 23 April 2020 | 440 | 768 | 3730 |
| 24 April 2020 | 440 | 784 | 3762 |
| 25 April 2020 | 453 | 781 | 3781 |

Sumber: covid19.sulselprov.go.id, 2020

The number of cases is increasing every day. Regarding from 3 March 2020 to 25 April 2020 the total number of positive cases of Covid 19 was 453 cases, for PDP there were 781 cases and ODP was 3781 cases.

3. Results of Covid-19 Disease Cases in Surabaya City

**Table 3. Table Number of Covid-19 Patients in Surabaya City**

| Date | Positive | PDP | ODP |
|---|---|---|---|
| 3 March 2020 | 23 | 7 | 135 |
| 24 March 2020 | 29 | 8 | 182 |
| 25 March 2020 | 29 | 8 | 182 |
| 26 March 2020 | 31 | 16 | 189 |
| 27 March 2020 | 31 | 34 | 193 |
| 28 March 2020 | 31 | 34 | 193 |
| 29 March 2020 | 38 | 61 | 206 |
| 30 March 2020 | 38 | 66 | 207 |
| 31 March 2020 | 38 | 73 | 237 |
| 01 April 2020 | 41 | 137 | 258 |
| 02 April 2020 | 41 | 229 | 508 |
| 03 April 2020 | 74 | 221 | 575 |
| 04 April 2020 | 77 | 251 | 653 |
| 05 April 2020 | 84 | 309 | 814 |
| 06 April 2020 | 84 | 318 | 832 |
| 07 April 2020 | 84 | 367 | 1056 |
| 08 April 2020 | 84 | 416 | 1056 |
| 09 April 2020 | 93 | 448 | 1167 |
| 10 April 2020 | 97 | 497 | 1255 |
| 11 April 2020 | 97 | 519 | 1290 |
| 12 April 2020 | 180 | 502 | 1360 |
| 13 April 2020 | 208 | 523 | 1398 |
| 14 April 2020 | 228 | 536 | 1447 |
| 15 April 2020 | 244 | 585 | 1560 |
| 16 April 2020 | 246 | 634 | 1658 |
| 17 April 2020 | 250 | 669 | 1728 |
| 18 April 2020 | 270 | 703 | 1806 |
| 19 April 2020 | 299 | 745 | 1892 |
| 20 April 2020 | 299 | 795 | 1941 |
| 21 April 2020 | 310 | 829 | 2007 |
| 22 April 2020 | 315 | 870 | 2072 |
| 23 April 2020 | 325 | 895 | 2125 |
| 24 April 2020 | 327 | 935 | 2196 |
| 25 April 2020 | 368 | 948 | 2232 |
| 26 April 2020 | 367 | 1004 | 2278 |
| 27 April 2020 | 372 | 1036 | 2314 |
| 28 April 2020 | 392 | 1056 | 2364 |

Based on the table above it can be seen that the number of cases is increasing every day. Regarding from 23 March 2020 to 28 April 2020 the total number of positive cases of Covid 19 was 392 cases, for PDP as many as 1056 cases and ODP as many as 2364 cases.

## Discussion

Environmental factors include physical factors such as geology and climate, biological factors such as insects that transmit agents, and socioeconomic factors such as crowding, sanitation, and the availability of health services. The physical environment, such as a slum area, will speed up the transmission of the virus due to the large number of contacts between humans. The number of facilities and medical devices (laboratories) is also an influential factor. While the socio-cultural environment in question is the existence of events or activities that gather people[4].

The most important benefit of PHBS is the creation of a community that is health conscious and has the provision of knowledge and awareness to live life behaviors that maintain hygiene and meet health standards. Creating a healthy environment will be able to prevent the spread of disease, the community will use health facility services and be able to develop health sourced from the community[5]. PHBS is one way to prevent someone from being infected and COVID-19 transmission. PHBS is implemented by routinely washing hands with soap and running water, using self-protection tools, such as masks, and applying the ethics of coughing and sneezing[3,5].

Furthermore, regarding climate and geology was discussed by the Indonesian Research Institute (LIPI). The result, air temperature, sunlight, and humidity levels affect the speed, death of the Covid-19 virus in the air and on non-porous surfaces. Clearly, the COVID-19 virus can be transmitted in all areas, including areas with hot and humid weather, can attack anyone and anywhere, regardless of race or geographical location[6,7].

Furthermore, the increase in the number of positive cases in the 3 major cities of Makassar, Jakarta and Surbaya is because there are still many people who do not follow government regulations related to social interaction restrictions or social distancing. This is in line with the events that occurred in Lampung, an increase in the number of people infected with the Corona virus in March 2020 in Lampung due to activities that gather many people (Sri, 2020).

The main transmission pathways of COVID-19 are breathing and contact. Sprinkling of breathing originates from coughing or sneezing of an infected person and anyone who has close contact with someone who has symptoms of respiratory problems (such as sneezing and coughing) at risk of infected splash. In the results of studies that have been carried out the risk of being infected with the COVID-19 virus from the feces of an infected person seems to be low. Some studies suggest that the COVID-19 virus might cause intestinal infections and can be found in feces[9-11].

• For the general public, people who experience symptoms that show COVID-19 or who treat COVID-19 patients at home should get a medical mask and instructions for use. Further information can be seen in the home care guide for COVID-19 patients with mild symptoms and management of their contacts. Further information can be seen in the recommendations regarding the use of masks in the community, during treatment at home, and in health care facilities in the context of COVID-19. Coordinate PPM supply chain management mechanisms PPD management should be coordinated through national and international supply chain management mechanisms that include but are not limited to: • Estimated use of PPE based on a rational quantification model to ensure the rationalization of the requested inventory, • Monitoring and controlling PPE requests from countries and responding parties with a large number of members; • Promotion of a centralized demand management approach to avoid duplication of inventory and ensure strict compliance with essential inventory management rules to limit disposal, excess inventory, and lack of inventory; • Monitoring overall PPE distribution; • Monitoring and controlling PPE distribution from medical facility warehouses.

## Conclusion

The Covid-19 pandemic still attacks Indonesia today. One of them is that the increase in Covid-19 cases is still very massive in three big cities, namely Jakarta, Surabaya and Makassar. PSBB is a step implemented by the state to combat Covid-19. However, there are still many violations that occur so that transmission is still

very high. In the PSBB, the PPE factor also determines the success of the PSBB in decreasing cases and breaking the chain of transmission. However, PPE is still very difficult to access by the community to this day. Though PPE like a mask is the main weapon to fight viruses such as Covid-19.

**Ethical Clearance**- Taken from Hasanuddin University ethical committee

**Source of Funding-** Self

**Conflict of Interest** – Nil

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# The Influence of Body Image towards Self-Esteem, Self-Compassion and Psychological Well-Being in Female Exerciser

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## Abstract

Human development is a process of change that occurs throughout life. In adulthood, there are many changes in as such as cognitive, socio-emotional and physical changes. Body image is an individual experience in the form of perceptions of body shape and weight, as well as behaviours that lead to an individual's evaluation of his physical appearance. Body image in women is very influential on their psychological factors such as self-esteem, self-compassion and psychological well-being. Sample of this research consisted of as many as 100 female excersicer. The research was conducted in Lapangan Merdeka, Lapangan Cadika, and Lapangan Teladan, Medan. Data were analysed by using simple logistic regression test and multiple logistic regression. The results of bivariate analysis found, the variables of self-esteem and self-compassion have an influence on body image in female exercisers with the value $p<0.05$. From the results of multivariate analysis, it is obtained that the value $p>0.05$, which means there is no relationship between self-esteem, self-compassion, and psychological well-being to body image. The results show that there is no relationship between self-esteem, self-compassion and psychological well-being to body image in female exerciser, these variables do not have a dominant influence meaning, all the three variables have the same influence on body image. Further findings show that self-esteem has a greater influence to body image on female exerciser.

***Keywords:*** *Body Image, Self-Esteem, Self-Compassion and Psychological Well-Being*

## Introduction

At the age of 18-29 years old, body weight in women continues to increase with a percentage of 10.6% to 17.8%[1]. Based on the results of the 2013 Riset Kesehatan Dasar (Risekdas) data, the prevalence of obesity in Indonesia in 2007, in adolescence and adulthood was 13.9% in men and 23.8% in women. In 2013, the national prevalence of obesity in women was higher than in men, which was 32.9% in women and 19.7% in men. In general, females tend to feel they have a negative body shape or size[2]. A study said only 33% of women said they had the ideal body shape and size, while 58% said they wanted to lose weight. Females tend to think that their body size is too big.

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Body image is influenced by several factors such as culture, gender, mass media, parents and family members, interpersonal relationships, self esteem, comparison of others, and the learning process[3,4]. Self-esteem is an important factor in the development of body mage. Those with higher self esteem tend to develop a positive body image. On the contrary, those with lower self esteem tend to develop a negative body image[5]. Self esteem is a person's attitude based on perceptions about how a person values himself as a whole, both in the form of a positive attitude and a negative attitude.

Cash and Fleming[5] revealed that body image has an important role in the physical and psychological health condition of women. Psychological wellbeing is a concept that involves three things in general, namely subjective, social and psychological and health-related behaviors[6]. Psychological wellbeing is an important thing for a female. A good psychological wellbeing can

make someone feel satisfied with herself, maximize one's potential to the fullest and build a good relationship with others, because she does not see the deficiencies or dissatisfaction in her.

## Materials and Method

### Sample

The sample in this study consisted of 100 female exerciser with an age range of 21 to 60 years.

### Instrument

This research used four measuring instruments which have been translated to Bahasa Indonesia, including: 58 items of Coopersmith's Self-Esteem Inventory scale, 25 items of Neff's (2003) Self-Compassion Scale, and 42 items of Psychological Well-Being Scale by Ryff. The body image variable research instrument used in this study was prepared based on the theory of Cash (2000) which consists of 30 items.

### Analysis Method

The data analysis method used in this study is multivariate analysis using a simple logistic regression test.

## Results

### Univariate Analysis

Univarate analysis aims to determine the frequency distribution of the characteristics of each variable studied. The results of the frequency distribution research showed that 51% (51 respondents) of 100 female respondents who worked out had a high body image and 49% (49 respondents) had a low body image in Lapangan Merdeka, Lapangan Cadika, Lapangan Teladan Medan

**Table 1. The distribution of body image respondent on female exercisers 2019**

| Body Image | | n | Percentage |
|---|---|---|---|
| 1. | High | 51 | 51 |
| 2. | Low | 49 | 49 |
| Total | | 100 | 100 |

### Demographic.

In tihs study, the characteristics of respondents included age, marital status, reasons for exercising, duration of exercise, frequency of exercise in a week. Based on the results of the study, from 100 respondents it is known that as many as 56% (56 reponden) are at the age range of 25-40 years, while minorities are found in the age range of > 60 years with the total of 1% (1 responden). Based on marital status, the majority of respondents were married with the total of 60% (60 respondents). Based on the reasons for exercising, as many as 86% (86 respondents) exercised to improve their health. Based on the length of workout, as many as 65% (65 respondents) had performed excercise for 1-5 months, while the minority of respondents or as many as 10% (10 respondents) had performed exercise for > 12 months. Based on the duration of exercise, the majority of respondents or as many as 49 people performed exercise for 15-30 minutes, while 1% (1 respondent) of the respondents performed exercise for 61-100 minutes. Based on the frequency of exercise in one week the majority of respondents or as many as 62% (62 respondents) performed exercise for 3-5 times / week.

Respondents description based on exercise factor.

Based on the results, it is found that femlae exerciser at Lapangan Merdeka, Lapangan Cadika, Lapangan Teladan Medan 2019 based on self-esteem variables, the majority of high self-esteem factor was 53% (53 respondents). Based on the self-compassion factor, the majority of high self-compassion was 51% (51 respondents). Based on psychological well-being factor, the majority of psychological wellbeing was 52% (52 respondents).

### Bivariate Analysis

The influence of self-esteem, self-compassion and psychological well-being on body image in female exerciser.

Based on the results of the Simple Logistic Regression test, the effect of Self Esteem, Self Compassion and Psychological Wellbeing on Body Image in Lapangan Merdeka, Lapangan Cadika, Lapangan Teladan Medan in 2019. Can be seen in the following table 2:

**Table 2. The influence of self-esteem, self-compassion and psychological well-being on body image in female exercisers**

| Variable | Body Image | | | | Total | | P | OR 95% CI |
|---|---|---|---|---|---|---|---|---|
| | High | | Low | | | | | |
| | n | % | n | % | n | % | | |
| Self Esteem | | | | | | | | |
| a. High | 34 | 64,2 | 19 | 35,8 | 53 | 100 | 0,006 | 3,158 |
| b. Low | 17 | 36,2 | 30 | 63,8 | 47 | 100 | | (1,394-7,156) |
| Self Compassion | | | | | | | | |
| a. High | 32 | 62,7 | 19 | 37,3 | 51 | 100 | 0,018 | 2,659 |
| b. Low | 19 | 38,8 | 30 | 61,2 | 49 | 100 | | (1,186-5,964) |
| Psychological wellbeing | | | | | | | | |
| a. High | 31 | 59,6 | 21 | 40,4 | 52 | 100 | 0,074 | 2,067 |
| b. Low | 20 | 41,7 | 28 | 58,3 | 48 | 100 | | (0,931-4,588) |

Based on the data, it is found that self esteem affects the body image of female exerciser, $p<0.005$, OR :3.158 with 95% CI: 1.394 - 7.156. Female with higher self esteem has a 3.158 times greater chance of having a higher body image compared to female with lower self esteem. Furthermore, there is a significant effect of self compassion on body image on female exerciser, $p<0.005$, OR: 2,659 with 95% CI: 1,186-5,964 which means that women with higher self compassion have a 2.659 times greater chance of having a high body image compared to female with lower self compassion.

Based on the result, there is no significant effect of psychological wellbeing on body image of female exerciser, $p> 0.005$

*Multivariate Analysis*

To analyze the relationship between the three independent variables on body image on female exerciser, multiple logistic regression test was used, because the dependent variable is in two categorized, high and low. Multivariate analysis with multiple logistic regression (multiple logistic regression) tests to find the most dominant variable related to body image in female exerciser. Of all the independent variables there are p values <0.25 which are varied entered into the multivariate model as in the following table*:*

**Table 3. p-value < 0,25 Independent Variable**

| Variable | p-value |
|---|---|
| Self Esteem | 0,006 |
| Self Compassion | 0,018 |
| Psychological wellbeing | 0,074 |

As for the independent variable in this study, include self-esteem, self-compassion and psychological well-being. Analysis test result is presented in following table 4:

**Table 4. Multiple logistic regression model of body image in female exercisers**

| Variabel | B | P | Exp B | 95% CI | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| Self Esteem | 0,482 | 0,343 | 1,62 | 0,598 | 4,392 |
| Self Compassion | 0,766 | 0,184 | 2,152 | 0,695 | 6,661 |
| Psychological Wellbeing | 0,193 | 0,695 | 1,213 | 0,462 | 3,181 |
| Constant | -0,731 | 0,028 | 0,481 | | |

Based on the results of the multiple logistic regression analysis with the enter method shows that when the variables of self esteem, self compassion and psychological well-being are seen together it turns out that the three variables are not related to body image in women who exercise with a value of p> 0.05, so that the variable does not statistically have a dominant effect.

## Discussion

*The influence of self-esteem on female exerciser's body image*

Based on the results of bivariate analysis, there is a significant influence between self esteem and body image on female exerciser. The results of simple logistic regression tests reveals that the value of p = 0.006 which is less than α = 0.05, then Ha is accepted. Furthermore, the results of multivariate analysis reveals that self esteem is the most important factor in women's body image p = 0.184; OR = 2,152. The results of this research are in accordance with the results of research conducted by Zhafirah and Dinardinata[7] which stated that self-esteem had a contribution to body image in women. The higher ones self-esteem, the higher body image they have and vice versa.

Self-esteem is a predictor of satisfaction toward body image in women and becomes a concern for physical appearance. A study states that women with higher self esteem tend to evaluate their physical appearance positively[8]. Another study states that self-esteem works better to predict risk factors for dissatisfaction with body image in women[9].

In general, women are more likely to perceived they have a negative body image. A study revealed that women who exercised regularly would have better self-evaluation, health and exercise orientation and better self-esteem. In addition female exercisers tend to have satisfaction with a higher body image so that they respect themselves more[10].

Women with concern on body shape and appearance will tend to exercise with the aim of shaping their bodies to be ideal and reducing dissatisfaction with their body shape[11]..

*The influence of self-compassion on female exerciser's body image*

Based on the bivariate test results it can be seen that there is a significant effect between self-compassion and body image on female exerciser. This is in accordance with the results of the simple logistic regression test with a value of $p = 0.018$ which is smaller than $\alpha = 0.05$, then Ha is accepted. It shows that the higher self-compassion in a person, the higher one's body image. The results of this study are in line with the results of previous studies which stated that the higher the self-compassion a person has, the less dissatisfaction of his body image[12]

*The influence of psychological well-being on female exerciser's body image*

The bivariate results show that there is no effect of psychological well-being on body image in female exerciser. It can be seen from the results of simple logistic regression test calculations with a value of $p = 0.074$, then Ho is accepted. Assessment of a person's body image has an impact on health, psychological well-being and quality of life in a woman[12]. The results of the study are different from research Kartikasari[13] who said that the lower the body image dissatisfaction, the higher the psychological well-being and vice versa. Other research also shows that psychological well-being has a significant effect on body image satisfaction

[14]. A negative body image brings a person to a feeling of low self-esteem and low self-compassion which affects happiness and psychological well-being. A study said that there is a correlation between body image and self-esteem, someone with negative body image may have negative self-esteem. This will affect one's psychological well-being. Body image has an impact on health, psychological well-being and quality of life in a woman[12].

Body perception has a relationship with self-esteem and psychological well-being in someone[15]. The researchers revealed that dissatisfaction with body shape was associated with various forms of psychopathology such as depression and anxiety disorders[16,17]. Other studies explain that young adult women associate their physical appearance with overall self worth and psychological wellness more than men[18]. Neff and Pommier[19] found that attention to body image is high in adult women and is positively related to happiness and subjective well-being.

## Conclusion

Based on the results shows that the variables of self-esteem, self-compassion and psychological well-being are not related to body image on female exerciser. In conclusion, these variables do not statistically have a significant effect on body image. It is found that self-esteem is the most influential predictor on female exerciser's body image. Another factor such as self-compassion affects the body image on female exercisers. Moreover, there is no influence of psychological well-being on female exerciser's body image.

**Ethical Clearance**- Taken from university ethical committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

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# A qualitative Study of Accessibility Health Services among Communities on Small Islands in Makassar City

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## Abstract

This study aims to explore barriers to access in health services among small islands in Makassar City.

This research is qualitative research through content analysis by observing phenomena that occur based on the accessibility framework of Levesque, et.al. Data collection was carried out through in-depth interviews with 8 key informants and 9 other informants (n = 17).

This study found that geographical factors (distance, travel time, and transportation costs) were the main considerations in utilizing primary health services in the small island communities around Makassar City which were predominantly fishermen. The two closest islands (Barrang Caddi and Bone Tambung), have enjoyed easy access and free service for Universal Health Coverage (UHC) achievements.

It is different from the outer islands, especially Langkai and Lanjukang, although most of the residents already have National Health Insurance (NHI) they have difficulty using their cards due to geographical constraints. Moreover, fishermen often go fishing for days, becoming another obstacle in accessing quality health facilities available in Makassar City.

Various efforts have been made by the Makassar City Health Office to address the disparity in health services in the islands in Barrang Caddi, such as the use of sea ambulances, and regular visits. The marine ambulance is only one ship on standby between two public health centers in another village office if there is an emergency patient who must be referred to a hospital in Makassar City.

This disparity in access to health services triggers injustice among residents of the islands in the Makassar City area. Very contractual with the slogan: "Makassar City of the World".

This study revealed a special transportation need in the form of a very simple capacity sea ambulance and managed by island community communities that are not reached by sea ambulances from the public health center.

***Keywords:*** *access barriers, small islands, marine ambulance, five dimensions Levesque, Makassar city.*

## Introduction

In the last decade, Makassar was introduced as a 'world city', increasing the cooperation of various countries (sister cities) including waste management, creative industry development, human resource capacity building, and tourism sector development cooperation.

Makassar City is an old city in eastern Indonesia, as a center for transit and education trade. Makassar City has 12 small inhabited islands stretching along the urban coastline as part of the 210 Spermonde islands in the Makassar Strait.

Most of the population lives on the coast and islands, then known as coastal communities. Most of the island's

coastal population is looking to work as a fisherman, depending on the season.[1]

Since the launch of the Universal Health Coverage (UHC) program in Indonesia, most of the population has been able to access the available health services.[2,3]. In Makassar City, the coverage of National Health Insurance (NHI) membership reached 80 percent. Nevertheless, there are still imbalances in health services, especially residents who live on the outer islands of Makassar City. Even among the islands, there are still those who do not yet have health service facilities such as the Supporting Community Health Centers (Pustu).

This study aims to explore the accessibility of health services in the small island communities in Makassar based on the concept of accessibility of Levesque, et.al. includes five dimensions of accessibility including dimensions of approachability, acceptability, availability and accommodation, affordability, and appropriateness to have health services needs fulfilled.[4]

## Materials and Method

This research is qualitative research through content analysis by observing phenomena that occur based on 5 dimensions of accessibility from Levesque, et.al. Data collection was carried out through in-depth interviews with 8 key informants and 9 other informants (n = 17).

The design is considered following this study which aims to explore the 5 dimensions of accessibility based on Levesque, et.al[4] including dimensions of approachability, acceptability, availability and accommodation, affordability, and appropriateness to have health services needs fulfilled.

Data collection was carried out through in-depth interviews with 8 key informants who were deemed to meet the competencies to be studied and 9 other informants (*n = 17*) as having used or were currently using available health services.

Data analysis uses content analysis to analyze the phenomena found in this study.

## Results

This research explores 5 dimensions of health service accessibility according to Levesque, et.al. [3] includes dimensions of closeness (approachability), acceptance (availability ability), availability (availability and accommodation), the ability of users (affordability), and appropriateness to enjoy quality, equal and affordable health services to small island communities on the coast of Makassar City.

1. The dimension of Proximity (approachability)

The proximity dimension covers geographical aspects (distance traveled, travel time, and transportation costs), and health insurance coverage (JKN / KIS)

Distance to health services in Makassar City, between 11 - 46 km, the closest is Barrang Caddi Island and the farthest is Lanjukang Island.

As an example :

*"The distance to the nearest island is about 11 km, and the outermost island is around 46.5 km" (IS, 51 years)*

Travel time between 30 minutes to 4 hours.

"The travel time to Bone Tambung Island and Barrang Caddi is around 30-45 minutes. Whereas to the outer islands around 4 hours, if the weather is good. (KS, 39 years)

Traveled using a 40 PK outboard motorboat with a capacity of 30 passengers, or a rented lifeboat.

As an example :

"Generally passengers use wooden boats carrying 30 people, with rent of Rp. 15,000, - one way to the nearest island. While the outer islands do not yet have public transportation, if you do not have your boat you have to rent a special around Rp. 250,000 - one way "(GSS, 46 years)

It is different if only using the available health facilities on the island in the form of a Puskemas Assistant (Pustu), the location is in the middle of a settlement, so there are no obstacles.

In the region of Barrang Caddi, holders of the Healthy Indonesia Card (KIS) as proof of the National Health Insurance (JKN), still around 70-80 percent have it.

As an example :

*"Coverage of health insurance coverage has not been exhaustive, only about 70-80% have in the Barrang Caddi Village. (MB, 45 years)*

2. Acceptability dimensions

The acceptability dimension includes perceptions of service quality and discrimination in health services for vulnerable groups

3. Service Quality Perception

As an example :

*"..... Public Health Center Assistant (Pustu) is very petrified within the community fulfillment of health services there are also Integrated Service Post (Posyandu) which every month weighing babies. " (IS, 50 years old)*

b. Discrimination Services

As an example :

"Nothing, everything is served by both the rich and the poor National Health Insruance (NHI) members or Social Security Agency of Health (SSAH) Independent." (IS, 50 years)

3. Dimensions of Availability (availability and accommodation)

The availability and accommodation dimensions include infrastructure, health equipment, pharmaceuticals (medicines), and health workforce resources.

a. Infrastructure

As an example :

*"The health service infrastructure already exists but is not sufficient enough, it still needs to be equipped so that the quality of service is adequate. Another problem, if there are emergency patients who must be referred to the Public Health Center or Hospital in Makassar City, there is no medical transportation available. (AR, 43 years old)*

b. Medical tools

As an example :

*"It is said to be adequate, not much is lacking, but there is still something that can be used by medical personnel here. (MB, 45 years old)*

c. Pharmacy (medicine)

As an example :

"*It's still very lacking because the Pustu still sometimes lacks the medicine here" (MU, 37 years)*

d. Health personnel resources

As an example :

*"The available HR for health workers is not sufficient due to the lack of interest of health workers to be placed on the coast, so currently they only rely on human resources for health workers who live on the island." (MS, 39 years old)*

4. Dimensions of user capability (affordability)

The dimensions of user affordability include the description of community work and the level of income.

a. Job description

As an example :

"The work of the community is around 80% anglers, 10% traders, approximately 9% work in the city, and approximately 1% government employees. (MSB, 39 years old)

5. The appropriateness dimension

Dimensions of service suitability (appropriateness) in the form of the appropriateness of requests with services received, and perceptions of services provided following the provider.

a. Appropriate requests with services received

As an example :

*"The health services provided are as requested when the community comes for treatment at the Pustu. Many withered patients (decompressors) who are unable to be treated by a Pustu, must be referred to the hospital. Sometimes patients get frustrated because their illnesses don't heal and medical treatment costs are expensive, eventually resigned. "(MSB, 51 years old)*

b. Perception of services provided following the provider

As an example :

*"We do not open certain hours for examinations, patients can come to the Pustu at any time when they need health care. Both in terms of schedule and time of health workers never provide limits to the community. " (HA, 33 years old)*

## Discussion

This study revealed that since the implementation of the Universal Health Coverage (UHC) program in Indonesia since 2014, the majority of Indonesia's population has been covered by the national health insurance system (NHI) and has enjoyed the available health services[2;3]. In Makassar City, about 80 percent of the fishing communities in the five groups of Barrang Caddi Island have owned National Health Insurance (NHI) as Recipients of Contribution Aid (PBI) for the poor and disadvantaged groups since 2014.

Nevertheless, there are still residents who experience obstacles in accessing available health services due to geographical dimensions (distance, travel time, transport costs), and are not covered by National Health Insurance (NHI), as is the case in remote China.[5,6]

The islands closest to Makassar City such as Barrang Caddi Island, the community can enjoy quality health services in Makassar City almost every day while shopping for their household needs or purchasing merchandise supplies. They have felt the impact of equality in accessing health services according to the UHC program.[2,8]

The results of research by Laksono A.D, et.al. shows that adults living in urban areas tend to use hospital outpatient facilities 1.3 times higher than adults living in rural areas. The likelihood of utilizing outpatient and inpatient facilities at the same time is 1.2 times higher in adults living in urban areas than in rural areas.[10]

Different conditions are felt for residents of the outer islands such as Langkai Island and Lanjukang Island in accessing available health services. The main obstacles in the form of geographical access (distance traveled, travel time, transport costs), including not yet covered by National Health Insurance (NHI). The outer islands such as Lanjukang Island have no health facilities at all, causing residents to have to cross to other nearby islands to get primary health care.

The fate of the inhabitants of the outer islands in Makassar City who generally work as fishermen is not as good as the rural population in Indonesia, where most of the low-income villagers have enjoyed the available health services.[3;9]

Some residents prefer to become traditional divers fishermen chasing high-value species such as sea cucumbers, even though they know the risk is heavy. No wonder, if there are some traditional diver fishermen in the Barrang Caddi Island group found to suffer from decompressors (DCS) even at a young age. The same thing is found in sea cucumber fishermen on the Yucatan Peninsula, Mexico[11] Prolonged treatment time and direct and indirect costs[12], cause decompressor patients to become apathetic. Patients with decompressors (DCS) in Taiwan have a 3.8-fold risk of experiencing psychiatric disorders, and a 5.7-fold risk of sleep disorders[13].

Makassar's slogan "City of the World", feels bitter for a group of fishermen on the outer islands that are neglected. Urban and provincial health facilities even at the national level are available only for the inhabitants of the outer islands of the region.

Unfair access has hampered opportunities for outermost island patients to obtain appropriate health services based on their perception of care needs. This requires consideration not only of service availability but also the quality of care[14-21.]

The urgent need is to provide simple capacity marine ambulances on each island to transport emergency patients. As is the desire of the small island community to manage marine ambulances for emergency patients managed by the local fishing community. [15-18] Speed up the coverage of National Health Insurance (NHI) membership for all residents of the small islands in the coastal city of Makassar in accordance with the mandate of Universal Health Coverage (UHC) so that there are no more populations that are not covered by national health insurance (NHI), especially the poor and poor.

## Conclusions

Around 80 percent of the people in the Barrang Caddi Island group has been covered by National Health Insurance (NHI) and are used to obtain the needed health services, especially fishing communities who live on islands closest to Makassar City such as Barrang Caddi Island.

There is still an imbalance in access to health services, especially in the outer islands of Makassar due to geographical constraints (distance, travel time, transportation costs), and lack of National Health Insurance (HHI).

The discovery of decompressor patients requires special attention to treatment efforts.

**Ethical Clearance**- Taken from university ethical committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

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# Environmental Pollution and Health Problems Due to Forest Fires with Co2 Parameters

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## Abstract

Today, air pollution is a serious problem faced by industrial countries. The impact caused by air pollution is not only a direct impact on human health, but also can damage the environment. One of the sources of air pollution are now common is the forest fires which generate a compound emissions are carbon dioxide ($CO_2$).Several studies in the medical literature documenting a causal link between air pollution, especially $CO_2$ and negative impacts on health after short-term exposure, especially the unknown long-term health consequences of exposure to pollution. Some studies related to fire management models and $CO_2$ emission reductions of them use the method of mapping risk of forest fires and the use of reforestation and the elimination of illegal logging is considered effective to implement.

***Keyword:*** *Air pollution, forest fires, carbon dioxide*

## Introduction

Today, air pollution is a serious problem faced by industrial countries. Air pollution raises a very adverse impact. The impact caused by air pollution is not only a direct impact on human health, but also can damage the environment.

One of the sources of air pollution are now common is their forest fires. One of emissions contained in air pollution as a result of the forest fires are compounds of carbon dioxide ($CO_2$).[1]

$CO_2$ emissions and global warming potential to be one of the considerationsbiggest environmental problems today. Due to the increase global population and industrial development quite rapidly result in the concentration of $CO_2$ in the atmosphere has grown an average of 2 ppm / year for the last 10 years.[2]

## Materials and Method

In this literature review, keywords used to get a reference to a related article is “air pollution”, “forest fires” and “carbon dioxide”. The scope of the literature review will be limited beginning in 2011 to the top with the goal of search engines can produce journals - journals and references are more focused on development problems and solutions. Reference is also limited in the famous journal, namely Science Direct, because the journal can be accessed free of charge. Search results using keywords found about 6,200 research articles and 7,800 books. However, based on the criteria of the carbon dioxide, only 12 articles were reviewed,

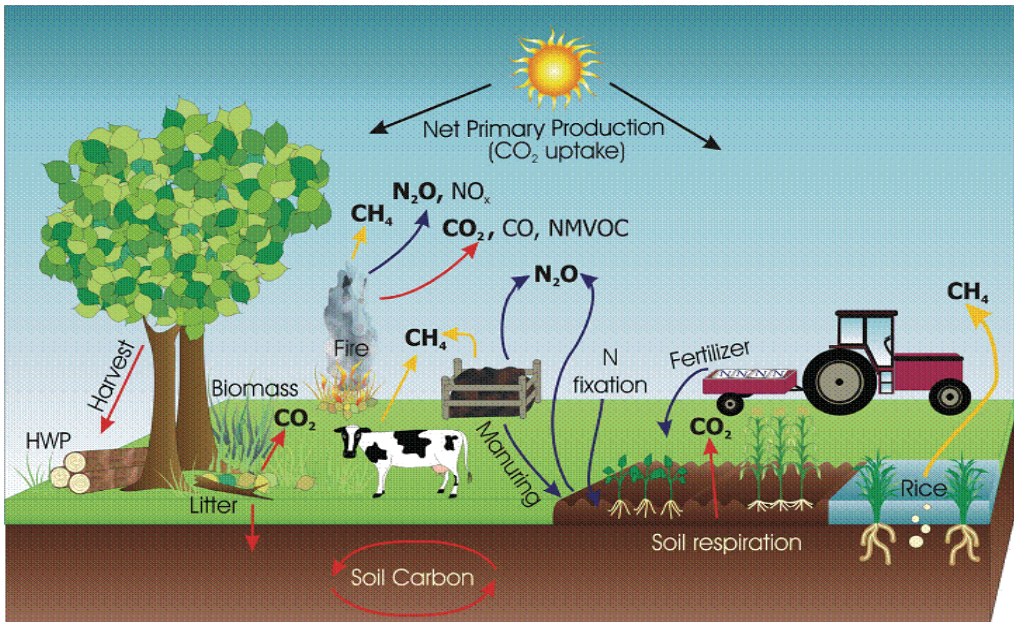
## Result and Discussion

*Air Pollution, Forest Fire and Carbon*

Air pollution can be defined an activity in the atmosphere, where the concentration of the substance - a substance that is sufficiently high and is above the ambient value and can have an impact - the impact on humans, animals, vegetation, or material. In addition to disrupting the aesthetics, small-sized particles in the air can be inhaled into the respiratory system and cause respiratory illness and lung damage. Particles that get into the respiratory system will be set aside depending on the diameter.[3]

One of the sources of air pollution are now common is their forest fires. One of emissions contained in air pollution as a result of the forest fires are compounds $CO_2$.[4]

$CO_2$ is actually a component compound that naturally exist in the air. Effect of CO2 is called the greenhouse effect of $CO_2$ in the atmosphere which can absorb heat energy and obstruct the course of the heat energy from the atmosphere to the surface is higher.[(5)]




**Picture 1**

Cycle greenhouse gas

*Transport, transfer and accumulation of $CO_2$*

The oceans play an important role for the distribution of this is because the $CO_2$ concentration at the level of atmospheric $CO_2$ that is controlled by the concentration of $CO_2$ in the oceans. Cycle $CO_2$ in the oceans separated in two senses, namely $CO_2$ natural and anthropogenic $CO_2$. Since the increase of anthropogenic $CO_2$ in nature, the sea has a role as an absorber of anthropogenic $CO_2$ to maintain the balance of the Earth system. On the other hand, the increase in this concentration in the feared sea will also affect the balance mechanism existing systems in it. Therefore, the amount of $CO_2$ that accumulates in the water column and how its distribution among the oceans of the world, will continue to be examined from year to year due to increased concentrations of anthropogenic $CO_2$ in the atmosphere.[6]

$CO_2$ in the atmosphere is also absorbed by plants through photosynthesis berhijau leaves, but the amount of $CO_2$ available to that used by plants on the earth is not balanced anymore. The more $CO_2$ and other greenhouse gases in the atmosphere, the more infrared radiation is absorbed, the higher the intensity of the greenhouse and consequently the temperature at the earth's surface is also higher.[5]

Diffusion of $CO_2$ from tissues to the bloodstream and lungs are also caused by the pressure difference of $CO_2$. $CO_2$ pressure in tissues, veins, arteries, and alveoli. Therefore, the $CO_2$ in the network will be transported to the alveoli in the lungs.Literature and scientific documents relating to $CO_2$ inhalation exposure effects on human health and psychomotor performance, linear physiological changes in the circulatory system, cardiovascular and autonomic on exposure to $CO_2$ concentrations in the range of 500-5000 ppm. Human experimental studies explain that short-term exposure to $CO_2$ begins at 1000 ppm affect cognitive performance including decision-making and problem solving. Changes in the autonomic system for low-level exposure to $CO_2$ may involve this effect. Further research is needed on the long-term effects of exposure to low levels of $CO_2$ in the autonomous system. A number of epidemiological studies show a link between low-level exposure to $CO_2$ ranging from 700 ppm and symptoms associated with the building. Respiratory symptoms indicated in children who are exposed to indoor $CO_2$ concentrations

higher than 1000 ppm. However, in other comorbidities pollutants may be involved in these effects.[6]

The amount of $CO_2$ that accumulates in the water column and how its distribution among the oceans of the world, will continue to be examined from year to year due to increased concentrations of anthropogenic $CO_2$ in the atmosphere.[7]

*Impact on the environment*

Population growth and the use of fossil fuels at the same time as the main energy source in the region has led to the release of more $CO_2$ into the atmosphere with negative consequences on the environment.[8]

$CO_2$ is a greenhouse gas implicated in global warming trend. Snow and ice have declined closure, the ocean temperature has increased and the level of the ocean's surface also increased over the last century. Rising sea levels could submerge many areas. Extreme weather conditions are causing droughts, floods and typhoons, as well as the distribution of disease-causing organisms may occur predictability.[9]

*Health impacts caused*

Several studies in the medical literature documenting a causal link between air pollution and negative health outcomes immediately after exposure, much less is known long-term health consequences of exposure to pollution. A study using Indonesia's forests in 1997 as a natural experiment, which estimates long-term effects of air pollution on health outcomes that take advantage of the properties of longitudinal from Indonesia Family Life Survey (IFLS), by collecting individual data detail about many health outcomes, both in Discovered in 1997 and 2007. the significant negative impact of pollution, which survive in the long term. Men and older people most impacted, while the children seemed to recover almost completely from this initial shock. For the whole population,[10]

Judging from some of the literature and scientific documents relating to $CO_2$ inhalation exposure effects on human health and psychomotor performance. Linear physiological changes in the circulatory system, car-diovaskular, and autonomous exposure to $CO_2$ concentrations in the range of 500 to 5000 ppm. Human experimental studies have suggested that exposure to short-term $CO_2$ begins at 1000 ppm affect cognitive performance including decision-making and problem solving. Changes in the autonomic system for low-level exposure to $CO_2$ may involve this effect. Further research is needed on the long-term effects of exposure to low levels of $CO_2$ in the autonomous system. A number of epidemiological studies show a link between low-level exposure to $CO_2$ ranging from 700 ppm and symptoms associated with the building. Respiratory symptoms indicated in children who are exposed to indoor $CO_2$ concentrations higher than 1000 ppm.

However, in other comorbidities pollutants may be involved in these effects. In the context of a significant linear increase of the global ambient $CO_2$ concentrations caused by anthropogenic activities and resources, reduce $CO_2$ levels in the room through the vents to the ambient air is increased energy consumption in air-conditioned buildings. To control $CO_2$-efficient energy in the building from the surrounding air, the rise in atmospheric $CO_2$ concentration needs to be suppressed. In the context of a significant linear increase of the global ambient $CO_2$ concentrations caused by anthropogenic activities and resources, reduce $CO_2$ levels in the room through the vents to the ambient air is increased energy consumption in air-conditioned buildings. [6]

**Handling Model That Can Be Applied**

One of the research related to overcoming the problem of forest fires by using Data Base Inventory of Forest Resources, based on four aspects topographical factors, human activities, climate and forest characteristics. A conceptual framework for mapping the risk of fire is developed by integrating Database Forest Resource Inventory. Potential risks of forest fires and map the risk zone in the Chinese heritage sites was assessed using GIS.[11]

Research presents the results of a study of absorption and reduction of carbon dioxide emissions with the use of ecosystem services in the nature reserve (reforestation) and the elimination of illegal logging in the state of the newly formed ijevan, located in Tavush region of the Republic of Armenia.[12]

*Resistance*

In general, the fires caused by three major factors

that fuel conditions, weather and culture, including the lack of public awareness of the importance of forest preservation. All three of the above are causing difficult implemented regulations on forest fires.[4]

*Success*

Improvements in the estimation of the risk of forest fires and fire risk zone mapping is essential to reduce the negativethe impact of fires and to facilitate the planning of the protection of forested areas. The success of the methodthe estimated risk of forest fires and fire risk zone mappingsimply and reliably to assess the potential risk of forest fires and map the forest fire zones in a place with little historical data about the fire. This method helps provide reference for decision makers to prioritize areas for conservation of cultural resources and / or culture, and enhance the practical application of fire prevention and suppression.[11]

Meanwhile, the results of studies related to the absorption of $CO_2$ emissions was found that forest ecosystems asylum state ijevan 440.7 metric can absorb carbon and can reduce $CO_2$ emissions each year. And the elimination of illegal logging, the number could increase carbon sequestration. As a result the amount of carbon dioxide in the atmosphere will be reduced 39.07 metric. Research on $CO_2$ reduction with reforestation system and the elimination of illegal logging are found it turns out the value of carbon sequestration forest ecosystem services by lead economic benefits will be surplus.[12-16]

**Ethical Clearance**- Taken from university ethical committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

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# The Effect of Giving Date Palm Juice on the Duration of the First Stage of Labor in Sele Be Solu Hospital, Sorong City

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## Abstract

The maternal mortality rate (MMR) in the world in 2017 is 216 per 100.00 live births and 99% of them are due to childbirth problems in Indonesia. One of the causes of maternal mortality in Indonesia is prolonged labor. The labor process requires optimal energy and stamina. One intake of energy/nutrition for childbirth is Date Palm juice, a mixture of 100 grams of dates with ± 200 cc of water blended using a blender. The purpose of this study was to determine the effect of dates palm juice on the duration of the first stage of labor in Sele Be Solu Hospital in Sorong City.

The research design uses Quasy Experiment (quasi-experimental) with Non-equivalent Posttest Only Control Group. Time and place of research 20 May - 15 June 2019 at Sele Be Solu Regional Hospital, Sorong City. A sample of 32 respondents using purposive sampling technique. The independent variable was giving of date palm juice and the dependent variable was the normal labor duration of the first stage of labor. Data collection used observation sheets and partographs. Statistical analysis using Independent T-Test with a significance level of 0.05. After giving date palm juice to the intervention group p-value = 0,000 α = 0.05 was obtained. There is an effect of Date Palm juice to facilitate normal labor duration of the first stage at Sele Be Solu Regional Hospital in Sorong City.

***Keywords:*** *Labor, First Stage, Date Palm Juice*

## Introduction

The labor process requires optimal energy and stamina, but there are still practices that limit food and fluid intake during labor. This is a need that must be fulfilled properly by the mother during the delivery process. Restrictions on food and beverage intake during labor can cause hypoglycemia and dehydration in labor which can affect contractions so that it can inhibit the progress of labor[1].

In dates palm and every 100 grams of dates palm contain 247-93 calories, 7.0-26.1 grams of moisture, 1.7-3.9 grams of protein, 0.1-1.2 grams of fat, 72 carbohydrates , 9-77.6 grams, 2.0-8.5 grams of fiber, calcium 59-103 mg, iron 3.0-13.7 mg, potassium (potassium) 648 mg, vitamin A 15.60 mg, vitamin B1 0.03-0.09 mg, vitamin B2 0.10-0.16 mg, niacin (vitamin B or becomplex) 1.4-2.2 mg, tryptophan (oxytocin) 10-17 mg, phosphorus 72 mg.[2]

Dates contain oleic and linoleic which contribute to the provision of prostaglandins which function to strengthen and stretch the muscles of the uterus. Additionally, dates affect oxytocin receptors and make the uterine muscles respond better to oxytocin, resulting in much more effective uterine contractions[3]. Giving nutrition during labor must be absorbed by the body quickly and practically, one of the alternatives that can be used is to provide date palm juice. Giving date palm juice is one of the natural, non-invasive, effective, economical and safe methods for maternity mothers because date palm juice can be quickly absorbed by the body after consumption.

The labor process requires optimal energy and stamina. This is a need that must be fulfilled properly by the mother during the birth process, one of the intakes of energy and nutrition to expedite the delivery process, namely date palm juice. Date palm juice contains carbohydrates high enough to be useful for adding and storing maternal energy in labor. Dates palm affect the

oxytocin receptors and make the uterine muscles respond better to oxytocin, resulting in much more effective uterine contractions. Therefore, the date palm is very good to be used as a date juice (Cut Mutiah Journal of the Midwifery Study Program at the Langsa Poltekes Aceh, 2017 and Ayu S. Kinanti).

Based on the background above, the authors are interested in researching" The Effect of Giving Date Palm Juice on the Duration of the First Stage of Labor in Sele Be Solu Hospital, Sorong City".

## Materials and Method

The research design used was the Quasy Experiment (quasi-experimental) with the Non-equivalent Posttest Only Control Group Design approach. This research was conducted at Sele Be Solu District Hospital in Sorong City, Sorong City.

In this study there are two variables, including date palm juice as the independent variable and the normal labor duration of the first stage which is the dependent variable.

The population in this study were first-time mothers in the Sele Be Solu District Hospital in Sorong City. The total number of respondents in the first stage of maternity in the Sele Be Solu Regional Hospital in Sorong City was obtained from the period June 1 - December 31, 2018 totaling 550 people. And the period January - February 2019 numbered 139 people with an average per month there were 70 normal maternity mothers.

The sample in this study was 32 first-stage mothers in labor who had inclusion criteria as follows: The mothers who enter the active phase of the first stage of labor and those who were willing to be respondents. Exclusion criteria included Mothers with high risk and complication labor.

After that the mothers who were in the process of the first stage were asked for approval to get some information and biodata of the mother. Before consuming palm juice, researchers first explained the SOP of making palm juice, then each respondent was given 200 cc of palm juice to be spent in the first stage of the process and after that the researcher observed the respondents in the first stage of the process. Labor is said to be normal if the duration of the first stage of labor for primigravida is 12-14 hours and for Multigravida 6-8 hours. Labor is said to be abnormal if the length of the first stage of labor for primigravida > 14 hours and in Multigravida> 8 hours.

## Results

**a) Frequency Distribution Based on Parity.**

**Table 1. Frequency Distribution Based on Maternity Parity in Sele Be Solu Regional Hospital in Sorong City.**

| Group | Parity | Frequency (Σ) | Percentage (%) |
|---|---|---|---|
| Controls | Primi | 5 | 16 |
| | Multi | 11 | 34 |
| intervention | Primi | 2 | 6 |
| | Multi | 14 | 44 |
| Amount | | 32 | 100 |

Based on table 1 above shows that parity in the control group for primipara has the lowest frequency of 5 mothers (16%), for multipara has the highest frequency of 11 mothers (34%). Whereas parity in the intervention group for primipara had the lowest frequency of 2 mothers (6%), for multiparas having the highest frequency of 14 mothers (44%).

b) **Results of Measurement of the Normal Labor Duration in the Control Group without giving date palm juice.**

**Table 2. The First Stage Maternity Mother in Sele Be Solu District Hospital in Sorong City in the Control Group without giving date palm juice.**

| TABULATION OF CONTROL GROUPS | | | | |
|---|---|---|---|---|
| **Normal Labor Duration** | **Primi** | **Multi** | **Frequency (Σ)** | **Percentage (%)** |
| Normal | 3 | 6 | 9 | 56 |
| Abnormal | 2 | 5 | 7 | 44 |
| Amount | 5 | 11 | 16 | 100 |

Table 2 shows the results that research respondents with primipara experienced normal labor duration by 3 respondents with a percentage (56%) and research respondents with primipara experienced abnormal labor duration by 2 respondents with the percentage (44%) while the research respondents with multipara experienced normal labor duration by 6 respondents with a percentage (56%) while the research respondents with multipara experienced abnormal labor duration by 5 respondents with a percentage (44%).

**c) Results of Measurement of the Normal Labor Duration of Labor in the Intervention Group by giving Kurma Juice.**

**Table 3 The First Stage of labor at Sele Be Solu District Hospital in Sorong City in the Intervention Group by giving Kurma Juice.**

| TABULATION OF INTERVENTION GROUP | | | | |
|---|---|---|---|---|
| **Normal Labor Duration** | **Primi** | **Multi** | **Frequency (Σ)** | **Percentage (%)** |
| Normal | 0 | 12 | 12 | 75 |
| Abnormal | 2 | 2 | 4 | 25 |
| Amount | 2 | 14 | 16 | 100 |

Table 3 shows the results that respondents with primipara experienced a smooth delivery process by 0 respondents with a percentage (75%) and research respondents with primipara experienced by not going smoothly by 2 respondents with the percentage (25%) while the research respondents with multipara experienced a normal labor duration process by 12 respondents with a percentage (75%) while the research respondents with multipara experienced abnormal labor duration process by 2 respondents with a percentage (25%).

**d) Normality Test The Effect of Giving Date Palm Juice to facilitate normal duration of the First Stage of Labor in the Control and Intervention Groups.**

**Table 4 Normality Test Effect of Giving Date Palm Juice to facilitate normal duration of the First Stage of Labor in the Control and Intervention Groups.**

| **Tests of Normality** | | | | | | |
|---|---|---|---|---|---|---|
| | **Kolmogorov-Smirnova** | | | **Shapiro-Wilk** | | |
| | Statistic | Df | Sig. | Statistic | Df | Sig. |
| Kel | .338 | 32 | .200 | .638 | 32 | .853 |
| a. Lilliefors Significance Correction | | | | | | |

The Kolmogorov-Smirnov test value obtained in the SPSS application, from

(a) Test the normality of data on the frequency of giving date juice to facilitate normal duration of the first stage of labor, the results of testing in the control group were found to be significant (p) 0,000> 0.05, so the data can be stated as normally distributed.

(b) Test the normality of data on the frequency of giving date juice to facilitate normal duration of the first stage of labor, the results of testing in the intervention group, the test results obtained a significant value (p) 0,000> 0.05 then the data can be declared normally distributed.

**e) Test the effect of homogeneity on giving palm date juice to facilitate normal duration of the first stage of labor.**

Before the hypothesis test is performed the homogeneity test is done using the Anova test. The results can be seen in table 5.

**Table 5 Test the effect of homogeneity on giving palm date juice to facilitate normal duration of the first stage of labor.**

| **ANOVA** | | | | | |
|---|---|---|---|---|---|
| **Results of Observation of the Smooth Delivery** | | | | | |
| | Sum of Squares | Df | Mean Square | F | Sig. |
| Between Groups | 4,500 | 1 | 4,500 | ,460 | ,503 |
| Within Groups | 293,500 | 30 | 9,783 | | |
| Total | 298,000 | 31 | | | |

The Anova Test value obtained in the SPSS application, the test results obtained a significant value (p) 0.503> 0.05, the data can be said to be homogeneous.

f) Independent T-test The effect of giving date juice to facilitate normal duration of the first stage of labor.

The results of the Independent T-test The effect of giving date juice to facilitate normal duration of the first stage of labor can be seen in the following table.

**Table 6 Independent T-test The Effects of giving palm juice to facilitate normal duration of the first stage of labor.**

| Variable | Mean | P = Value |
|---|---|---|
| Control Group | 10,483 | 0.000 |
| Intervention Group | 7.875 | 0.000 |

Based on the results of the Independent T-test test explains that the effect of giving date juice to facilitate normal duration of the first stage of labor in the control group and the intervention group has the same significant value (p-value) that is 0,000 <0.05.

## Discussion

The normal labor duration in mothers given Date juice is caused by it can affect the oxytocin receptors and accelerate the emergence of uterine contractions more easily to push the fetal head into the pelvic floor and shorten the duration of the latent phase of the first stage of labor[4]. From the research conducted there is a normal labor duration in primigravida and multigravida mothers.

Identification of the normal duration frequency of the first stage of labor from special data, it was found that the mother gave birth in the control group (who were not given date juice). For a duration scale in the first stage of labor in primipara experienced normal labor duration of 3 people (56%), while for multipara experienced normal labor duration of 6 people (56%). And for abnormal duration scale in the first stage of labor in primipara as many as 2 people (44%), while for multipara experiencing abnormal duration in labor as many as 5 people (44%).

Dates also contain hormones that help the uterus stretch for the birth of a baby. Dates affect the oxytocin receptors, stimulating the uterine muscles to respond more comfortably to oxytocin. Dates also affect the hormones progesterone and estrogen which are effective in preparing the uterus and cervical ripening[5].

Parity also affects the process of accelerating labor. Mothers with primipara parity status, of course, require a longer time in the labor process, so it is necessary to provide dates juice to stimulate the acceleration of labor[6]. However, due to time constraints and patient availability, most of the research respondents at Sele Be Solu Hospital were in the Multipara parity with a percentage of 78%. Regardless of parity status, every pregnant woman has a varying duration of labor, due to various factors, so it does not rule out the possibility of a pregnant woman with multipara parity status also requiring the provision of date palm juice to stimulate the delivery of labor and minimize risk[7-10].

The control group of mothers (who were not given date juice) experienced an abnormal duration of labor due to lack of uterine rate and systole (heart contraction when blood is pumped into the arteries). Maternal women need the hormone oxytocin during labor[11-13]. The hormone oxytocin is a hormone that is produced in the hypothalamus and is transported through the axoplasmic flow to the posterior pituitary which, if given the right stimulation, this hormone will be released into the blood. Based on the physiological effect of accelerating labor by stimulating contraction of the uterine smooth muscle, the hormone is named Oxytocin.

This study is consistent with previous research conducted by Sabrina Dwi Prihartini[14] in the Independent Practice of Midwives Mrs. Umi Salamah that there is an influence on giving of date palm juice to facilitate normal duration of of the first stage of labor. Another study conducted by Suroso Paryono in 2016 South Klaten Health Center with the title "The Effect of Consumption of Sari Palm Dates at the End of Pregnancy on the Progress of First Stage of Labor and the Number of Bleeding during Labor in Primipara in the Work Area of the South Klaten Health Center ", the result is that there is an effect on giving of date palm juice to facilitate normal duration of the first stage of labor.

## Conclusions

There is an effect on giving of date palm juice to facilitate normal duration of the first stage of labor in the Sele Be Solu District Hospital in Sorong City (P-Value 0,000 <0.05).

Suggestions for this research, pregnant women are advised to consider consuming palm juice for facilitating normal duration of the first stage of labor. For midwives, it is expected to provide counseling about the benefits of date palm juice on the normal duration of labor and should continue to be done following the patient's condition with a good approach before, because date palm juice does not affect the fetus or mother.

For researchers, to further deepen this study by trying to control several factors that can affect on giving of date palm juice to facilitate normal duration of labor and conduct laboratory tests so that the results obtained are more accurate, and prioritize pregnant women with primipara parity status as inclusion criteria.

**Ethical Clearance :** Obtained from university ethical committee

**Conflict of Interest :** Nil

**Source of Funding :** The Ministry of Health for the financial support for this research.

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# Food Management System and Satisfaction Level of Students of Pesantren Tebuireng Jombang, East Java

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## Abstract

Efforts so that a person's nutritional needs can be obtained optimally is by holding a food that is managed by applying various scientific disciplines. This study aims to analyze the food delivery system and the level of satisfaction of students in Tebuireng Islamic Boarding School in Jombang, East Java. This research was observational with a cross-sectional study design. Samples taken are students who live and or boarding at Tebuireng Islamic Boarding School in Jombang, East Java, with a total of 303 people from the class 2 population. Samples were taken using total sampling. Data collection is done by providing an identity questionnaire, satisfaction test form sheets and interviews with foodservice parties. The results showed that the food delivery system at Tebuireng Islamic Boarding School in Jombang in East Java was already good in management, service, and workflow but there were still shortages, such as the proportion of students and catering service staff that was not appropriate, there was no calculation of individual student needs, and food handlers hygiene knowledge still needs to be improved. The level of satisfaction of students to the overall menu of students with a thin nutritional status of 76.36% with the category "Satisfied"; students with normal nutritional status of 67.79% with the category "Dissatisfied"; and students with fat nutritional status of 64.49% with the category "Dissatisfied". Training regarding sanitation and hygiene is good and right during the process of providing food and training on how to process various kinds of menus from one food item.

***Keywords:*** *Food Management, Level of Satisfaction, Santri*

## Introduction

The nutritional and health status of mothers and children as a determinant of the quality of human resources is increasingly evident by the evidence that the nutritional and maternal health status in pre-pregnancy, during pregnancy, and during breastfeeding is a very critical period. The thousand-day period, which is 270 days during pregnancy and 730 days in the baby's first life, is sensitive because the effects on the baby at this time will be permanent and cannot be corrected. The impact is not only on physical growth but also on mental development and intelligence, which in adulthood can be seen from the physical size that is not optimal and the quality of work that is not competitive resulting in low economic productivity[1]

Inadequate nutrition can potentially inhibit sexual growth and maturation, although this may be the result of chronic malnutrition in infancy and childhood. And can place them at high risk of chronic diseases (risk of type 2 diabetes, hypertension, dyslipidemia, and carotid-arterial atherosclerosis) especially if combined with adverse lifestyle others. Deficiency or excess nutrients will be manifested in the form of growth that deviates from the standard pattern[2-4].

To maintain the quality of the food served, the food served must be evaluated one of the ways is to calculate the acceptability of consumer food. Food acceptance is the percentage of food consumed from the total amount provided[5-6]. This acceptance is influenced by several factors including the appearance of food when served and the taste of food. This study aims to analyze the food delivery system and the level of satisfaction of students in Tebuireng Islamic Boarding School in Jombang, East Java.

## Materials and Method

### Population and Sample

The population in this study is the food delivery unit in Tebuireng Islamic Boarding School in Jombang, East Java and all students in the Tebuireng Islamic Boarding School in Jombang, East Java. The students referred to in this study are students living and or boarding at Tebuireng Islamic Boarding School in Jombang, East Java. Sampling is done by total sampling from the target population. The target population is class II, junior high school, Islamic junior high schools, high school, and Islamic high school as many as 521 people. The sample used was a total sampling of 303 people.

### Data Collection

Data collection was obtained by conducting direct interviews with food service managers and respondents by referring to the questionnaire that was available that contained questions and statements to explore information about the variables to be analyzed which are closely related to the food delivery system and satisfaction.

### Data Analysis

Data analysis using IBM SPSS Statistics 21. Univariate analysis was carried out to get a general picture by describing each variable used in the study by looking at the description of the frequency distribution in tabular form. Bivariate analysis was performed using chi-square to see individual characteristics of the level of satisfaction.

## Results

The food management unit in the Islamic boarding school in the making of the menu does not see the habits of the students and employees (Table 1), menus are made based on a predetermined expenditure budget, for example like there is a fried chili sauce menu of tempeh not all students have the habit of consuming tofu and tempeh because of students not only from Jombang Regency but from various regions in Java and some even from outside Java.

**Table 1: Process Component Analysis at Tebuireng Islamic Boarding School in Jombang, East Java**

| No | Item | Yes | No |
|---|---|---|---|
| 1. | Budget Financing | ü | |
| 2. | Budget Planning | ü | |
| 3. | Santri factor (calculates the nutritional adequacy of students) | | ü |
| 4. | Eating habits (planned menus according to student eating habits, food habits) | | ü |
| 5. | Kitchen utensils and equipment available (if the equipment is limited to a simple planned menu) | ü | |
| 6. | Number of employees (1 employee for 8-10 students) | | ü |
| 7. | The amount of food received must be the same as the amount of food written on the purchase invoice and the same as the demand for the boarding school | ü | |
| 8. | The quality of food received must be by the specifications of the food requested at the time of purchase | ü | |

***Cont...*** **Table 1: Process Component Analysis at Tebuireng Islamic Boarding School in Jombang, East Java**

| | | | |
|---|---|---|---|
| 9. | The price of food items listed on the purchase invoice must be the same as the price of food items listed on the food supply offer. | ü | |
| 10. | Dry food container (rice, sugar, flour, green beans, oil, soy sauce, canned food, etc.) | ü | |
| 11. | Fresh food container (meat, poultry, vegetables, and fruit) | ü | |
| 12. | There is equipment needed (mechanical tools, containers of various sizes, cooking utensils including stoves, pans, pans, cutters in various sizes in good condition) | ü | |
| 13. | Recipe standards include the size of the food ingredients, seasonings needed, cooking methods and techniques for each type of cuisine. | ü | |
| 14. | Preparing spices (onion, garlic, ginger nutmeg, kaempferia galanga, coriander, cumin, pangi, galanga, lemongrass, chilies, and tomatoes) with mashed /ground, thinly sliced and crushed techniques. | ü | |
| 15. | Food that will be processed is fresh, not rotten and not withered | ü | |
| 16. | Using the right way of cooking food | | ü |
| 17. | The clothes used are brightly colored | ü | |
| 18. | Clothing that is used in a clean state | ü | |
| 19. | Hand nails are short and clean | | ü |
| 20. | Hand nails are not painted | ü | |
| 21. | Hands are always clean before touching food | ü | |
| 22. | Hair in a neat and bound condition (not unraveled) or covered | ü | |
| 23. | Food handlers use aprons that are still clean | ü | |
| 24. | Do not use aprons as hand towels | ü | |
| 25. | Food handlers use head cover to cover hair when processing food | | ü |
| 26. | Food handlers use food handlers when processing food ingredients | ü | |
| 27. | Food handlers use special gloves that are still clean when processing food | | ü |

| | | | |
|---|---|---|---|
| 28. | Washing hands with clean water and soap each time will handle food | ü | |
| 29. | Cover your mouth and nose with a handkerchief or special cloth when sneezing or coughing | ü | |
| 30. | Do not pry ears and or nose at work | | ü |
| 31. | Do not hold dirty objects when working | ü | |
| 32. | Do not smoke while working | ü | |
| 33. | The water used does not smell | ü | |
| 34. | The water used is colorless and tasteless | ü | |
| 35. | The water used for washing food utensils is running water | ü | |
| 36. | There is a toilet with a door that is always closed and in a clean state complete with soap | ü | |
| 37. | Available bins in sufficient quantities and meet the requirements, namely at least 1 trash can in each production room, waterproof, has a lid and always cleaned every day | ü | |
| 38. | There is a sewerage that is smooth and waterproof. | ü | |

Based on the results of the menu analysis using CD Menu software, the most energy is found in the 4th-day menu with the amount of energy of 2597.8 kcal and the least energy is the menu on the 3rd day which is 2111.3 kcal.

**Table 2. Analysis of Output Components (Nutrition Value Menu) at Tebuireng Islamic Boarding School in Jombang, East Java**

| **Menu Days to** | **Nutritional Substances** | | | |
|---|---|---|---|---|
| | **Energy (kcal)** | **Protein (gr)** | **Fat (gr)** | **Carbohydrate (gr)** |
| 1 | 2348 | 78,1 | 61,3 | 371,9 |
| 2 | 2412,6 | 101,4 | 56,4 | 371,1 |
| 3 | 2111,3 | 78,5 | 43,5 | 341,7 |
| 4 | 2597,8 | 93,8 | 61,4 | 421,4 |
| 5 | 2531,9 | 102,6 | 57,9 | 395,7 |
| 6 | 2458,2 | 97,0 | 60,0 | 384,4 |
| 7 | 2566,6 | 99,2 | 52,3 | 263,4 |
| 8 | 2226,7 | 69,1 | 39,2 | 393,8 |

**Table 3. Frequency of Santri Characteristics in Tebuireng Islamic Boarding School in Jombang, East Java**

| Characteristics | Nutritional Status | | | | | |
|---|---|---|---|---|---|---|
| | Thin | | Normal | | Fat | |
| | n | % | n | % | n | % |
| Age | | | | | | |
| 12 – 15 year | 10 | 71.4 | 95 | 39.3 | 22 | 46.8 |
| 16 – 18 year | 4 | 28.6 | 147 | 60.7 | 25 | 53.2 |
| Total | 14 | 100 | 242 | 100 | 47 | 100 |
| Gender | | | | | | |
| Man | 11 | 78.6 | 147 | 60.7 | 22 | 46.8 |
| Girl | 3 | 21.4 | 95 | 39.3 | 25 | 53.2 |
| Total | 14 | 100 | 242 | 100 | 47 | 100 |
| Origin | | | | | | |
| Bali | 0 | 0.0 | 3 | 1.2 | 1 | 2.1 |
| Banten | 0 | 0.0 | 8 | 3.3 | 1 | 2.1 |
| Bengkulu | 0 | 0.0 | 1 | 0.4 | 0 | 0.0 |
| DKI Jakarta | 0 | 0.0 | 15 | 6.2 | 1 | 2.1 |
| Jabar | 2 | 14.3 | 21 | 8.7 | 10 | 21.3 |
| Jambi | 0 | 0.0 | 2 | 0.8 | 0 | 0.0 |
| Jateng | 1 | 7.1 | 31 | 12.8 | 7 | 14.9 |
| Jatim | 10 | 71.5 | 138 | 57.0 | 25 | 53.2 |
| Jogyakarta | 0 | 0.0 | 3 | 1.2 | 0 | 0.0 |
| Kalteng | 0 | 0.0 | 1 | 0.4 | 0 | 0.0 |
| Kaltim | 0 | 0.0 | 2 | 0.8 | 1 | 2.1 |
| Kalut | 0 | 0.0 | 1 | 0.4 | 0 | 0.0 |
| Kepri | 0 | 0.0 | 1 | 0.4 | 0 | 0.0 |
| Lampung | 1 | 7.1 | 3 | 1.2 | 0 | 0.0 |
| Malut | 0 | 0.0 | 1 | 0.4 | 0 | 0.0 |
| NTT | 0 | 0.0 | 1 | 0.4 | 0 | 0.0 |
| Papbar | 0 | 0.0 | 1 | 0.4 | 0 | 0.0 |
| Papua | 0 | 0.0 | 1 | 0.4 | 0 | 0.0 |
| Riau | 0 | 0.0 | 1 | 0.4 | 0 | 0.0 |
| Sulsel | 0 | 0.0 | 2 | 0.8 | 0 | 0.0 |
| Sulteng | 0 | 0.0 | 2 | 0.8 | 0 | 0.0 |
| Sumsel | 0 | 0.0 | 3 | 1.2 | 1 | 2.1 |
| Total | 14 | 100 | 242 | 100 | 47 | 100 |

Based on table 3, the respondents who were mostly aged between 12-15 years were in the normal nutritional status of 74.8%; most respondents aged between 16-18 years were at normal nutritional status that is 83.5%.

**Table 4. Distribution of Santri Satisfaction of the Entire Menu at Tebuireng Islamic Boarding School in Jombang, East Java**

| **Overall Quality Food Menu** | **Nutritional Status** | | |
|---|---|---|---|
| | Thin | Normal | Fat |
| Score (%) | 76,36 | 67,79 | 64,49 |
| Category | Satisfied | Not Satisfied | Not Satisfied |

Table 4 shows the level of satisfaction of students with the overall menu of students with nutritional status of 76.36% under the category of "Satisfied"; students with normal nutritional status of 67.79% with the category "Dissatisfied"; and students with fat nutritional status of 64.49% with the category "Dissatisfied".

## Discussion

Employees also need to get adequate nutrition attention so that employee performance is expected to be optimal. According to Marotz[7], nutritional needs are several nutrients needed by individuals to be able to live healthy and maintain their body condition. Adequacy of nutrition is the amount of each nutrient needed by individuals to live a healthy life. The nutritional adequacy of each person/individual varies according to age, sex, and level of activity.

According to Nurdiani[8], in the procurement of foodstuffs, there is a food procurement planning and market survey aimed at obtaining standardized foodstuff specifications according to size, type, size to maintain good quality foodstuffs. The market survey aims to find out the price of materials by specifications in the market as a basis for budget planning.

According to Kwon et al[9], the reception of foodstuffs in the operation of food is carried out to ensure that food is received in a fresh and safe condition so that foodstuffs can be moved to the right place by the characteristics of these foodstuffs. It is known that the food operation unit already has a dry food storage area and has been separated between dry food ingredients and wet or fresh food items. This is by the statement of Bartono & Ruffino[10], which states that the food ingredients are stored according to the appropriate types and conditions.

In preparing food ingredients must pay attention to the principle of maintaining and preventing loss of nutrients lost cooked, weeding, and washing food ingredients then cut them according to recipe instructions, carry out preparation techniques and mix herbs according to recipe instructions, prepare food ingredients and seasonings as little as possible with cooking.

In food processing, hygiene behavior is very much needed, including using the attributes of the headcover, mask, and gloves to avoid contamination of food. According to Damayanthi et al[11], high levels of bacterial and microbial contamination of cutlery and food served openly. Therefore it is necessary to increase hygiene behavior for food handlers. One way to do hygienic behavior for food handlers is to wash hands before doing food processing activities. But food handlers must know good hygiene behavior. This is due to avoid contamination of food[12].

Based on the results of menu analysis using CD Menu software, it is obtained the nutritional value of the menu per day in the menu cycle. The menu with the most energy is on the 4th-day menu with the amount of energy of 2597.8 kcal, while the least energy is the menu on the 3rd day which is 2111.3 kcal. Research conducted by Carrier[13] proves that menu cycles, modification of recipes, serving and packaging as well as ways of food distribution are significantly related to the incidence of malnutrition because it reduces food intake

Customer satisfaction can be achieved if consumers feel all their needs are met and get good customer service. The results of this study are also consistent with the results of Mandasari & Tama's[14] research, which states that staff behavior including service friendliness is the most influential attribute on customer satisfaction.

African American adolescents have low consumption of vegetables and fruits, and they consume too much fried food and soft drinks: 55.1% consume twice or more fried foods every day and 19.5% four times or more daily day; 70.3% consumed soft drinks twice or more every day and 22.0% four times or more every day on average[15.]

## Conclusions

The food delivery system at Tebuireng Islamic Boarding School in Jombang in East Java is good in management but the knowledge of food handlers' hygiene needs to be improved. In organizing food, it should consider aspects that can improve consumer appetite, namely variations in processing techniques, taste, flavor, color, size, shape of the dish cut, portions, and appearance of the presentation and training on how to process various kinds of menus from one food ingredient.

**Ethical Cleanrence**: from university ethical committee

**Source of Funding :** This publication was supported by the Health Polytechnic Ministry of Health, Sorong, Indonesia.

**Conlict of Interest** : Nil

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# Macronutrient Intake of 6-11 Months Old Infant on Mothers Obtaining Moringa Leaves and Iron Supplements

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## Abstract

The study aimed to investigate the 6-11 months old infants' macronutrients intake on mothers obtaining moringa leaves and iron supplements.

**Method:**This experimental study complemented by kohort study was done in Jeneponto District in 2018 in which the samples were 6-11 months old infant. The research subject was 308 pregnant mothers categorized into 3 groups consisting of group which obtained moringa leaves powder (MLP, n= 103), group which obtained moringa leaves extract (MLE, n=94) and group which obtained irons/folate (IFA, n=111). The data obtained were then analyzed using one way Anova and Kruskall Wallis to test the difference.

**Results:** The research found that different carbohydrate intake was found to be in the $10^{th}$ and $11^{th}$ month, while in the 7th, 8th and 9th month, there was no different carbohydrate intake between the three intervention groups ($p>0.005$). Furthermore, based on the statistical test, different protein intake ($p <0.05$) was also found in $10^{th}$ and $11^{th}$ month, while in $7^{th}$, $8^{th}$ and $9^{th}$, there was no different protein intake between the three groups($\rho>0.05$). Meanwhile, regarding the fat intake, there was no difference in such between the three intervention groups in 7 to $10^{th}$ month ($\rho<0.05$), while in the $11^{th}$ group, there was different fat intake ($\rho>0.05$).

**Conclusion***:* Different carbohydrate and protein intake was found in the 10th and 11th month, while different fat intake was found in the 11th month only between the three intervention groups. As they get older, there was increased macronutrient intake on MLP and MLE groups, however such thing does not happen in IFA group since there was decreased intake in the 11th month which did not meet the need. Thus, it is suggested that future researcher will give supplement intervention on 6-11 months old baby.

***Keywords*** *:Intake, Macronutrient, Baby, Moringa Leaves, Iron*

## Introduction

Complementary food is solid and semi-solid food containing nutrition and energy accompanying breast milk or formula milk to be given to infant which usually introduced to the baby at the range of 4-6 months old[1]. Optimal complementary food is one of the components to improve infants' nutritional status and health in their first 1000 days starting during the pregnancy until the second year of the infant[2–4].Malnutrition causes the mortality of 3.1 million children annually[5], thus baby and infant food directly determines the nutritional status of childre.

The high malnutrition during childhood is caused by inadequate food intake. There was only 55% of less than 6 months old infant who were breastfeed exclusively and only 7% of 6-8 months old infant who were feed as recommended by WHO. This indicates that there was high stunting prevalence at the age of 3 months old. High quality diet starting from the age of 6 months should be done in order to decrease the stunting rate at the second year[6].

Decreased prevalence occurred during solid, semi-solid and soft food feeding between the educated mothers on 6-8 months old infant (67% in 2003 into 57% in 2013); minimal food diversity (33% in 2003 into 24% in 2013) and minimum acceptable diet (13% in 2003 into 8% in 2013)[7].

Infants at the age of 6-12 months old have lower decreased stunting rate than children at the age of 36-47 months old[8]. A research project that was performed in India found that stunting was mostly found in 36-47 months old children than 48-59 months old children. This is due to the bad weaning and complementary feeding which contribute to the children's energy and protein intake inadequately.

High protein complementary food is related linearly to the growth and body weight of the infants who are kept breastfeed but does not add the adiposity[1]. Circadian distribution of energy consumption can affect the adipose tissue and body weight of 12 months old infant. Bigger adipose tissue increases overweight risk on children who were feed at night more than during the day[9,10]

Malnutrition on 6-8 months old infant is indicated by the lack of iron, zinc, and niacin, while malnutrition on 9-11 months old infant in indicated by inadequate complementary food so that it is suggested to add meat, fish, chicken and egg (MFPE) on the infants' complementary food[11]. The objective of this research is to investigate the difference in 6-11 months old infants' macronutrient intake on mothers obtaining moringa leaves and irons supplements.

## Materials and Method

Experimental research continued by cohort study was done by choosing 6-11 months old infants as the sample. This research was done in Jeneponto District in 2018 collecting 308 pregnant mothers as the research subject. The subjects were then grouped into three consisting of mothers who obtained moringa leaves powder (MLP, n=103), mothers who obtained moringa leaves extract (MLE, n=94) and mothers who obtained irons/folate (IFA, n =111). The inclusion criteria to choose the pregnant mothers were those who were at the second trimester and one month after giving birth, have given birth for ≤3 times, have single fetus, willing to consume capsule for 4 months and did not consume other multivitamin and mineral during the research. The research variable was breastfeeding on 6-11 months old infant. The mothers and children characteristics were found using questionnaire and analyzed using one wayAnova and Kruskall Walli. This research has obtained approval from the Ethical Committee of the Faculty of Medicine of Universitas Hasanuddin number 1071909130.

## Results

**Table 1. Distribution Based on Parents' Characteristics**

| Variable | MLP (n=103) | | MLE (n= 94) | | IFA (n=111) | | TOTAL (N=308) | | ρ value |
|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | |
| Mothers' Age | | | | | | | | | |
| <26 years old | 36 | 35.0 | 33 | 35.1 | 39 | 35.1 | 108 | 35.1 | 1.000 |
| >=26 years old | 67 | 65.0 | 61 | 64.9 | 72 | 64.9 | 200 | 64.9 | |
| Mothers' Education | | | | | | | | | |
| Low (< 12 years) | 70 | 68.0 | 64 | 68.1 | 75 | 67.6 | 209 | 67.9 | 0.996 |
| High (>= 12 years) | 33 | 32.0 | 30 | 31.9 | 36 | 32.4 | 99 | 32.1 | |

***Cont..*** **Table 1. Distribution Based on Parents' Characteristics**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Mothers' Occupation | | | | | | | | | |
| Do not work | 81 | 78.6 | 80 | 85.1 | 89 | 85.1 | 250 | 81.2 | 0.483 |
| Work | 2 | 21.4 | 14 | 14.9 | 22 | 14.9 | 58 | 18.5 | |
| Fathers' Education | | | | | | | | | |
| Low (< 12 years) | 67 | 65.0 | 64 | 68.1 | 70 | 63.1 | 201 | 65.3 | 0.752 |
| High (>= 12 years) | 36 | 35.0 | 30 | 31.9 | 41 | 36.9 | 107 | 34.7 | |
| Fathers' Occupation | | | | | | | | | |
| Farmer/fisher | 44 | 42.7 | 40 | 42.6 | 48 | 43.2 | 132 | 42.9 | |
| Civil Servant/Private Employees | 11 | 10.7 | 16 | 17.0 | 19 | 17.1 | 46 | 14.9 | |
| Driver/Daily Laborer | 32 | 31.1 | 21 | 22.3 | 23 | 20/7 | 76 | 24.7 | 0.600 |
| Entrepreneur | 12 | 11.7 | 14 | 14.9 | 19 | 17.1 | 45 | 14.6 | |
| Others | 4 | 3.9 | 3 | 3.2 | 2 | 1.8 | 9 | 2.9 | |
| Income | | | | | | | | | |
| <2 million | 79 | 76.7 | 64 | 68.1 | 78 | 70.3 | 221 | 71.8 | 0.370 |
| ≥ 2 million | 24 | 23.3 | 30 | 31.9 | 33 | 29.7 | 87 | 28.2 | |

Fathers, most of them have low education as well by 201 fathers (65.3%), mostly worked as farmer/fisher by 132 fathers (42.9%), and most of them have income of less than 2 million by 221 fathers (71.8%)

**Table 2. Distribution Based on the Infants' Characteristics**

| **Variable** | **MLP (n=103)** | | **MLE (n= 94)** | | **IFA (n=111)** | | **TOTAL (N=308)** | | **p-value** |
|---|---|---|---|---|---|---|---|---|---|
| | **n** | **%** | **n** | **%** | **N** | **%** | **n** | **%** | |
| Gender | | | | | | | | | |
| Male | 60 | 58.3 | 47 | 50.0 | 60 | 54.1 | 167 | 54.2 | 0.509 |
| Female | 43 | 41.7 | 47 | 50.0 | 51 | 45.9 | 141 | 45.8 | |
| Birth Weight | | | | | | | | | |
| Low | 1 | 1.0 | 3 | 3.2 | 9 | 8.1 | 13 | 4.2 | 0.029 |
| Normal | 102 | 99.0 | 91 | 96.8 | 102 | 91.9 | 295 | 95.8 | |
| Birth Length | | | | | | | | | |
| >= 48 cm | 94 | 91.3 | 81 | 86.2 | 89 | 80.2 | 264 | 85.7 | 0.068 |
| <48 cm | 9 | 8.7 | 13 | 13.8 | 22 | 19.8 | 44 | 14.3 | |
| Breastfeed | | | | | | | | | |
| Yes | 82 | 79.6 | 77 | 81.9 | 91 | 82.0 | 250 | 81.2 | 0.884 |
| No | 21 | 20.4 | 17 | 18.1 | 20 | 18.0 | 58 | 18.8 | |
| Complementary Food | | | | | | | | | 0.498 |
| <6 months | 24 | 23.3 | 27 | 28.7 | 24 | 21.6 | 76 | 24.7 | |
| >=6 months | 79 | 76.7 | 67 | 71.3 | 87 | 78.4 | 232 | 75.3 | |
| Parity | | | | | | | | | |
| 1 | 28 | 27.2 | 28 | 29.8 | 40 | 36.0 | 96 | 31.2 | 0.355 |
| >1 | 75 | 72.8 | 66 | 70.2 | 71 | 64.0 | 212 | 68.8 | |

Table 2 above gives information that most of the infants were male by 167 infants (54.2%), their birth weight was mostly 295 infants(95.8%), while the birth length was mostly ≥ 48 cm by 264 infants (85.7%). Most of them were still breastfeed by 250 infants (81.2%), given complementary food during ≥ 6 months old by 232 (75.3%), and most parity was> 1 which is by 212 infants (68.8%).

**Macronutrient Intake**

**Table3. Mean Carbohydrate Intake for Infant on the Three Intervention Groups**

| Carbohydrate (gram) | Mean Intake | | | ρ-value |
|---|---|---|---|---|
| | MLP | MLE | IFA | |
| 7th month | 28.519±27.83 | 28.17±21.68 | 25.87±21.91 | 0.600 b |
| 8th month | 30.27±23.09 | 38.96±24.48 | 32.79±22.54 | 0.113 a |
| 9th month | 38.90±28.99 | 45.32±24.27 | 40.63±26.91 | 0.434 a |
| 10th month | 35.31±22.27 | 49.12±20.37 | 45.28±25.01 | 0.002 b |
| 11th month | 40.65±25.21 | 57.02±27.00 | 43.56±24.48 | 0.001 b |

It shows that between the three intervention groups, there was no different carbohydrate intake on the 7$^{th}$, 8$^{th}$, and 9$^{th}$ month (ρ>0.05), while on the 10$^{th}$ and 11$^{th}$ month, there was different carbohydrate intake(ρ<0.05). On MLP and MLE groups, as the infants got older, the carbohydrate intake also increased but not IFA group since there was decreased intake on the 11$^{th}$ month.

**Table4. Mean Protein Intake for Infant on the Three Intervention Groups**

| Protein (gram) | Mean Intake | | | ρ-value |
|---|---|---|---|---|
| | MLP | MLE | IFA | |
| 7th month | 5.38±5.90 | 5.37±4.41 | 4.80±3.85 | 0.354 b |
| 8th month | 5.34±3.44 | 6.63±5.00 | 6.27±4.20 | 0.387 b |
| 9th month | 6.94±4.99 | 7.32±4.13 | 6.83±3.91 | 0.621 b |
| 10th month | 7.94±5.65 | 9.81±4.88 | 9.39±5.29 | 0.026 b |
| 11th month | 7.61±5.03 | 12.61±7.74 | 8.37±5.87 | 0.000 a |

Table 4 presents the result of statistical result showing that among the three groups, there was no different protein intake on the 7$^{th}$, 8$^{th}$, and 9$^{th}$ month (ρ>0.05), while on the 10$^{th}$ and 11$^{th}$ month, there was different protein intake (ρ<0.05). On MLP and MLE groups, as the infants got older, the protein intake also increased but not on the IFA group since there was decreased intake on the 11$^{th}$ month.

**Table5. Mean Fat Intake for Infant on the Three Intervention Groups**

| Fat (gram) | Mean Intake | | | ρ-value |
|---|---|---|---|---|
| | MLP | MLE | IFA | |
| 7th month | 4.20±7.63 | 4.31±5.62 | 3.48±4.22 | 0.491 [b] |
| 8th month | 4.37±6.53 | 5.04±6.20 | 4.62±4.64 | 0.401 [b] |
| 9th month | 5.39±7.27 | 5.38±6.12 | 4.80±5.35 | 0.917 [b] |
| 10th month | 6.29±6.27 | 7.34±5.59 | 6.88±6.19 | 0.298 [b] |
| 11th month | 5.55±4.87 | 8.84±6.66 | 6.23±6.36 | 0.004 [a] |

Table5 shows that fat intake on the 7th, 8th, 9thand 10th month were not different among the three intervention groups (ρ<0.05), while on the 11th month, there was different fat intake between the groups (ρ>0.05). On MLP and MLE groups, as the infants got older, the fat intake also increased but not on the IFA group since there was decreased intake on the 11th month.

## Discussion

Among the three groups studied, the carbohydrate intake by the infants were not different significantly on the 7th, 8th and 9th month, but it showed significant difference on the 10th and 11th month. On MLP and MLE groups, as the infants got older, the carbohydrate intake also increased but not on the IFA group since there was decreased intake on the 11th month, and the amount of intake on MLE group was more than the other two intervention groups. However, the amount has not reached the standard of 7-11 months old infants' need which is 82 g/h without breast milk. Meanwhile, if it was complementing breast milk of 7.0 g/h added by the highest content in the research which is 57.02 g/h.

Protein is an important nutrient composition of complementary food. It is the main source of amino acid. Adequate protein food intake is very important in protecting the cell function and integrity to ensure normal health and growth. Furthermore, the lack of protein and low energy intake can cause malnutrition of protein-energy (PE) which is the most common malnutrition form in the world[12]

Regarding the protein intake, there was no significant difference found either on the 7th, 8th and 9th month, instead it was found on the 10th and 11th month. Infants' protein need increases as they get older proven by the research result that on MLP and MLE groups but not on IFA group due to decreased intake on the 11th month.

The amount of protein (gram/day) needed to adequate the infants' nutrition need both from the breast milk and complementary food is 9.1 g for 6-8 months old infant, 9.6 g for 9-11 months old[13] and 18 g/h according to Regulation of Ministry of Health. Breast milk provides significant protein need for the infant. If the average breast milk assumed, then the amount of protein needed from the complementary food is 1.9 g/day on 6-8 months old (21%), 4.0 g/day on 9-11 months old (42%), and 6.2 g/day (57%) on 12-23 months old[14]. Based on this research, the amount of protein intake consumed by the infants other than the breast milk protein on the three intervention groups at the age of 7-8 and 9-11 months old was ≥ 4.8 g/dayand ≥ 6.8 g/day which means that the protein intake was above the standard suggested.

Fat provides essential fat acid, facilitates the absorbance of vitamin dissolved in fat as well as improves energy solid food pattern and sensory quality thus it is important for the infant and children diet. Breast milk is usually has more fat than the complementary food. Therefore, total fat intake usually decreases as the older of breast milk contribution on the decrease of total food

energy.

Among the three intervention groups, there was no significant difference found in fat intake during the 7th, 8th, 9th and 10th month. However, there was significant difference on the 11th month. On MLP and MLE groups, the amount of infants' fat intake increases as the infants got older, but it did not happen on IFA group and the amount of intake on MLE group is more than the other two intervention groups. However, the amount is way below the standard and such thing does not affect some infants due to the breastfeeding.

Even though there is debate regarding the optimal amount of fat in infants and children food, the range of 30-45% of total energy is suggested[15]. The percentage of energy from the fat in complementary food needed to reach 30-45% energy from fat in total diet depends on the breast milk intake and fat level of breast (15). Infants in developing countries usually consume breast milk with normal fat concentration (38 g/L). When developing the diet guideline to provide adequate fat for complementary food, the potential effect of the fat added needs to be considered (such as oil added by porridge) on the nutrition of the food. For example, the addition of one teaspoon of vegetable oil to 100 g typical corn peppers used in West Africa can increase the energy density from 0.28 to 0.73 kkal/g, but it will decrease the protein density from 8.9% to 3.3% from the energy and irons density from 0.5 to 0.2 mg/100 kkal.

## Conclusion

Different carbohydrate and protein intake was found in the 10th and 11th month, while different fat intake was found in the 11th month only between the three intervention groups. On MLP and MLE groups, the older they get, the more increase the macronutrient intake. However, it does not happen on IFA group because there was decreased intake on the 11th month but it did not adequately fulfill the need so the future researcher needs to give supplement intervention on 6-11 months old infants.

**Source of Funding:** This study was sponsored by Ministry of research and higher education

**Ethical Clearance:** Obtained from Hasanuddin University ethical committee

Conflict of Interest : None

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# The Effect of *Moringa Oleifera* on the Life Outcome of Pregnant and Breastfreeding Mothers: Literature Review

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## Abstract

**Background:** As an extraordinary plant, moringa oleifera is nutritios plant which is also a source of medicine having content different from other common plants. Moringa also contains all elements of essential amino acids. Moringa is believed to have potential to decrease malnutrition, hunger, increase breast milk volume as well as prevent and heal various diseases due to its nutritious content. **Objective:** This literature study aims to obtain input regarding the effect of *moringa oleifera* on the life outcome of the pregnant and breastfeeding mothers in Indonesia. **Method:** The literature review was conducted through Google scholar and electronic database of PubMed, Clinical Key and Springer. The keywords of Moringa oleifera, pregnancy, galactogogue, breastfeeding, nutrition, health and diseases were used to search original research or literature review on both open access English national and international journal. As many as 24 articles published in 2009 to 2019 were reviewed and synthesized using unsystematic narrative review, obtaining suitable 26 articles and unsuitable 14 articles. **Results:** This research found that moringa oleifera is good for pregnant and breast feeding mothers. **Conclusion:** As one of alternative plants, *Moringa oleifera* is believed to have potential in decreasing malnutrition, hunger, preventing BBLR, increasing breast milk volume and quality, increasing HB level and preventing anaemia which commonly happens among the pregnant mothers.

***Keywords:*** *Moringa oleifera, pregnant mothers, breastfeeding mothers*

## Introduction

Children's growth and development is significantly determined during the pregnancy period which is a critical phase. Nutrition is really important during the pregnancy period as it supports the fetus growth and development. Study proved that mothers with poor nutrition status causes disturbed fetus growth, gives birth to baby with low birth weight and causes malnutrition between generations[1]

Giving exclusive breastfeeding for 6 months is one form to improve nutrition in infant, Education lactation can improve knowledge, attitudes and behavior of mother to give breastfeeding up to 6 months, several determinant factors of exclusive breastfeeding in 0-6 months infants were giving colostrum, mother's work, family income, mother's education, and mother's knowledge about the benefits of exclusive breastfeeding. Iron deficiency in early life can cause brain development disorders and other developmental effects. Iron is very important for brain development, anemia causes metabolic energy deficiency and memory function[2-4].

Nutrition has primary role in mothers' and children's health. Poor mothers' nutritional status is related to adverse birth effect. However, there is complex relationship between the mothers' nutrition and the effect of the birth since it is affected by many biological, socio-economical and demographical factors in different population. Nutrition intervention is a way to improve the birth and quality of life as well as decrease the mortality, pain and health from understanding the correlation between mothers' nutrition and effect of birth. The intervention can be developed through understanding the correlation between mothers' nutrition and the effect of birth[1].

*Moringa leaves* also contains all elements of essential amino acids. These various nutrition is an extraordinary source from plant. Meanwhile six tablespoons of *Moringa leaves* powder can met the daily needs of calcium and iron of pregnant and breastfeeding mothers, can reduce the incidence of morbidity in infants 0-5 months in the district[5-8]. This research aimed to perform literature review in order to obtain input regarding the effect of *Moringa oleifera* on the life outcome of pregnant and breastfeeding mothers in Indonesia.

## Materials and Method

The design of this research was qualitative research through literature review. This research was conducted in Desember 2019 on various research results. This literature review was done through Google scholar, and electronic database of PubMed, Clinical Key and Springer with keywords of *Moringa oleifera*, pregnancy, *galactogogue*, breastfeeding, nutrition, health and diseases to find out the original research or the review of literature review on both open access English national and international journal. As many as 24 articles were reviewed and synthesized using unsystematic narrative review, obtaining suitable 26 articles and unsuitable 14 articles.

**Table 1. Document eligibility criteria**

| CRITERIA | ACTION | DESCRIPTOR |
|---|---|---|
| Publication date | Inclusion | 2009-2019 |
| Region | Inclusion | Indonesia |
| | | India |
| | | Bangladesh |
| | | Nigeria |
| Setting intervention | Inclusion | Pregnant mothers<br>Breastfeeding mothers |
| | Exclusion | Experimental animal |
| Language | Inclusion | Bahasa Indonesia |
| | | English |

## Results

**Literature review result can be seen on Table 2**

**Table 2. Comparison of moringa oleifera for each literature**

| No | Authors | Intervention Setting | Study Design | Tool type | Report outcome |
|---|---|---|---|---|---|
| 1 | (9) | Pregnant mothers | Randomized, double-blind, controlled trials | Questionnaire, intervention | The provision of Moringa leaves extract to pregnant mother who were also informal workers can decrease the stress and improve the nutritional status but cannot decrease the DNA damage. |
| 2 | (10) | Breastfeeding mothers | literature explained | Literature | Moringa oleifera can prevent anemia on pregnant mothers. Study on moringa extract proved that government and community should utilize this local food to prevent anemia and harmful pregnancy |
| 3 | (11) | Pregnant mothers | Randomized Double Blind, Posttest controlled | Questionnaire, intervention | Provision of Moringa leaves extract to prevent anemia and DNA damage due to oxidative stress on pregnant mothers, as well as prevent BBLR |
| 4 | (12) | Pregnant mothers | double blind, randomized control trial study, pretest-posttest controlled | Questionnaire, intervention | Moringa oleifera leaves extract significantly increase the hemoglobin level on pregnant, prevent ferritin serum to decrease up to 50%. Further research needs to be conducted to ensure the validity of Moringa leaves extract dose. |
| 5 | (13) | Pregnant and breastfeeding mothers | Comprehensive study | Questionnaire, intervention | Moringa oleifera leaves powder can increase mothers' Hb level, but cannot increase the mothers' weight |
| 6 | (5) | Pregnant mothers | Quasi experimental research of one group pretest - posttest design | Questionnaire, intervention | Moringa leaves powder can increase pregnant mothers' Hb level who has anemia |
| 7 | (14) | Pregnant mothers | Randomized, double-blind, placebo-controlled study | Questionnaire, intervention | Moringa leaves extract can increase iron deficiency anemia on women |
| 8 | (15) | Breastfeeding mothers | randomized controlled double-blind design | Questionnaire, intervention | The provision of Moringa extract and flour can improve breast milk volume in which the improvement of breast milk was higher on group who obtained Moringa leaves extract compared to the group who obtain moringa leaves flour. However, it did not affect the quality of breast milk (iron, vitamin C and vitamin E) |
| 9 | (16) | Pregnant and breastfeeding mothers | non-randomized group pre-post test | Questionnaire, intervention | Provision of honey and Moringa leaves extract on pregnant mothers who were passive smoker can decrease oxidative stress and DNA damage and prevent low birth weight. |

After reviewing the 14 articles, it was known that among the articles, several of them commonly explains that *Moringa oleifera* is able to increase Hb level on pregnant mothers while the other several articles explain the other benefits of *Moringa oleifera* for having potential to decrease malnutrition, hunger, prevent DNA damage due to stress on pregnant mothers, prevent the occurrence of anemia on pregnant mothers, prevent low birth weight and increase the breast milk volume. However, one of the articles explain the consuming *Moringa oleifera* cannot increase the weight of pregnant mothers and does not affect the breast milk quality.

## Discussion

1. Moringa oleifera

*Moringa oleifera* Lam (synonym: *Moringa pterygosperma* Gaertner) or commonly known as *kelor* is the most popular species of Moringacae genus species. *Moringa oleifera* grows in the form of three and has long live (*perenial*) with height of 7-12 meters. It has woody stems (lignosus), upright, and having thin skin, dirty white colour and rough surface. It also has simpodial branching directing uprightly or tilted and tend to grow in line and extendedly. It can grow both in lowland and highland up to height of ± 1000 m above the sea level, planted frequently as boundary or fence on house yard or field[22].

Fuglie LJ 1999 conducted research resulting that *Moringa* leaves actually contain vitamin A, vitamin C, Vitamin B, calcium, potassium, iron and protein in high amount which is easily consumed and assimilated by human body. In addition, *Moringa* also known to contain more than 40 anti-oxidant[22].

### *2. Moringa Oleifera* Can Increase Breast Milk

Breastfeeding mothers need nutrition more than during her pregnancy. During breastfeeding, she needs extra energy to heal her health condition after giving birth, daily activities such as forming the breast milk. In the first month after giving birth, ASI production is commonly abundant so that it comes out a lot and sucked by the baby, thus the mothers will become hungry and thirsty faster. In order that the amount of calories is balanced with the needs, then adequate nutrition is also needed because the energy will be reprocessed for forming the breast milk. During breastfeeding, mothers produce about 800-1000cc of breast milk[23].

Research on herbs or food which can increase the breast milk production has not been done numerously. Previous research often used animal as the research subject. However, several food and herbs have long been believed to be able to increase the breast milk production. *Moringa* leaves increases the lactation effect proven by higher increase on mothers' serum prolactin level. Prolactin is the most important hormone in lactation initiation. *Galactagogues* is a concoction to increase the volume of breast milk and making the milk flow smoothly. *Moringa* leaves powder is effective *galactagogues* to increase the volume of breast milk and accelerate it [22,24-26].

### The effect of *Moringa oleifera* provision on pregnant mothers

Pregnant period is critical phase determining the children's growth and development. Good pregnant outcome is really expected so that it will creates healthy, smart and productive human resource. Research in India proves that mother with malnutrition status causes disruption on fetus growth and cause the mother to give birth to baby with low birth weight[25,26].

*Moringa oleifera* has long been used to overcome the malnutrition issue on children, pregnant mothers and breastfeeding mothers. Furthermore, micro nutritional compound in *moringa* leaves can be used as alternative supplement for pregnant mothers to prevent anaemia and low birth weight. The prevention of anaemia on mothers can decrease the occurrence of complication during the pregnancy and body weight[6] .

### 3. The effect of *Moringa oleifera* provision on breastfeeding mothers

Breast milk also contains protection compound that can prevent the baby from infectious disease. Providing breast milk also gives extraordinary emotional effect which can affect the inner connection between the mothers and the baby, as well as affect the psychological development of the baby. The provision of exclusive breast milk can optimize the growth of the baby. Factors affecting the provision of breast milk are the mothers who are supported well by the family and lactation education which can increase the mothers' knowledge, attitude and behavior to give exclusive breast milk until 6 months[3,26-29].

**Previous research done by Zakaria in 2016 in Maros District on 70 breastfeeding mothers 6 weeks after giving birth shows that the provision of *Moringa* leaves extract and powder can increase the breast milk volume, however, the increase on group obtaining the extract was higher that the group obtaining the powder, but it did not affect the breast milk quality (iron, vitamin C and vitamin E)[15].**

## Conclusion

*Moringa oleifera* is one of alternative plants believed to have potential to decrease malnutrition, hunger, prevent low birth weight, increase pregnant mothers' hb level, prevent DNA damage due to stress and prevent the occurrence of anaemia on pregnant mothers.

**Source of Funding:** This study was sponsored by Ministry of research and higher education

**Ethical Clearance :** Ethical Commission of the Faculty of Public Health of Universitas Hasanuddin Number 1071909130.

**Conflict of Interest :** None

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# Analysis of Drug Logistics Planning at Medical Management Agency in Ambon City Health Office (Qualitative study)

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## Abstract

In health services, the drug can save lives and improve health quality. So the provision of essential medicines is mandatory and requires government support at all levels, both central, provincial and Regency/city. The existence of such support can be activities, budgets and commitments. The purpose of this research is to know the system of drug planning in the technical implementation Unit of the Regional Office of Medicine management in Ambon City Health office. This type of research is a qualitative study. Data collection is done through in-depth interviews, observation and document study. Information collected from 6 people who are involved in the management of drugs in the technical implementation Unit of the Regional Office of the Department of Medicine of the city Health office in Ambon. The results showed that drug planning uses a special team with the calculation of drug needs using method of consumption. The emptiness and excess medication are still common due to the change in public health centers affecting the drug prescribing patterns. Therefore, it needs a good coordination between the planning team in the technical implementation Unit of the regional office of the District Health Care office in Ambon City with a doctor at the Public health center in the area to be obedient in writing prescriptions according to the medication that has been ordered.

***Keywords**: Planning, medicine, Kota Ambon, Unit of the Regional Office of the Department of Medicine*

## Introduction

In Indonesian, in 2018 there are 89.69% of pharmacy installation of District/city that has been conducting management of drug and vaccine management as per standard. Such use has fulfilled the target of 2018, which is 75%. It is known that most of the provinces have fulfilled the target of 75% which is 30 provinces and there are 18 provinces that have reached a target of 100%. There are 4 provinces that have not yet reached the target of the Renstra 2018 is Bengkulu Province (70.00%), Maluku (45.45%), West Papua (38.46%) and DKI Jakarta (0.00%). In particular, DKI Jakarta province from 6 installation of Pharmacy district/city does not directly conduct drug and vaccine management as per standard but management and distribution is carried out directly on the District pharmacy installation through the Fund of State Budget income and expenditure[1]. The availability and quality of the drug in the regional technical implementation Unit of the Center for Drug Management of the city Health Department in Ambon is very influential in the service of providing medicine to people who are sick or who need without any changes in the quality of the drug

Based on the results of the study of documents obtained the type of drug item expired in 2016 as much as 141 type of drug with the number of drugs including the type of paracetamol tablets 500 mg as much as 158,525. In the year 2017 the type of drug is as many as 206 types of drugs with the most numerous drugs including the type of Vitamin B complex tab as much as 391,566. The

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year 2018 as many as 121 types of drugs are expired and the most widely included types of Thiamine (Vitamin B1) tablets 50 mg as much as 767,483. Based on the problems found, researchers want to know the planning of drug Logistics in the Unit of the Center for Drug Management of the city Health Office in Ambon.

## Materials and Method

The type of research used is this research is a type of qualitative study. Data collection is done through in-depth interviews, observation and document study. Information collected from 6 people who are involved in the management of drugs in the technical implementation Unit of the regional Health Care office of the Ambon City Department of Medicine. To ensure the diversity of data is used triagulation technique

## Results

This research was conducted in the technical implementation Unit of the Regional Medical Management Hall in Ambon City Health office in January to February 2020. This research is a qualitative study intended to determine the management of drug management in the regional technical implementation Unit of the district Medical Management center in Ambon. The study used in-depth interview techniques, document study and observations. The variables are researched namely the process of drug planning. The informant involved in the research is the head of pharmaceutical installation, pharmacist of pharmaceutical installation and drug warehouse management.

**1. Planning**

**A. Special team of drug planning**

The purpose of the drug planning is to establish the type and amount of medicine and health supplies appropriate according to the needs of basic health care. In connection with the above, it is absolutely necessary coordination and alignment in the planning of procurement of medicines and health supplies, so that the establishment of a drug planning team is a necessity in order to improve the efficiency and effectiveness of the use of funds through coordination, integration and synchronization between agencies related to drug problems in every district/city[2].

Based on the results of interviews with the informant in the technical implementation Unit of the District Medicine Hall management Ambon City about the presence of a special team in the drug planning obtained the following information:

"So in accordance with the decree made from the head of the city health Office in Ambon There is a name of the drug planning team, this drug planning team involves cross-program, in this case starting from the regional technical implementation Unit of the drug management hall itself then from its pharmacy section then from the holders of programs that use the drug in this case nutrition Program, KIA, P2p and the health center (HK, 48 years old)"

"The planning team was there and all staff of the regional technical implementing Unit drug management hall is involved for planning". (BE,52 years)

"Well all that in the pharmacy installation district here anyway, the head of the pharmacy installation district, functional pharmacist and pharmaceutical power. Everyone here must be involved, you need in the data what each section will answer about the need for the head of the hall anyway ". (JG,49 years)

B. Compilation of drug use

From the results of interviews with informant in the technical Implementation unit of the District Health Care office in Ambon City about the compilation of drug use obtained the following information:

*"Usually for our planning average usage of a year from the use of January to December we share with 12 and we can the results of planning a month and added also with a buffer Stocknya for 8 months". (BE,52 years)*

"The medicine is based on Dong have the data inevitably going in planning the next year there is a public health center planning, but the planning was like I said that, do not run away from what the Formularium of public health centers that are in the adoption of the national Formularium, continue based on their usage. So stay he saw that last year he evolved or he was reduced or no it was later in view of their request. Keep that request is certainly attributed to Katong have funds from DAK Kan. They want to ask how much is well certainly in adjusting to the budget DAK given ". (JG,49 years)

**C. Calculation of drug needs**

From the results of interviews with informant in the regional technical implementation Unit of the district Medical Management center in Ambon on the calculation of drug needs obtained the following information:

"This method of consumption is this Pak Yapi's for example in a year from January to December we will see for example one of paracetamol drugs, paracetamol used by public health centers A to Z how total is used in a year means that the consumption pattern for paracetamol in a year ago. It became the basis of the policy to plan the following year and then we add the buffer stock of how, usually still closer to reality compared with other methods such as morbidity method is designed based on the objectives that want to be achieved sometimes the goal that you want to achieve this could also be somewhat sidetracked, the target is a thousand we provide a thousand when in fact only reaches five (HK 48 years)

"Mortality eg or can be with the method of use, so usually used that method of mortality" (BE,52 years).

"The Consumptive method is based on the use of the field." (VH,40 years)

The results of interviews with the informant regarding the calculation of the drug needs known that the calculation of drug needs in the Regional technical Service Unit of the district health Care office in Ambon is using the method of consumption is by looking at the data usage of the drug in the previous year and not using morbidity method because it can be very far from the estimate.

D. Constraints in the preparation of drug planning

From the results of interviews with an informant in the regional technical implementation Unit of the district health Care Office in Ambon, the treatment of drug planning obtained the following information:

"Constraints inevitably exist. Mr. Yapi is sure to know a lot of obstacles in planning something because we plan it would want everything planned is approaching reality but in reality there are shifts. Related to the drug, we plan to use the method of consumption but in the service E the right to prescribe the doctor in the E if the prescribing pattern is alternated then it will affect also the consumption pattern of the drug and the prescribing pattern strongly influenced by the individual physician. We know that doctors centered on community health is relatively alternated, sometimes this doctor sometimes doctors that prescribing patterns will change for example last year antihypertensive which tends to be widely used is the captopril but so change the doctor's prescription pattern can change il become ambrodipin which was used to be in useless this year is used more means that the stock will be stocked out in this year while the captopril that was used many years is reduced so that the stock accumulates that sometimes become one of the obstacles in planning ". (HK 48 years)

"It's the best thing if people's health centers often switch to the doctor so that it affects the prescribing patterns that make the drug stock for certain medications that do not go well". (BE,52 years).

"If there is no one who does not understand E calculation for future planning it may be because the medication item too much ya kan usually it is right per drug item so error in calculating". (VH,40 years)

Based on the interview with the informant regarding the obstacles faced in the process of planning the drug in the regional technical implementation Unit of the district health Care office in Ambon City is known that the obstacles faced is the occurrence of the change of doctor in the Public health center so the drug prescribing also change and different from the previous year that causes stagnant and stock out drugs.

From the results of a document is known that the SOP Center for Drug Management in the city Health Department in Ambon for the treatment of drug planning is as follows:

A. To intensiize the letter of planning drug and BMHP needs from Public health center, the field of KESGA and P2P should be done according to the order of acceptance of the letter and stored in the file itself. Otherwise, the letter may be lost so that the drug planning does not meet the needs.

B. Implement the calculation of drug needs and BMHP planning based on the planning of Public health center and the field of family health and P2P DKK and

the availability of drugs in POAKPK hall and public health centers should be done carefully, carefully and accurately. Otherwise, the results of the drug planning calculations do not match what should be.

C. Research and study of proposals for drug planning and BMHP should be researched carefully and accurately. Otherwise, the results of the drug planning calculations do not match what should be.

D. Submission of proposed letter of calculation of drug and BMHP needs to be timely and targeted. Otherwise, it will inhibit the procurement process of the drug and BMHP.

E. Filing of proposed letter of calculation of drug needs and BMHP should conform to the standard archive. If not, it will be easily damaged and difficult to find/lost

## Discussion

Planning needs is an activity to determine the number and period of procurement of pharmaceutical preparations, medical devices, and medically consumables in accordance with the results of election activities to ensure the fulfillment of criteria is appropriate, precise quantity, timely and efficient. Planning is done to avoid the vacancy of the drug using the accountable methods and the foundations of predetermined planning among others consumption, epidemiology, combination of consumption methods and epidemiology and adjusted to the available budget[3].

### A. Special drug planning

The drug planning team is a team that is specially formed to develop the need for drug procurement and is one of the supporting factors to achieve smoothness and accuracy in drug planning. In-depth interviews conducted in the regional Technical services Unit of the district health Care office in Ambon City obtained information that there is a special team formed for the planning of the drug in accordance with the decree issued by the head of the city health office in Ambon.

The drug planning team involves a related cross-sector consisting of the head of the regional Technical Services Unit, the pharmaceutical personnel and the responsible for the program and from the Public Health Center itself. Involvement of various sectors in the planning of the drug is expected that the data needed for further planning can be submitted by each responsible by considering the state of field so that it is able to produce the planning that suits the needs of each part.

Based on the results of a thorough interview with the informant in the Regional technical Service Unit of the district health Care office in Ambon City can be concluded that there is a special team in the planning of drug needs. The planning team consists of a cross-sector that is the head of the regional Technical Services Unit in the Center for Drug Management, pharmaceutical personnel, and responsible programs and from public health centers.

This research is different from the research conducted by Prisanti that shows the results that in RISA Asiyiyah Klaten has not formed a special team to do planning and procurement of pharmaceutical preparations, all procurement is still done by the head of pharmaceutical installation. In the management of the drug, planning strategies include several processes that create an integrated drug planning team involving related elements, building a shared commitment to achieve a goal in an organization[5].

As for the research in line is research conducted in Pharmacy installation RSUD Andi Makkasau City Parepare which has a special team for drug planning. The team is formed from each unit to prepare the necessary drug planning in pharmacy installation of Andi Makkasau City Parepare[6].

### B. Compilation of drug use

The compilation of drug usage serves to determine the monthly usage of each type of drug in Health Service Unit/Health Center for a year and as comparative data for optimum stock. The results of an interview in the regional Technical Services Unit of the district health Care office in Ambon City has obtained information that the compilation of drug use is seen based on the use in the field whether it is increased or decreased use of the drug during the year

The calculations for the compilation of the drug are conducted based on usage data in a year then will be shared with twelve months added with the drug booking

waiting time which sometimes does not correspond to the plan. From the average usage of a year, you get planning results for the month to be added with a buffer stock for eight months. The result is in accordance with Permenkes No. 74 the year 2016 where it is said that the installation of Pharmacy district/city will compile and analyze the need for pharmacy preparations in the working area, adjust to the available budget and take into account the vacancy time of the drug, buffer stock, and avoid the excess stock[7].

**C. Calculation of drug needs**

Calculation of drug needs is done to determine the needs of the drug to be appropriately reviewed by type, quantity, or time. The blanks or excess types of certain medications can occur when calculations are only based on theoretical. Therefore, determining the need of medicine is a tough challenge that is always faced by pharmacists and pharmaceutical personnel who work both at PKD level and in UPOPPK Regency/city.

Calculation of drug needs in the regional technical Services Unit of the Center for Drug Management of the city Health Office uses methods of consumption by looking at data usage in a year. It was then made the basis for planning policy determination for the following year, also added from the stock buffer. Using the method of consumption makes planning closer to reality compared to other methods that can be far from the estimate that can result in the occurrence of excess or lack of drug stock.

This research in line with the research conducted in the Health office of Southeast Minahasa District showed that the determination of the number of drugs needed is done by consumption and buffer stock, i.e. the average use of years x 18 months. Determination of the amount of drug needs done in planning the needs of the public medicine is assessed as not yet appropriate with the data required to perform the calculation of the contemplation in public medicine management guidelines and health supplies[8].

Other research in line is done in pharmaceutical installation in hospital Porsea where based on the results of interviews on the informant related to the calculation of the number of drug needs is using the method of consumption based on the analysis of drug consumption data of the previous year. In calculating the approximate needs of the drug has not been in accordance with the steps present in the method of consumption due to leadtimes data and buffer stock is not used in this calculation. This is different from the research in the technical service Unit of the district administration of drug management in Ambon City, which takes into account the data buffer stock. It can be assumed that the public hospital pharmacy installation party Porsea assumed that the understanding of the consumption method was purely seen from the drug usage in the previous year[9].

**D. Drug planning constraints**

Problems in the planning of drugs can lead to discrepancies between the calculation of the drug with the realization of drug use. Based on the results of in-depth interviews with the informant known that the constraints of drug planning in the Regional technical Service Unit of the Center for Drug Management of the city Health Department in Ambon is often the change of doctor in Public Health Center and the error of calculating the drug due to the

Changes in the doctor affect the occurrence of consumption patterns and drug prescribing patterns, so even though it has been planned based on consumption methods but still occurs some shifts in drug use. Different prescribing patterns can occur in drugs that have the same function as for example for antihypertensive in the previous year tend to use a totopril drug but with the change of prescribing pattern doctors can turn into ambrodipin. Changes in the prescribing pattern may cause stock out in previously underused medications and excess stock for the drug often used over the previous year's period.

Research conducted in RSUP Prof. Dr. R. D. Kandou Manado showed the results that HNI drug procurement planning often have problems in terms of use of consumption method or usage data period ago. This is due to user behaviour in drug use. Given that planning is done by looking at the previous period usage data, then there is often a difference between the previous period usage data with the recipe writing pattern from the user in this case the doctor. Thus there is a gap between the HNI medications that have been provided with the medications used by the patient[10].

Other research in line was conducted in the pharmacy installation of the hospital Porsea where in the planning for the provision of pharmaceutical drugs and supplies had been in the drug vacancy. This can be caused by various things, namely the impact of the drug prescribed by doctors outside the national formulary and the impact of the electronic procurement system (e-catalogue). In this process stock in the distributor is sometimes empty so the ordered medication is not directly available and there are some types of drugs that are rarely used so that the excess drug occurs. Drug planning sometimes has constraints and obstacles so the goal of planning the drug is not achieved or in other words the drug is not available by number, type or not available on time[9].

## Conclusion

The study concluded that the drug planning uses a special team with the calculation of drug needs using the method of consumption. The vacancy and excess drug is still often due to the change of doctor in the Public health center that affects the drug prescribing patterns. Therefore, it needs a good coordination between the planning team at the regional technical implementation Unit of the district health Care office in Ambon City with a doctor at the Public health center in the area to be obedient in writing recipes according to the medicines that have been ordered.

**Ethical Clearance**- Taken from University ethical committee

**Source of Funding**- Self

**Conflict of Interest**– Nil

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# The Influence of Individual Characteristics on the Performance of Nutrition Program in Ambon City Public Health Center

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## Abstract

Human Development, including education and health, is one of the three pillars that are indicators in the development concept of Sustainabale Development Goals (SDGs). State nutrition status of Indonesia from year to year shows improvements although still faced with various challenges that are quite severe. The purpose of this research is to analyze the influence of individual characteristics (age, gender and education) on the performance of nutrition Program in the Community Health center of Ambon. This type of research is quantitative research with the design of Cross Sectional Study. The population in this study is all the energy Center public Health that works in 22 public health centres as much as 54 people. Sampling techniques in a total sampling way. The results showed that there were no age and gender relations with the performance of the nutrition Program in the Community Health center of Ambon with the value P = 0138 and 0519. However, there is an education relationship with the implementation of nutrition Program in the Public health center of Ambon City with the value P = 0.004. Therefore, the Public health center can apply for a nutritional officer to get a scholarship or provide facilities and to resupply the nutritional officers to pursue higher education in order to make nutrition performance more maximal.

***Key Words**: Umur, Jenis Kelamin, Pendidikan, Kinerja, pelaksana gizi, Puskesmas*

## Introduction

State nutrition status of Indonesian from year to year shows improvements although still faced with various challenges that are quite severe. Various indicators that measure nutritional status on life cycle is still not encouraging, this is evidenced by the results of basic health research, child nutrition condition. In the stunting problem of toddlers 30.79% in 2018. Likewise, underweight in children of toddlers is 17.68% at 2018 wasting or skinny children yaitu10, 19% in 2018.[1]

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The Community Nutrition Improvement Program is one of the main programs of the Public Health center where one of the key functions is to is to prepare, nurture and sustain that everyone has good nutritional status, can live healthy and productive. This function can be realized if every officer in implementing nutrition program is done in a way that is good and correct according to components that must exist in the nutrition Improvement Program in public health Center. Ambon City Health Office is an integrated service Unit (UPT) of the Government of Ambon which is responsible for organizing government affairs in the field of health in the city of Ambon has 22 public health centers with the number of nutritional implementing personnel as much as 54 people in the Public health center.

Nutritional factors are a major factor in the improvement of human resources (SDM). Low human resources will impede the success of national development. The nutritionist of the Human Resources Health Center who has the ability and/or skills in the health sector appointed to carry out the task of nutrient improvement in the public health center. If there is no nutritional personnel who have graduated education in the field of nutrition in accordance with the legislation, then the implementation of nutritional improvement tasks in the Public health center can be done by the nutritionist who comes from other health workers such as nurses or midwives[2]. The goal in research research is to analyze the influence of individual characteristics (age, gender and education) on the performance of nutrition Program in the Community Health center of Ambon.

## Materials and Method

The type of research used is quantitative research with Cross Sectional Study. The population in this study is all employees who work in public health centers, 22 public health centers with the number of nutritional implementing personnel as much as 54 people. The sampling technique in this study was the total sampling so that the number of samples in this study was 22 public health centers with the number of nutritionist personnel as much as 54 people in the Public health center. Data collection is obtained through interviews using data processing questionnaires conducted in computerised by using SPSS program. Data presented in narrative form, frequency distribution table accompanied by interpretation

## Results

According to table 1, it is known that from 54 respondents, the characteristics of respondents based on the most age group are groups of 31 – 40 years, which are as many as 32 respondents (59.2%). The characteristics of the respondents based on the sex of the most are respondents with a female gender of 50 respondents (92.6%). The characteristics of respondents based on the last education of the most are the respondents with the education Asosiate's Degree which is 36 respondents (66.7%)

**Table 1.: Distribution of respondents based on characteristics of the respondents nutrition Program at Ambon City Health center in 2020**

| **Characteristics** | **Amount (n)** | **Percent (%)** |
|---|---|---|
| a. Age (years) | | |
| 21-30 | 8 | 14.8 |
| 31-40 | 32 | 59.2 |
| 41-50 | 13 | 24.1 |
| 51+ | 1 | 1.9 |
| **Total** | **54** | **100.0** |
| b. Gender | | |
| Male | 4 | 7.4 |
| Girl | 50 | 92.6 |
| **Total** | **54** | **100.0** |
| c. Education | | |
| D1 | 4 | 7.4 |
| D3 | 36 | 66.7 |
| S1 | 14 | 25.9 |
| Total | 54 | 100.0 |

Source: Primary Data, 2020

**Table 2: Variable frequency distribution performance of implementing personnel**

**The nutrition Program at Ambon City Health Center in 2020**

| The performance | Amount (n) | Percent (%) |
|---|---|---|
| Not good | 19 | 35.2 |
| Good | 35 | 64.8 |
| Total | 54 | 100.0 |

Source: Primary Data, 2020

Table 2 shows that from 54 respondents at the Public health Center in Ambon city based on performance variables, as many as 19 respondents (35.2%) which provides an Ungood performance assessment and as much as 35 respondents (64.8%) That provide a good performance assessment.

Influence of individual characteristics to officer performance

The results of the analysis of the influence of individual characteristics of age, sex and last education of the officer's performance can be seen in table 3

**Tabel 3. Effect of respondents characteristics on the performance of the implementing personnel nutrition Program at Ambon City Public Health Center in 2020**

| Individual Characteristics | Officer Performance | | | | amount | | p |
|---|---|---|---|---|---|---|---|
| | Not good | | Good | | | | |
| | n | % | n | % | n | % | |
| Age (years)<br>21-30 | 5 | 62.5 | 3 | 37.5 | 8 | 100.0 | 0.138 |
| 31-40 | 10 | 31.3 | 22 | 68.8 | 32 | 100.0 | |
| 41-50 | 3 | 23.1 | 10 | 76.9 | 13 | 100.0 | |
| > 51 | 1 | 100.0 | 0 | 0 | 1 | 100.0 | |
| Gender<br>Male | 2 | 50.0 | 2 | 50.0 | 4 | 100.0 | 0.519 |
| Girl | 17 | 34.0 | 33 | 66.0 | 50 | 100.0 | |
| Education<br>D1 | 1 | 25.0 | 3 | 75.0 | 4 | 100.0 | 0.004 |
| D3 | 18 | 50.0 | 18 | 50.0 | 36 | 100.0 | |
| S1 | 0 | 0.0 | 14 | 100.0 | 14 | 100.0 | |

Source: Primary Data, 2020

Table 3 Products that of 8 respondents included group age 21 – 30 years, as many as 5 respondents (62.5%) With the performance assessment of the officers is not good and as many as 3 respondents (37.5%) With a good personnel performance assessment. From 32 respondents included group age 31 – 40 years, as many as 10 respondents (31.3%) With the performance assessment of the officers is not good and as many as 22 respondents (68.8%) With a good personnel performance assessment. Of the 13 respondents included the age group 41 – 50 years, 3 respondents (23.1%) With the performance assessment of officers not good and as many as 10 respondents (76.9%) With a good personnel performance assessment. While, from 1 respondent included age group > 51 years provide the performance assessment of the officer is not good. Statistical test result of value obtained P = 0.138, because the value of p > α = 0.138 > 0.05 then Ho accepted, this means that there is no statistically meaningful influence the variable age of respondents to the performance of officers of the program domiciled in the Public health center Ambo City.

For gender variables show from 4 respondents with male gender, as many as 2 respondents (50.0%) With the performance assessment of the officers is not good and as many as 2 respondents (50.0%) With a good personnel performance assessment. As for 50 respondents with female gender, 17 respondents (34.0%) With the performance assessment of the officers is not good and as many as 33 respondents (66.0%) With a good personnel performance assessment. The results of the statistical test obtained the value P = 0519, because the value of p > α = 0519 > 0.05 then Ho accepted, this means that there is no statistically meaningful influence on the variable gender of the respondent to the performance of the Implementing Officer nutrition program in the Community Health center of Ambon.

For the level of education of 4 respondents with the education of D1, 1 respondent (25.0%) With the performance assessment of the officers is not good and as many as 3 respondents (75.0%) With a good personnel performance assessment. From 36 respondents with an education of D3, as many as 18 respondents (50.0%) With the performance assessment of officers not good and as many as 18 respondents (50.0%) With a good personnel performance assessment. As for 14 respondents with S1 education, all have a good assessment of the performance of the officer. The statistical test result is obtained P = 0.004 value, because the P value is < α = 0.004 < 0.05 then Ho is rejected, this means that there is a statistically meaningful influence of the respondent education variable to the performance of the Implementing Officer nutrition program in the Community Health center of Ambon..

## Discussion

The characteristics of each person will be influenced by physical fitness and individual mental health concerned, education, accumulated training, and their working experience. Physical fitness makes people capable and resistant to work hard and long. While education and training are part of human investment. The longer the time that one is used for education and training, the higher the ability or competence of doing the job, thus the higher its performance[3].

The productivity of someone in work is influenced by age. Success in doing a job is determined by the age of both physical and non-physical. In general, old Labor has strong physical capacity[4]. The Central Statistic Agency (2016) states that a person's productive age is 15-64 years of potential as a capital in development. Productive age has features like forward-thinking, broad knowledge, and high productivity[5].

Table 3 shows the results of the statistical test obtained the value P = 0138, because the value of p > α = 0138 > 0.05 then Ho accepted, this means that there is no statistically meaningful influence on the variable age of respondents to the performance of the Implementing Officer nutrition program in the Community Health center of Ambon. This research is supported by research[6] which suggests that age is not a variable related to public health care service activities. Whereas Ratnasari[7] in his research found that there is no age influence on the implementation of public health nursing services in public health centers. Robbins[8] said that performance may decline as we age, but older age is offset by the practice.

The gender difference between women and men lies in the body size and power. Men can finish heavy work that women cannot do. Women tend to use feelings or biological factors such as leave when giving birth. Table

9 shows that of 4 respondents with male gender, as many as 2 respondents (50.0%) With the performance assessment of the officers is not good and as many as 2 respondents (50.0%) With a good personnel performance assessment. As for 50 respondents with female gender, 17 respondents (34.0%) With the performance assessment of the officers is not good and as many as 33 respondents (66.0%) With a good personnel performance assessment. The results of the statistical test obtained the value P = 0519, because the value of $p > \alpha = 0519 > 0.05$ then Ho accepted, this means that there is no statistically meaningful influence on the variable gender of the respondent to the performance of the Implementing Officer nutrition program in the Community Health center of Ambon.

Robbins[8] argues that there is no consistent difference in problem solving skills, analytical skills, competitive encouragement, motivation, sociability or learning ability between men and women. But there is a tendency for women who have preschoolers to do work flexibly, part-time, to work at Home Office work. Nevertheless,[9] states that female employees tend to be more diligent, disciplined, thorough and patient.[10] also stated that the average performance of male and female nurses has no distinction. The research conducted by Mahendra (2014) on the influence of education, wages, gender, age and work experience on labor productivity, stating that the level of one's productivity is influenced by gender differences. Male productivity levels are higher than women. The work of women requires skill and less need of heavy exertion[11]. A nutritionist should have skills and experience in the PGRS process in order to carry out their duties properly. It can be supported by a formal education owned by a nutritionist[12].

Table 3 shows the results of the statistical test obtained the value P = 0.004, because the value P is $< \alpha = 0.004 < 0.05$ then Ho is rejected, this means that there is a statistically meaningful influence on the variables of the respondent to the performance of the nutrition program in the Community Health center of Ambon. This study is in line with the research conducted by[11] i.e. the level of education of a workforce is positively influential in productivity. This is because someone with a high education has more knowledge to increase their productivity. These results are not in line with research[13] which indicates that there is no difference between the level of education on health counseling activities. The same is also stated by Tafwidhah in his research that the relationship between education and the level of implementation of public health care activities is not proven.[7] in his research suggests that it does not influence the level of education on the implementation of Perkesmas[13]. The level of education affects a person's mindset. The higher the level of one's education, the better the mindset will be. A good mindset will result in high productivity[14-16]. Kurniawan stated that someone who is aware of the importance of productivity can encourage the workforce to perform productive actions[17].

## Conclusion

This research concluded that there is no age relationship and each sex with the power performance of the nutritional program in the center of the community in the city of Ambon with the value P = 0.138 and 0.519. However, there is an educational relationship of the energy performance of the nutrition program in the center of the community of Ambon city with a value P = 0004. Therefore, the Trust Center of Public Health can apply for a nutritional officer to get a scholarship or provide facilities and to resupply the nutritional officers to pursue higher education in order to make nutrition performance more maximal.

**Ethical Clearance**- Taken from University ethical committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

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# Analysis of Ability and Willingness to Pay Patients in Psychiatric Clinics (Special hospital case study in Maluku Province)

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## Abstract

The ability to pay and the willingness to pay is a contributing factor in the utilization of services. The population in this study was a general patient who was educated at a psychiatric clinic in the Special Hospital of Maluku Province, 2019. The samples in this study are common patients who are given services to psychiatric clinics. The number of samples obtained using accidental sampling techniques obtained as much as 48 people. The results showed that patients could pay (Abilitiy to Pay) at psychiatric clinics at a rate of Rp. 80,000 with the ability to pay a maximum of Rp. 175,000 and the ability to pay a minimum of Rp. 40,000 whereas the willingness to pay (willingness to pay) normative patients at the Special Hospital Psychiatric Clinic of Maluku region is Rp. 82,083 with a willingness to pay a maximum normative amount of Rp. 100,000 and a willingness to pay a minimum normative cost of Rp. 75,000. Hospitals can revise tariffs in psychiatric clinics taking into account the level of ability and willingness of the community and set rates that do not exceed the ability to pay the community.

***Keywords:*** *ATP, WTP, psychiatric clinic*

## Introduction

The ability to pay and the willingness to pay is a contributing factor in the utilization of services. The ability to pay can be measured by the calculation approach of family income, family assets, or household expenditure. The willingness to pay can be done in the first two ways of measuring the actual ability to measure the amount of expenses a person has paid for health care and normative ability can be done by asking how many individuals are willing to issue health services[1].

This study chose service at the psychiatric clinic, because this clinic is one of the clinic in the outpatient installation that the most number of visits from other outpatient clinics clinics. In addition, the reason for choosing a psychiatric clinic because the tariff of public services of hospitals specialized in Maluku province based on local regulations No. 13 year 2013, then in the update the Tariff of public service levy according to regional regulations No. 1 year 2019 where this psychiatric clinic tariff has been running for approximately 6 years still with a tariff of Rp 75,000,-(seventy Five thousand rupiahs) for a one-time visit regardless of the type of therapy given because the tariff is not based on the type of therapy. So whatever action is given to the patient then the patient still pays the same magnitude[2].

Based on the above data, it is necessary to analyze the ability and willingness to pay the patient or the community of health services users so that the appropriate costs can be known. By knowing the ability and willingness to pay the community, the hospital can

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estimate how much the tariff does not cause harm to the hospital, but not also the Community health services users

## Materials and Method

The type of research used is quantitative research with a descriptive survey to analyse the ability to pay (ability to pay) and willingness to pay (willingness to pay) general patient clinics in the provincial district special Hospital of Maluku. The population in this study is a common patient who gets service to the psychiatric clinic in the regional Special Hospital of Maluku province. The samples in this study were common patients at the clinic for the life of the ministry. The number of samples obtained using accidental sampling technique obtained as much as 48 people. Data collection is obtained through interviews using data processing questionnaires conducted in computerised by using SPSS program. Data presented in narrative form, frequency distribution table accompanied by interpretation.

## Results

According to table 1, there are known food expenditure of respondents at most between Rp. 1.000.000-Rp. 1.500.000, which is as much as 29 respondents or 60.4% and the least amount spent in > Group of Rp. 1.500.000, which is 5 respondents or 10.4%, based on household expenditure for non-food is seen that the respondents at most between Rp. 1.000.000-Rp. 1.500.000, which is 23 respondents or 47.9% and the fewest expenditure on the group of Rp. 500.000-Rp. 1.000.000 is 8 respondents or 16.7%. The amount of cost for non-essential respondents was shown that most respondents were in the category of < Rp. 500,000 as many as 28 respondents or 59.3% and at least in the category of > Rp. 1.000.000 as many as 2 respondents or 4.2%

**Table 1. The distribution of respondents based on expenditure on the psychiatric clinic in the provincial district Special Hospital of Maluku in 2020**

| Expense Category (Rp) | Respondents | |
|---|---|---|
| | Amount (n) | Percentage (%) |
| Food Expenditures | | |
| 500,000 - 1,000,000 | 14 | 29.2 |
| 1,000,000 - 1,500,000 | 29 | 60.4 |
| > 1,500,000 | 5 | 10.4 |
| Non-Food Expenditures | | |
| 500,000 - 1,000,000 | 8 | 16.7 |
| 1,000,000 - 1,500,000 | 23 | 47.9 |
| > 1,500,000 | 17 | 35.4 |
| Non-Essential Expenditures | | |
| <500,000 | 28 | 59.3 |
| 500,001 - 1,000,000 | 18 | 37.5 |
| > 1,000,000 | 2 | 4.2 |

Source: Primary Data, 2020

The calculation of ability to pay respondents to this study is used to calculate the level of the general patient's ability to pay rates in the hospitalisation area of special hospitals in Maluku province by using ATP 5% of household expenditure on food (table 2).

**Table 2. Distribution of ability to pay (ATP 1) respondents based on 5% Non-food expenditure on psychiatric clinics in the provincial Special Hospital of Maluku Province in 2020**

| Category | Paying Ability |
|---|---|
| | 5% Non Food expenses (Rp) |
| Maximum<br>Minimum | 175,000<br>40,000 |
| The mean | 80,000 |

Source : Primary Data, 2020

Based on table 2 indicates that the minimum ability to pay respondents using non-food ATP formula is Rp. 40.000 and maximum non-food is Rp. 175.000. Average ability to pay non-food respondents is Rp. 80.000.

**Table 3. Distribution of willingness to pay (WTP) actual and normative respondents at the psychiatric clinic In Maluku Provincial District special Hospital in 2020**

| Category | Actual Paying Will (Rp) | Willingness to Pay Normative (Rp) |
|---|---|---|
| Maximum<br>Minimum | 150,000<br>75,000 | 100,000<br>75,000 |
| The mean | 79,687 | 82,083 |

Source : Primary Data, 2020

Table 3 shows that the actual WTP respondent indicates that the minimum willingness to pay the actual respondent at the clinic's average soul is Rp. 75.000, and the maximum willingness to pay respondents amounted to Rp. 150,000 with an average of the willingness to pay the actual amount of Rp. 79,687. While the average willingness to pay normative suggests that the minimum willingness to pay a normative respondent in the clinic of the average soul of Rp. 75.000, and the maximum willingness to pay a normative respondent of Rp. 100,000 with an average of the willingness to pay the actual amount of Rp. 82,083,-.

## Discussion

The ability to pay health or be known by Ability to Pay (ATP) is a cost that can be allocated by a person to finance related health services. In this study ATP was calculated according to the 5% formula of total non-food expenditure. The high income is directly proportional to the higher expectations to obtain the service in accordance with the costs incurred to obtain the service. The results of this study are in line with research conducted by Mudayana stating that family income affects the patient's ability to pay for healthcare services that have been given, if the patient's income

is still lacking, they assume they are unable to pay for health services[3].

Expenditure to eat in this research consists of the expenditure of respondents in a month which is the form of grain, tubers, fish, vegetables, nuts, fruits, kitchen spices and other consumption calculated in units of rupiah. The results of this study also showed that the average of the spread for food was in the range of 1 million-1.5 million as few as 29 respondents (60.4%). This is because food expenditure is a basic necessity that must be fulfilled for the continuity of human life.

In this study non-food expenditure, the total of the monthly spending of respondents in the form of expenses for daily necessities such as tuition fees, housing, household purposes, the cost of various goods and services, durable goods, and expenses for taxes and house contracts that are calculated in the rupiah unit. Based on the results of the study, the greatest non-food expenditure is expenditure on electricity, gas and water payments. This is because this expenditure must be issued each month as well as soap and transportation requirements. While the fewest non-food expenditures are expenditure on durable goods such as kitchen appliances, cutlery and mobile phones. This is in line with the research done by Marzuki et al, 2019 which shows the expenditure to eat, greater than the expenditure for non-food and non-essential expenditure.[4]

Non-essential expenditure is a month-long household expenditure covering the expenditure of parties, ceremonies, cigarettes, alcohol, snacks as well as spending on entertainment calculated in the rupiah unit. According to table 1, it is known that most respondents are in the category of < Rp. 500,000, which is 28 respondents or 59.3% and at least in the category of > Rp. 1.000.000 as many as 2 respondents or 4.2%. Non esesnial evasion is generally not large because the implementation is rarely done every month but only once a year. The results of this study in line with the research Istiqamah et al, 2019 showing the largest non-essential expenditure was in Class 3 as much as 41.4%[5]. The research conducted by Hardy which stated that the greater the ability to pay respondents then the higher the class of care selected and vice versa[6].

The ability to pay patients will have an effect on his accessibilities to healthcare services. The lower the ability to pay a person then the lower the access to health services. The ability to pay is also determined by a person's income level. The greater the income level the greater the access to healthcare services.

The ability to pay is calculated using concepts. Based on 5% of total non-food expenditure. In table 2 shows that the largest ATP is in the range of Rp. 175,000 and the smallest of Rp. 40,000 with an average pay capacity of Rp. 80,000. In this research the pay ability used to calculate rational tariff assumptions is based on 5% of non-food expenditure. With the consideration that non-food needs in addition to secondary and tertiary needs, also in non-food components there is an expense that is destructive in health, such as cigarettes. It can generally be noted that this destructive household expenditure is precisely greater than the expenditure on health. This research is in line with the done (Annaafia et al., 2020) at Kaliwates General Hospital Jember district showed the ability to pay higher society than the prevailing tariff[7]. This research is not in line with the Done (Wirajaya, 2019) at Puri Raharja General Hospital Denpasar showed ATP < Rp 1 million for 55% was in class II and III and the smallest of Rp 4,000,001 to Rp 5 million for 1.5% which is in the VIP class[8].

The willingness to pay consists of the willingness to pay actual and the willingness to pay normative. The willingness to pay the actual amount based on the cost of the respondent during the treatment of the psychiatric clinic in one month in the hospital while the willingness to pay normative is the amount that is willing to be paid according to the perception of the respondent about the condition of health care in the psychiatric clinic of the Regional Special Hospital

Willingness to pay respondents are willing to pay health care services at the hospital above the prevailing rates if the services including completeness of facilities and infrastructure can be improved and the improvement of health services is maximised. The willingness or willingness of patients to pay services provided by the hospital, should the hospital should be able to further improve the quality of service the willingness to pay high health services is usually driven by the perception of a person in choosing a class of treatment based on good quality of service. These patients will appreciate the quality of service compared to the price they have to

pay, while the quality of service takes precedence over the opportunity for patients who have a high willingness to pay. Hospital needs to pay attention to their wishes and complaints[9-11].

If compared between the ability and willingness to pay respondents to the current tariff rate, it can be seen that the average maximum ability and maximum willingness to pay patients is equally higher than the current tariff rate. This condition indicates that the ability to pay almost as much as the desire to pay the service. It belongs to the ideal tariff determination zone

## Conclusion

This research concluded that the ability and willingness to pay the society is still high compared to the tariffs prevailing at the psychiatric clinic. Therefore, the hospital can revise the tariff on the psychiatric clinic by considering the level of ability and willingness of the community as well as setting the tariff not exceeding the community's paying ability.

**Ethical Clearance**- Taken from university ethical committee

**Source of Funding**- Self

**Conflict of Interest**– Nil.

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# Factors Corresponded to Health Service Utilization of Chronic Disease Management Program (Prolanis) Patient in Health Center Lateri Ambon City Post-Earthquake

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## Abstract

The objective of chronic disease management Program (Prolanis) encourages patient with chronic illness to achieve optimal quality of life and 75% of patient have the "good" results on the specific examination of the disease DM type II and hypertension so as to prevent the onset of disease complications. The purpose of this research is to know the factors related to the utilization of post-earthquake service Prolanis. This type of research is analytic survey research using cross sectional approach design. The population in this study is all prolanis patient who utilize the service in the Public Health center after the earthquake as many as 69 patient. The sampling techniques in this study were the total sampling so that the number of samples in this study of 69 respondents showed that there was no age-old relationship with the utilization of Prolanis services in post-earthquake community health centres (P = 0,271) However, there was a gender relationship (0.000), education (P = 002), and marital status (P = 0,006). Therefore, the Lateri Public Health Center can play an active role and reach out to prolanis patient who utilize the post-earthquake service so that they can maintain and increase the degree of health especially in people with chronic diseases such as hypotensions and diabetes mellitus.

***Keywords**: Prolanis, utilization, post-earthquake, Public health Center*

## Introduction

The Chronic Disease Management Program (Prolanis) is an integrated healthcare system and proactive approach that involves patient, health facilities and BPJS healthcare in order to maintain health care for the optimal patient of BPJS Health with the cost of effective and efficient health services. The target of Prolanis activities are all patient of BPJS health with chronic disease especially Diabetes Mellitus (DM) type II and hypertension. This is carried out by first-rate health facilities (FKTP) both in government FKTP and private FKTP. Prolanis aims to encourage patient with chronic illness to achieve optimal quality of life and 75% of patient have the "good" results on the specific examination of the disease of DM type II and hypertension so as to prevent the onset of disease complications[1]

The number of sufferers of Diabetes mellitus type 2 continues to increase in Indonesia. Based on RISKESDAS 2018 the prevalence of Diabetes mellitus in population aged > 15 years for Indonesia is 2.0%. In addition to diabetes mellitus type, hypertension is also a burden of non-infectious diseases that are harmful because of its effects that can spread to other diseases. The prevalence rate of hypertension based on the measurements in population aged ≥ 18 years in regional health research 2018 increased sharply by 34.1%.[2]

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Based on secondary data at the Leteri Public Health center obtained by researchers, the number of pronalists patient registered in Leteri Public health centers as many as 134 patient and who utilize prolanis services from January to October 2019 as many as 69 patient per month.[3] in November 2019 until December 2019 there was a decrease in the number of visits in each month as many as 69 patient in 40 patient. The decline in the number of visits occurred in the aftermath of the earthquake that occurred in September 2019 in the city of Ambon caused many people to evacuate so as not to utilize the service of Prolanis in the Lateri Community Health Center. By the time this research aims to determine what factors influence the utilization of the service of Prolanis patient in the health center post earthquake Lateri society

## Materials and Method

The type of research used is an analytical survey using the design of a cross sectional approach. The population in this study is all prolanis patient who utilize the service in the Public Health care center after the earthquake as many as 69 patient. The sampling technique in this study was a total sampling so the number of samples in this study was 69 respondents. Data collection is obtained through a live

## Results

According to table 1, it is revealed that from 69 respondents based on the respondent's age, most of the age group > 60 years as many as 37 respondents (53.7%) And the least number of respondents in the age group of 41-50 years as many as 2 respondents or amounting to (2.9%). According to gender, respondents were the most female groups of 53 people (76.8%) And the fewest number of respondents in males is as much as 16 people (23.2%). Based on the most recent education is the category SMA/equal to 28 people (40.6%) And the least number of respondents were the group did not end the elementary school as much as 2 people (2.9%). Based on the marital status, the most widely married category of 53 people (76.8%) And the fewest number of respondents were not married for 2 people (2.9%)

**Table 1. Distribution of Respondents Based on the Characteristics of Respondents from Prolanis patient in the lateri health center post-earthquake in 2020**

| **Push Factor** | **Number (n)** | **Percent (%)** |
|---|---|---|
| a. Age (yr) | | |
| 30-40 | 20 | 28.9 |
| 41-50 | 2 | 2.9 |
| 51-60 | 10 | 14.5 |
| > 60 | 37 | 53.7 |
| Total | 69 | 100 |
| b. Gender | | |
| Male | 16 | 23.2 |
| Female | 53 | 76.8 |
| Total | 54 | 100 |

| | | |
|---|---|---|
| c. Education | | |
| Not completed in primary school | 2 | 2,9 |
| Graduated from elementary school | 4 | 5.8 |
| Graduated from middle school | 6 | 8.7 |
| Graduated from high school / vocational school | 28 | 40.6 |
| D3 | 19 | 27.5 |
| Graduated from college | 10 | 14.5 |
| Total | 69 | 100 |
| d. Marital status | | |
| Marry | 53 | 76.8 |
| Divorce | 14 | 20.3 |
| Single | 2 | 2,9 |
| Total | 69 | 100 |

Source: Primary Data, 2020

**Factors related to the utilization of Prolanis patient service in the Lateri Health center of Post-earthquake**

The results of the analysis of the influence of individual characteristics of age, sex and last education of the officer's performance can be seen in table 2

**Table 2. Factors related to Utilization of Prolanis patient Services at the Lateri community health center Post-Earthquake**

| **Research variable** | **Utilization** | | | | **amount** | | **p** |
|---|---|---|---|---|---|---|---|
| | **Make use of** | | **Underutilizing** | | | | |
| | **n** | **%** | **n** | **%** | **N** | **%** | |
| Age Group (year) | | | | | | | |
| Adult | 23 | 71.9 | 9 | 28.1 | 32 | 100 | |
| Elderly | 31 | 83.8 | 6 | 16.3 | 37 | 100 | 0.271 |
| amount | 54 | 78.3 | 15 | 21.7 | 69 | 100 | |
| Gender | | | | | | | |
| Male | 6 | 37.5 | 10 | 62.5 | 16 | 100 | |
| Girl | 47 | 90.6 | 6 | 9.4 | 53 | 100 | 0,000 |
| amount | 54 | 78.3 | 15 | 21.7 | 69 | 100 | |
| Education | | | | | | | |
| Basic | 3 | 50 | 3 | 10 | 6 | 100 | |
| Advanced | 51 | 81 | 12 | 19 | 63 | 100 | 0.002 |
| amount | 54 | 78.3 | 15 | 21.7 | 69 | 100 | |

***Cont...*** **Table 2. Factors related to Utilization of Prolanis patient Services at the Lateri community health center Post-Earthquake**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Marital status<br>Married<br>Not married / divorced | <br>43<br>11 | <br>81.1<br>68.8 | <br>10<br>5 | <br>18.9<br>31.2 | <br>53<br>16 | <br>100<br>100 | 0.006 |
| amount | 54 | 78.3 | 15 | 21.7 | 69 | 100 | |

Source: Primary Data, 2020

Table 2 shows that out of the 32 respondents who have grouped adult categories, there are 23 respondents (71.9%) That utilize the Prolanis health services in the Lateri Public Health center well and 9 respondents (28.1%) Who undertakes the use of medical services in the Lateri Public health center while from 37 respondents grouped by elderly there are 31 respondents (83.8%) Who utilize the Prolanis service in the Lateri Public health Center and 6 respondents (16.2%) Who undertakes the Prolanis service at the Public Health center of Post-earthquake. Statistical test results using the chi-square test obtained the value P = 0.271, because the value of p > 0.05 then there is no age group relationship to the utilization of the service patient in the Post Earthquake.

According to category of gender shows that of 16 respondents who have male gender, there are 6 respondents (37.5%) Utilizing the Prolanis Health Care Center in the Lateri Public health Centre and 10 respondents (62.5%) Who undertakes the use of medical services in the Lateri Public health center while 53 female respondents are 47 respondents (90.6%) Who utilize the Prolanis service in the Lateri Public health Center and 6 respondents (9.4%) Who undertakes the service of Prolanis at the Lateri Public Health Center. Statistical test results using the chi-square test obtained the value P = 0.000, because the value of p < 0.05 then there is a gender relation to the utilization of the service of the patient in the post-Earthquake Department center.

Based on the education category shows that out of 6 basic educated respondents, there were 3 respondents (50%) That utilize the Prolanis health services in the Lateri Public Health center well and 3 respondents (50%) Who undertakes the use of medical services in the Lateri Public health center while from 63 further educated respondents there are 51 respondents (81%) Who utilize the Prolanis service in the Lateri Public health Center and 12 respondents (19%) Who undertakes the Prolanis service at Public health centers. Statistical test results using the chi-square test obtained the value P = 0.002, due to the value of p < 0.05 then there is an education level relationship to the utilization of the Ministry of Prolanis patient in the lateri health center of Post Earthquake.

Based on the marital status indicates that of 53 respondents who are married, there are 43 respondents (81.1%) That utilize the Prolanis health services in the Lateri Public Health center well and 10 respondents (18.9%) Who is less utilizing the medical service in the Lateri Public Health Center while the 16 respondents who are not married or divorced/widowed there are 11 respondents (68.8%) Who utilize the Prolanis service in the Lateri Public health Center and 5 respondents (31.2%) Who undertakes the Prolanis service at Public health centers. Statistical test results using the chi-square test obtained the value P = 0.006, due to the value of p < 0.05 then there is a marital status relationship to the utilization of the service of the patient in the post-Earthquake Department center.

## Discussion

**Age relationship with the use of Prolanis patient service**

Based on adult category age, there are 23 respondents (71.9%) That utilize the Prolanis health services in the Lateri Public Health center well and 9 respondents (28.1%) Who undertakes the use of medical services in the Lateri Public health center while from 37 respondents grouped by elderly there are 31 respondents (83.8%) Who utilize the Prolanis service in the Lateri Public health Center and 6 respondents (16.2%) Who undertakes the Prolanis service at the Public Health

center of Post-earthquake. This research is not in line with Jenry et al, 2017 which indicates there is age relationship with the utilization of Public health Center service with value P = 0.004.[4] The research conducted by Kim & Hong stating that the age level does not affect the level of utilization of health care for the elderly with or without chronic illness[5]

**Gender relations with the use of Prolanis patient services**

Gender can influence in decision making to conduct treatment search. 8 This is because women need special health services such as pregnancy health services and specific diseases that require women to utilize health care. Another study mentions that gender does not affect people to be able to use health care services. Both men and women have the same risk utilizing health services[6]. The results of the above studies show that Bivariate was obtained from 69 respondents, consisting of 53 female respondents and 16 male respondents. According to the table above, it can be seen that the utilization of Prolanis in post Earthquake Community Health center is dominated by female gender. One of the factors that make the utilization rate of Prolanis dominated by female types. Statistical test results using chi-square indicate a value of P = 0.00 which means the gender relates significantly to the utilization of the prolanis patient in the Lateri public health centers of post-earthquake. The results of research research of Risman et al (2020) which shows that female gender is more utilizing the Ministry of Prolanis in health services UPT Unpad compared to male gender.[7]

**The establishment of a relationship with Prolanis patient service**

The status of education is closely related to the awareness and knowledge of one, so that the status of education has a significant influence on the utilization of healthcare services. Usually low-educated communities, lacking awareness and good knowledge of the benefits of healthcare services[8]

This research shows the educational variables related to the utilization of Prolanis services in the Public health center post-earthquake leteri with a value of P = 0.001 < 0.05. This is in line with the results of the research of Napirah which shows there is a relationship level of education with the utilization of health care in the working area of community health centers of East Coast Poso District of Poso Regency.[9]

**Marital Status relationship with the use of Prolanis patient service**

Marital Status can improve health for individuals with chronic diseases.[10-12]. The majority of Prolanis patient in the Lateri health center are married. A total of 53 Prolanis patient were married to utilize the Ministry of Prolanis. According to Riaz et All arital status is one of the factors that can control the patient's condition in his chronically-controlled disease management efforts[13-17]. This research is in line with the Syafa'at et al, 2019 indicates there is a influence of marital status (P = 0,015) on the utilization of Prolanis in FKTP Depok[11]. Couples or families can be a figure that can help the disease management process. It is not in accordance with the research which et all (2018) that there is no relationship between the status of married than that is not P = 0738. 5

## Conclusion

The study concluded that there is no age relation to the utilization of Prolanis services in post-earthquake community health centres (P = 0,271) However, there are gender relations (0.000), education (P = 002), and marital status (P = 0,006). Therefore, the Lateri Public health center can play an active role and reach out to Prolanis patient who utilize the post-occurrence service of the earthquake so that it can maintain and improve the degree of health especially in people with chronic diseases such as hypotensions and diabetes mellitus.

**Sourve of Funding :** Self

**Conflict of Ineterst :** Nil

**Ethical Clearance :** Obtained from the University Ethical clearance committee

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# The Effect of Work Discipline on a Employee Performance
## (The Health Office Case Study of Tanimbar Island)

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### Abstract

Employee performance is paramount in achieving goals. Employees will achieve work when they have the discipline and motivation to perform their job well. The purpose of this research is to analyze the effect of work discipline on the performance of employees of the Tanimbar islands district health office. This research uses a type of quantitative research and cross-sectional design. Data collection is done by observation, questionnaire, and document study. The samples in this study were 61 officers of the Health office of the Tanimbar Islands regency. A sampling of this research used total sampling. The collected data is processed using the Statistical Package for the Social Sciences program. The results showed the value of P = 0,537 means that there is no influence between the work discipline to the performance of employees of the District Health Office of Tanimbar Islands. Therefore, the health office of the Tanimbar Islands District needs to discipline employees through a better surveillance process.

***Keywords**: Work discipline, Performance, Employee, Health office*

### Introduction

Employee performance is paramount in achieving goals. Employees will achieve work when they have the discipline and motivation to perform their job well. It is the duty of a leader to apply working discipline and to motivate his subordinates in order to work in accordance with the intended purpose. Therefore, the leader must know the factors that affect the motivation of employee work so that employees ' performance increases. With high discipline and motivation, employees will perform their best tasks, so that the objectives that want to be achieved according to the plan. If a leader is unable to engage the discipline and motivation of employee work, the employee's performance will be decreased[1].

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In achieving the success of an employee performance organization is a determining success in achieving its objectives. Good organizational performance is indispensable for realizing the vision and mission of an organization in the future. To get a performance assessment for employees need to be performed a performance evaluation called by performance assessment or performance appraisal[2].

From the initial survey conducted at the Health office of the Tanimbar Islands, it can be noted that employees ' performance in the Health service department is still less good and affects the quality of work. It can be seen less accuracy in the completion of the instructed work so that the time needed in the completion of the work is getting longer. Another thing that we often find in the administration of the establishment and in other areas of duty is very slow in solving problems that occur in the field, one of which often lose mail on the subject of the letter is much needed to be archived to the service. Based on the explanation of the problem above how important

role of working discipline in improving employee's performance.

## Materials and Method

The type of research used is quantitative research with Cross Sectional Study Draft. The population in this research is the overall employee who works in the Tanimbar Islands Health Office (PNS, CPNS, and PPPK) does not include cleaning service and security as much as 61 people. The sampling technique in this study was used in total sampling where the number of samples was equal to the population. Data collection is obtained through interviews using data processing questionnaires conducted in computerised by using SPSS program. Data presented in narrative form, frequency distribution table accompanied by interpretation.

## Results

The results showed the value of P = 0,537 means that there is no influence between the work discipline to the performance of employees of the District Health Office of Tanimbar Islands. Some results are presented in the tables below:

**Table 1. Distribution of Respondents Based on Characteristics of Respondents Health Office Tanimbar Islands in 2020**

| Characteristics | Amount (n) | Percent (%) |
|---|---|---|
| d. Age (yr) | | |
| 18-30 | 10 | 16.4 |
| 31-50 | 46 | 75.4 |
| > 50 | 5 | 8.2 |
| Total | 61 | 100.0 |
| e. Gender | | |
| Male | 29 | 47.5 |
| Girl | 32 | 52.5 |
| Total | 61 | 100.0 |
| f. Education | | |
| High school | 11 | 18.0 |
| Diploma | 19 | 31.1 |
| Bachelor degree) | 28 | 45.9 |
| Masters (S2) | 3 | 4.9 |
| Total | 61 | 100.0 |
| g. Years of service | | |
| <6 years old | 5 | 8.2 |
| 6-10 years | 18 | 29.5 |
| > 10 | 3 | 62.3 |
| Total | 61 | 100.0 |

Source: Primary Data, 2020

**Table 2: Variable Frequency Distribution of Work Discipline in the District Health Office. Tanimbar Islands in 2020**

| The performance | Amount (n) | Percent (%) |
|---|---|---|
| Not good | 41 | 67.2 |
| Good | 20 | 32.8 |
| Total | 61 | 100.0 |

Source: Primary Data, 2020

Table 2 shows that of the 61 respondents, there were 41 respondents with poor work discipline at 67.2 and 20 respondents with good work discipline at 32.8%.

The effect of work discipline on Employee Performance

The bivariate relationship between work discipline and the performance of the Tanimbar Islands District Health Office employees can be seen in table 3 as follows

**Table 3: The effect of work discipline on the Performance of the District Health Office. Tanimbar Islands in 2020**

| Work Discipline | Employee Performance | | | | amount | | Statistic test |
|---|---|---|---|---|---|---|---|
| | Not good | | Good | | | | |
| | n | % | n | % | n | % | |
| Not good | 32 | 52.5 | 14 | 23.0 | 46 | 75.4 | ***p*= 0.537** |
| Good | 9 | 14.8 | 6 | 9.8 | 15 | 24.6 | |
| **Total** | **41** | **67.2** | **20** | **32.8** | **61** | **100** | |

Source: Primary Data, 2020

Table 3 shows that of the 15 respondents with a good working discipline of 6 respondents who have a good performance (9.8%) and 9 Respondents had poor performance (14.8%). While for poor working discipline amounted to 46 respondents as many as 14 respondents had a good performance (23.0%) And 32 respondents had poor performance (52.5%). Statistical test result by using Chi-square, but the chi-square test requirement is not fulfilled, then the value seen is the value of Fisher's exact value P = 0,537, because the value p > 0.05, then H0 accepted. This indicates that there is no influence between working discipline and employee performance at the Tanimbar Islands Health Office.

## Discussion

One form of measuring the performance of a good employee is to look at the discipline at work time. Time discipline here is interpreted as attitudes or behaviors that demonstrate adherence to working hours that includes the attendance and compliance of officers during working hours, employees perform tasks on time and right. It's supposed to work time discipline is applied based on consciousness to complete each job[3].

The work discipline in this research is the effort to carry out its work activities in earnest (timely, obedient rules, according to the responsibilities given). The results of the analysis in table 3 showed that out of a total of 15 respondents with a good category of working discipline more respondents had less than 9 respondents (14.8%). Meanwhile, from a total of 46 respondents with a less well-categorized working discipline, more respondents had a less than good performance amounting to 32 respondents (52.5%). This is because there are certain points that tend not to be performed properly.

Statistical test result by using Chi-square, but the chi-square test requirement is not fulfilled, then the value seen is the value of Fisher's exact value P = 0,537, because the value p > 0.05, then H0 accepted. This indicates that there is no relationship between working discipline and employee performance at the Tanimbar Islands District Health Office. The less-than-good working discipline reflects the lack of a person's responsibility for the task given to him. It is also evidenced by the many officers stating that they always come on time. Thus it can be concluded that it is about time discipline on the district health Tanimbar less good Research is not in line with the research conducted by Kasim et al., about the relationship of work discipline, leadership, training, and motivation to the performance of administration officers Abepura Papua Hospital in 2015[4]. One of the results of his research is the relationship between working discipline to the performance of the administrative officer of the Government Abepura Papua year 2015. The results of this study were not in line with research Panuluh and Gilang stating that discipline has a significant influence on work productivity[5-10].

This research is also not in line with research Satria and Nio (2019) about the relationship of work discipline with the performance of the employees of PDAM Tirta Jam Gadang Bukittinggi[6]. The working discipline indicator measured in the study is attendance, adherence to employment, adherence to working standards, high level of vigilance, and ethical work indicating a significant positive relationship between working discipline and performance in the employees of PDAM Tirta Jam Gadang, Bukittinggi City. That means the higher the employee's work discipline, the higher the performance of an employee. However, this research is in line with the conducted shows the simultaneous and partial work discipline has no effect on the employee's performance[11-17].

## Conclusion

The study concluded that there was no influence between working discipline and employee performance at the Tanimbar Islands Health Office with the value P = 0,537. District Health Office of Tanimbar Islands need to improve employee discipline through better supervision process.

**Ethical Clearance**- Taken fromUniversity ethical clearence committee

**Source of Funding**- Self

**Conflict of Interest** – Nil

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# Analysis Health Information Systems Quality on the Effectiveness of Public Health Center Officers in Ambon City

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## Abstract

Health information systems play a role in providing data, information and health indicators to support the management process will have an impact on increasing the effectiveness of work. The purpose of this research is to know the quality influence of health information system that is seen from availability, timeliness, and relevance to the effectiveness of employees of public health centers in Ambon City. The type of research used is quantitative with cross sectional study design. The population in this study is all employees of the Ambon City Public Health Center amounting to 586 people, the withdrawal of samples with purposive technique obtained by 50 people. Collection of data through questionnaires. Data is analyzed by chi-square test. The results showed that the health information system of the availability aspect (P = 0.02), timely (P = 0.01) and relevant (P = 0.04) significantly affected the effectiveness of healthcare personnel working in the Public health center in Ambon city. It is hoped that the public health center in Ambon City can improve the existing system so that the information produced is more quality.

***Key Words:*** *Health information System, availability, and health care management.*

## Introduction

Efforts in the implementation of health development are all components of the nation that have been arranged in a system called the National Health System (NHS). Its components consist of seven subsystems, one of them about management, information and health regulations. To ensure the achievement of national development objectives of health system is a manifestation and implementation method of health development that combines various efforts of Indonesian nation in a single step [1].

Health information systems can integrate data collection, reporting, processing and use of information to improve the efficiency and effectiveness of healthcare through good management at all levels of health in the central, provincial, Regency/city or even at the level of technical implementation such as hospitals and public health centers[2].

Public health centers as the lowest health executor have difficulty in reporting, where data between one report from one program with another report from other programs has almost the same data set. On the other hand, the application to make various reports is different, causing overlap in its workmanship, it takes a system of information [3].

In the implementation of generic SIKDA for the Maluku province as many as 26 public health centers and 22 public health centers in Ambon City must develop a computer-based health information system in the hope that the data and information produced can be integrated so that the efficiency and effectiveness of the work increases. Based on data from employees work in the Community Health center in Ambon in 2019 repeated errors, the default standard of the report is not used, the delay of information (report) in the form of data (achievement/target) program needed in the creation of public health center profile. Looking at the background

picture researchers want to know the implementation of regional health Information System application (SIKDA) generic Public health center in Ambon City.

## Materials and Method

This research uses quantitative research methods of cross-sectional study design. The population in this study was all employees of the public health centers in Ambon city, amounting to 586 people. The sample is determined by purposive method. Sample criteria is the employee who served in the Community Health center in Ambon city that has participated in the training of regional Health information system (SIKDA generic) amounting to 50 people. Data collection is obtained through a live interview using a questionnaire.

## Result

Based on table 1 shows that the most recent education of respondents was D III with 22 respondents (44.0%) while the least were D I and D IV, each with 1 respondent (2%). The length of service is the length of time the respondent has been working since he was an employee. Table 1 shows that the length of service for most respondents 1-10 years was 34 respondents (68.0%), while those with a minimum of 21-30 years were 2 respondents (4.0%). Most of the respondents' gender was 43 respondents (86.0%), while men were 7 respondents (14.0%). The highest age group of respondents is 31-40 years with 22 respondents (44.0%), the least is 41-50 years, with 2 respondents (4%).

**Table 1: Frequency Distribution of Characteristics of Respondents in Ambon City community health centers in 2020**

| **Characteristics of Respondents** | **Category** | **total** | |
|---|---|---|---|
| | | **N = 50%** | |
| Gender | Male<br>Girl | 7<br>43 | 14.0<br>86.0 |
| Age<br>(Year) | 21-30<br>31-40<br>41-50<br>51-60 | 21<br>22<br>2<br>5 | 42.0<br>44.0<br>4.0<br>10.0 |
| Education | High school<br>D I<br>D III<br>D IV<br>S1<br>S2 | 3<br>1<br>22<br>1<br>20<br>3 | 6.0<br>2.0<br>44.0<br>2.0<br>40<br>6.0 |
| Old Service | 1-10 years<br>11-20 years<br>21-30 years<br>31-40 years | 34<br>9<br>2<br>5 | 68.0<br>18.0<br>4.0<br>10.0 |

*Source:Primary Data, 2020*

**Table 2: Effect of Information Availability, timeliness and relevance information on Employee Work Effectiveness in Ambon City community health centers in 2020**

| Research variable | Work Effectiveness | | | | total | | p |
|---|---|---|---|---|---|---|---|
| | Ineffective | | Ineffective | | | | |
| | n | % | n | % | N | % | |
| **Information Availability** | | | | | | | |
| Available | 34 | 81 | 8 | 19.0 | 42 | 100.0 | 0.021 |
| Not available | 3 | 37.5 | 5 | 62.5 | 8 | 100.0 | |
| total | 37 | 74 | 13 | 26 | 50 | 100.0 | |
| **timeliness** | | | | | | | |
| On time | 33 | 82.5 | 7 | 17.5 | 40 | 100.0 | 0.012 |
| Not on time | 4 | 40 | 6 | 60 | 10 | 100.0 | |
| total | 37 | 74 | 13 | 26 | 50 | 100.0 | |
| Relevance | | | | | | | |
| Enough | 31 | 81.5 | 7 | 18.5 | 38 | 100.0 | 0.040 |
| Less | 6 | 50 | 6 | 50 | 12 | 100.0 | |
| total | 37 | 74 | 13 | 26 | 50 | 100.0 | |

Source: Primary Data, 2020

Table 2 shows that out of 50 respondents the variable Availability of Information and work is effective, as many as 34 respondents (81.0%) information is available and ineffective in their work, as many as 8 respondents (19%). While respondents who stated the unavailability of information but were effective were as many as 3 respondents (37.5%) who stated that no information was available and ineffective as many as 5 respondents (62.6%). Based on the results of hypothesis testing using Chi-Square obtained p-value (0.02) <a (0.05), proving that statistically H0 is rejected, which means there is an influence of the availability of information on the Work Effectiveness of Employees of public health centers in Ambon City in 2020.

Based on the timeliness variable table 2 shows that of the 50 respondents the information variables were timely and effective at work as many as 33 respondents (82.5%) and those whose information was less timely and ineffective were as many as 7 respondents (17.5%). While information that is less timely and effective in their work is 4 respondents (40%) and information that is less timely and ineffective in their work is 6 respondents (60%). Based on the results of hypothesis testing using Chi-Square obtained p-value (0.01) <a (0.05), which means that statistically H0 is rejected, meaning that there is an effect of timely information on the Work Effectiveness of Employees of public health centers in Ambon City in 2020.

Based on the Relevance variable table 2 shows that of the 50 respondents the variables are quite relevant and effective as many as 31 respondents (81.5%) and the less relevant and ineffective that is as many as 7 respondents

(18.5%). While respondents who stated less relevant and effective were 6 respondents (50%) who were less relevant and ineffective as many as 6 respondents (50%). Based on the results of hypothesis testing using Chi-Square obtained p-value (0.04) <a (0.05), which means that statistically, H0 is rejected, which means that there is a Relevant Information effect on the Work Effectiveness of Employees of public health centers in Ambon City in 2020.

## Discussion

**The effect of health information system (HIS) availability towards effectiveness of public health center officers**

Based on the results the study showed that 58% of respondents expressed employee work in the Public health center quite effectively. From these results can be noted that the availability of information is assessed reasonably available by health officers. Where every time needed information can be easily obtained. The results also show that the availability of information has a meaningful influence with the effectiveness of employee performance in the Health center in Ambon city. This suggests that the hypothesis is acceptable. This is accordance with the research by Hariana (2013) who conducted research in 66 hospitals in Yogyakarta, where the results obtained showed that between the availability of information system in the hospital with the value of use of information system for management function in the hospital there is a meaningful relationship. The availability of information systems provides comprehensive support for patient development and service [4].

Report/Data that has been recapitulated directly by the officers from the Public health Center to the health office in the form of hardcopy/photocopy. Data transmission from the Public health center of Ambon to the city health office of Ambon can not be sent online still in the form of hardcopy, sometimes also photocopy ". The results of the research conducted by Wijaya (2011), the format of data transmission in the Public health center Tawang also still manually, the form of print out is already determined from the center, the shipment was not directly sent to the national Data Bank but instead sent to the city health office. But for the management of data already use the computer only for the online system of public health center is still constrained because of the absence of adequate Internet network. Given the importance of computers in the SIK process to procure computers in every public health center in certain areas[5].

**The Effect of the timeliness health information system on the work effectiveness of public health center employees**

the results indicate that timely information was judged to be timely enough by health workers. This may be influenced by reports of patient data reconciliation that is always collected after the completion of service hours. So that the information is always on time and can be used by health workers. The results also showed that timely information has a significant effect on the work effectiveness of employees at the Ambon City community health center. This shows that the hypothesis was accepted. The results of this study are in line with research conducted by Wekesa (2014) who did research in looking at the utilization of health management information systems in Kenya where the results obtained from 196 respondents 126 showed satisfaction with the timeliness of the systems they use. Timeliness refers to the data that is available on time to make the necessary decisions. More than half of community health workers in Kenya report that available data are always timely and they are able to make decisions based on the data they collect [6].

The result was also strengthened by an interview with one of the health officers in the Community Health center in Ambon city, who mentioned that the existing system was able to provide timely information. The reports are also timely because each section has been responsible for each.

**The effect of health information system (HIS) relevance effectiveness of public**

**Health Care Officers**

From the results of the research that has been showed that of the 50 respondents variables are quite relevant and effective, as many as 31 respondents (81.5%) and those that are less relevant and ineffective, as many as 7 respondents (18.5%). From these results it can be seen that the relevant HIS is considered quite relevant by health workers. The results also show that relevant

HIS has a significant influence on the work effectiveness of employees at Ambon City community health centers. This shows that the hypothesis is accepted. According to Nuraida information is considered relevant if the information is related to the needs of decision making. That is, the information received must be relevant to the problem [7].

The results of other research by Lestari also show the same results where the information produced is relevant to the needs of management. The form of information provided to the management must be appropriate, precise and detailed so that it can support the management process in making effective decisions [8]. Similar research was also conducted by Chaulagai et al. To see the quality of information system in Srilangka, which shows that 84% of respondents expressed satisfaction in the information of the relevant aspects of information systems. Relevant information is very useful in the decision making of health care management to set decision [9-17].

## Conclusion

The research concluded that the effectiveness of employees at the Health center in Ambon city is influenced by the availability factor and will be better if the necessary information infrastructure is available. Information or data that required timeliness of its inputs have an influence on the effectiveness of employees of public health centers in Ambon City. The relevance aspect affects both the effectiveness of the employees of the Health center in Ambon city.

**Ethical Clearance**- Taken from University ethical committee

**Source of Funding-** Self

**Conflict of Interest**– Nil

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# Juvenile Treatment Model according to Juvenile Criminal Justice System in the LPKA (Juvenile Detention Center) Class I, Tanjung Gusta, Medan

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## Abstract

Law No. 11/2012 on the Juvenile Criminal Justice System states that child prisoners in the LPKA (Juvenile Detention Center) are required to participate in the treatment program which consists of personal treatment and independency treatment so that they can come back to their communities well; besides that, they have been prepared with skills. The research problem was how about the treatment model of juveniles who have committed criminal offenses in the LPKA Class 1, Tanjung Gusta, Medan. It is expected that through this research a treatment model of juveniles who have committed criminal offenses in the LPKA can be found in the future. The research used normative and empirical approaches. The data were gathered by conducting interviews with some informants in the Section of Juvenile Treatment of the LPKA Class 1, Tanjung Gusta, Medan, and with the child prisoners. The result of the research showed that personal treatment and independency treatment in the LPKA Class 1, Tanjung Gusta, Medan, were performed with group (classial) and scheduled treatment models. It is recommended that individual treatment model, especially independency treatment be used in the future, and personal treatment should be done by using classial treatment model.

***Keywords:*** *Model, Juvenile Treatment, LPKA, Tanjung Gusta*

## Introduction

Law No. 11/2012 on the Juvenile Criminal Justice states that a juvenile who has committed a criminal offense cannot be incarcerated because putting him in prison will not cope with the conflict. On the other hand, it will affect his mental and psychological condition. It is not impossible that he is is not deterrent and will commit the same crime again. This law is the amendments of the system of punishing juveniles. One of them is the special Juvenile Detention Center which called in Indonesian, LPKA (Juvenile Detention Center). The juveniles, who have committed criminal offenses and become the prisoners at the LPKA, are required to participate in the treatment program which consists of personal treatment and independency treatment.

Article 1, point1of Law No. 12/1995 on Penitentiary states that in a criminal justice system, a Penitentiary, in its activity to develop prisoners based on system, institution, and the treatment method, is the last part of the punishing system in the criminal justice system. Therefore, the essence of penitentiary is the treatment toward prisoners so that they can come back to their communities in good condition. The treatment is done in an integrated way among the patron, the prisoners, and the society to increase the quality of the prisoners so that the prisoners will be aware of their wrong doing, improve their quality of life, and not commit their criminal offenses again.

According to the theory of treatment, the objective of the imprisonment is to change prisoners' behavior/ personality so that they will abandon their bad habit which is contrary to legal norms and other norms and to make them inclined to obey the applicable norms. The theory of treatment is more directed toward prisoners' improvement, not toward their criminal offenses. Basically, it is intended to change their attitude toward the better one, and they do not commit their crime again so that they will be accepted by their communities.[1]

The research conducted by Asri Rima Jiwantari, et.al.[2] states that the activity of treatment for child prisoners involves collaboration with the foundation and LSM (Non-Government Organizations). Because of the lack of budget, the implementation of treatment program cannot be done maximally according to the work plan. Alden Juneidy Simanjuntak[3] in his research points out that treatment for child prisoners has some obstacles, due to the lack of competent experts in handling juvenile problems so that child prisoners cannot be treated seriously.

The result of the research conducted by S.K. Sembiring[4] on the Treatment System of Child Prisoners in the LPKA Class 1,Tanjung Gusta, Medan, states that the number of child prisoners in the LPKA Class 1, Tanjung Gusta, Medan, was fluctuating in the last 3 (three) years. There were 510 of child prisoners in 2017, 500 child prisoners in 2017, and the number increased to 587 in 2018. Even though the treatment system has been done, it is not effective, due to over-capacity, lack of facilities and infrastructure, and the shortage of budget and LPKA personnel.

The research problems were how about the treatment model for child prisoners in the LPKA Class 1, Tanjung Gusta, Medan and how to find a treatment model for child prisoners who have committed criminal offenses in the LPKA Class 1, Tanjung Gusta, Medan, in the future.

## Research Method

The research was conducted in the LPKA Class 1, Tanjung Gusta, Medan. It used both normative and empirical methods.[5] The analysis was on the imposition of Law No.11/2012 on the Juvenile Criminal Justice System. Empirical research was done by conducting qualitative study. The data were gathered by conducting interviews with some informants in the Juvenile Treatment Section and with the child prisoners in the Penitentiary.

## Result And Discussion

1. The Treatment for Juveniles Committing Criminal Offenses in the LPKA

The LPKA Class I, Tanjung Gusta, Medan, is located on Jalan Pemasyarakatan, Kelurahan Tanjung Gusta, Kecamatan Medan Helvetia, Medan. It is situated on the area of 19,800 square meters with the building area of 475.47 square meters. Its facility and infrastructure consist of a two-story building with 60 (sixty) detention rooms. From the data

obtained from the Registration and Classification Sub-Section of LPKA Class I, Tanjung Gusta, Medan, until September, 2019, it had been found that of the 160 child prisoners, 68 of them committed drug abuse, 48 of them were involved in juvenile delinquency included in child protection, 16 of them committed robbery, 15 of them were thieves, and the rest of them committed fraud, embezzlement, and sexual harassment.

The treatment system in the LPKA (Juvenile Detention Center), now based on Law on the Juvenile Criminal Justice System, is based on the *Reglement Gevangenis Reklasering.* It has been amended to the Circle Letter of the Minister of Justice of the Republic of Indonesia No. KP.10.13/3/1 on February 8, 1990 on Penitentiary as a process and to the Decree of the Minister of Justice No M..02.PK.04.10/1990 on the Treatment Pattern for Prisoners or Detainees.

The treatment which is done in the LPKA Class I, Tanjung Gusta, which is in accordance with the Decree of the Minister of Justice No. M..02.PK.04.10/1990 on the Pattern of Prisoner Treatment, consists of personality treatment and independency treatment.

1. Personality treatment

The personality treatment includes awareness of having a religion, being in the frame-

work of a nation and a state, intellectual capacity, having a sense of justice, integrating

oneself with a community, and physical treatment. The detail of them is as follows:

a. The treatment of awareness of having a religion: this treatment is done to strengthen child prisoners' belief by providing understanding for them so that they will be aware of the consequences of their actions, whether they are right or wrong. For child prisoners who are Moslems, the activities are done through *Pesantren*

(Islamic Boarding Schools), *Yasinan* (reciting the Surah in the Koran together) and *tahlilan* (praise to God by repeating His name) together, the Koran murottal studying, Islamic counseling, praying together, followed by religious lectures, collaborating with Yayasan AS-Showah Mari Taqwa Medan, Yayasan Insentif Agama Islam (OPIAI) Medan. For child prisoners who are Christians, the activities are done by collaborating with DGKI (Indonesian Council of Churches), STT Abdi Sabda,and KMK USU, while for the child prisoners who are Buddhists, the activities are done through guidance and counseling by collaborating with Majelis Budhayana Indonesia (MBI), Medan.

b. The Treatment of Being in the Framework of a Nation and a State

The treatment of being in the framework of a nation and a state is done through the child prisoners' participation in flag ceremonies in the national holidays performed with the Special Juvenile Treatment Institution. The child prisoners are also participated in the competition of marches and parades (Boy Scouts) organized by the Medan Municipality.

c. The Treatment of Intellectual Capacity

The treatment of intellectual capacity is highly needed in order to increase child prisoners' knowledge and thinking capacity which are needed to support their positive activities during their detention period. The type of education organized in the LPKA Class I, Tanjung Gusta, Medan, is a non-formal education. It is an equivalency education (Package A, Package B, and Package C), collaborating with the Education Agency and PKBM Puspa Private Education as the organizers of equivalency education. The whole program is carried out by qualified private teachers from PKBM Puspa and by the LPKA personnel.

d. The treatment of the Sense of Justice

The implementation of the treatment of the sense of justice is carried out by making

collaboration with the Law Department Regional Office and HAM (Human Rights)

of North Sumatera and with Legal Aid Institutions.

e. The Treatment of Self-Integration to Community

The treatment of social problems is intended to help child prisoners adapt to the communities and neighborhood well. Therefore, to achieve this goal the child prisoners should continuously be adhered to perform their religious duties and can do social activities by doing community services in cleaning up their block surroundings, assimilation program, either in the inside or in the outside penitentiary.

f. Physical Treatment

The physical treatment is done by doing sport such as gymnastics, soccer, volleyball, badminton, ping-pong, and chess. All sports facilities are provided in the LPKA, and they are carried out in an integrated way, according to the daily activity program.

2. Independency Treatment

The independency treatment is directed toward skills in order that child prisoners can

play their role actively in the society. The types of this treatment are as follows: a) skill intended to support handicraft businesses, b) skill in craftsmanship, c) skill in hairdressers, d) wood craftsmanship, e) sewing, f) welding, and g) training in painting.

Personality treatment and independency treatment in the LPKA Class I, Tanjung Gusta, Medan, are done in an integrated way. Personality treatment is implemented by using the model of classial treatment by conducting lectures, questions and answers, simulation, role-play, or team establishment while independency treatment is implemented and adjusted to the available facilities in the LPKA Class I, Tanjung Gusta. Unfortunately, it lacks of attention to the child prisoners' interest and talent.

2. Treatment Model of Juveniles as Child Prisoners in the LPKA in the Future

Gordon Bazemore, in his writing, *Three Paradigms of Justice*, in Paulus Hadisuprapto,[6] introduces three types or models of juvenile criminal justice: 1) individual treatment model, 2) retributive model, and 3) restorative model. The research conducted by Fanny Tanuwijaya[7] proposes five methods of the treatment for child prisoners: 1) situational treatment, 2) individual treatment, 3) classial treatment, 4) experimental learning,

and 5) auto suggestive.

Individual treatment model and retributive model in the model of juvenile criminal justice has single dimension and its control is oriented to an individual juvenile who commits crime. In this case, it does not involve the interest of the victims and other people. In its practice, individual treatment model uses therapeutic approach. The perpetrator is treated like a sick child whose sickness is being diagnosed. After the diagnosis has been found out, the appropriate therapy is determined according to the type of the sickness. The treatment toward a child prisoner should be in accordance with the cause while the treatment for independency should be adjusted to his interest and talent.

Individual treatment model in the European countries is known as juvenile justice model which considers that juvenile delinquency is not considered or expected in the level of values; it tends to be considered as the dysfunction of socialization. Intervention is an effort to improve a social deviation behavior by imposing a sanction on the personal problems and needs of a juvenile who commits a crime.

Classial treatment is done by providing lectures, questions and answers, simulation, role-play, and team establishment. The group should be active, either individually or in groups. The materials and the methods of treatment should involve the entire group in order to achieve the target. In this model, the patron should be able to motivate the juveniles to understand positive values which exist in the society or in the group as the materials of the treatment.

From the treatment models for juveniles above, it is found that each model has its advantages and disadvantages. Treatment model by using classial model, for example, has its own advantages such as the understanding, interest, and talent of juveniles who commit crime are different one to another so that the treatment, as a whole, cannot be absorbed and favored by the child prisoners. In consequence, the treatment done in the LPKA is merely ceremonial. Individual treatment has disadvantage since its cost and instructors' fee are high, it needs so many personnel who have to have special scientific specification.

Treatment models for child prisoners in the LPKA in the future should use individual treatment, especially in the treatment for independency because every juvenile who commits crime has his own social problem, economic problem, interest, and talent so that independency treatment is more appropriate for him. Besides that, the skills he has mastered during the detention period in the LPKA can be applied in his daily life, whereas personality treatment can be done by using classial treatment.

Individual treatment takes a lot of money in its implementation; however, if it is viewed from its advantages and its long term financing, budgeting for the treatment process of can be more beneficial and economical, compared with the cost spent for child prisoners without adequate treatment process.[8]-15

## Conclusion

Treatment for juveniles who have committed crimes in the LPKA Class I, Tanjung Gusta, Medan is done by using classial treatment, either in personality treatment or in independency treatment. Personality treatment includes treatment in having a religion, being in the framework of a nation and a state, intellectual treatment, having a sense of justice, integrating oneself with a community, and physical treatment. Independency treatment is done by providing skill in craftsmanship, skill in hairdressers, wood craftsmanship, sewing, welding, and training in painting. It is recommended that treatment models for child prisoners in the LPKA in the future be done by using individual treatment for independency treatment while personality treatment should be done by using classial treatment.

**Source of Funding:** This research is financed by NON PNBP 2019, the University of Sumatera Utara Number: 4167/UN5.1.R/PPM/2019 on April 1, 2019.

**Conflict of Interest** : None

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# Factors Related to the Existence of Aedes Aegypty Larvae in Endemic and Non Endemic Areas in Makassar City

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## Abstract

This study aims to determine the factors associated with the presence of Aedes aegypti larvae in endemic and nonendemic areas of DHF in Biringkanaya District. The type of research used was observational with cross sectional design and through direct observation. The population is all houses in the Village of Pai and Kelurahan Daya. Determination of the sample was carried out by proportional simple random sampling method in order to obtain a sample of 100 houses each. Data analysis was carried out was univariate and bivariate with chi square test. The results showed that the related variables were the actions of PSN in endemic areas (p = 0.025), water temperature (p = 0.000), house humidity (p = 0.000), container conditions (p = 0.000) in endemic areas and (p = 0.002) in nonendemic areas. Unrelated variables are knowledge (p = 0.141) in endemic areas and (p = 0.824) in nonendemic areas. The conclusion of this study is that there is a relationship between PSN action, water temperature, house humidity, and container conditions with the presence of larvae in endemic areas, but there is no relationship between respondents' knowledge in the two regions and the actions of PSN in nonendemis areas.

***Keywords:*** *Knowledge, action, humidity, temperature, container conditions*

## Introduction

Dengue hemorrhagic fever (DHF) or Dengue Hemorrhagic Fever (DHF) is no longer a foreign disease heard in the ears of the community, internationally, nationally or locally, which is still a public health problem. This disease is almost found in all parts of the world, especially in tropical and subtropical countries, both as an endemic and epidemic disease.[1] Currently, Indonesia ranks highest for dengue cases in the Asian Nations Association (ASEAN). In 2016 there were 204,171 DHF cases with a total of 1,598 deaths.[2] The number of DHF cases in 2016 increased compared to the number of cases in 2015 which was 129,650 cases. The number of deaths due to DHF in 2016 also increased from 2015 (1,071 deaths). Incidence Rate (IR) or the DBD morbidity rate in 2016 also increased from 2015, which was 50.75 to 78.85 per 100,000 population. However, CFR has decreased from 0.83% in 2015 to 0.78% in 2016.[3-5]

Health behavior also determines the level of success in carrying out an activity such as the implementation of prevention or eradication of a source of disease in order to reduce the occurrence of mosquito larvae density.[6] In the case of DHF, the proper method for preventing DHF is the Eradication of Mosquito Nest (PSN) through 3M Plus (Drain, Cover and Bury) plus larvaside sowing, spreading of fish in water reservoirs and other activities that can prevent or eradicate mosquitoes Aedes aegypti breed.[7]

In addition to the factor of clean living behavior, environmental factors are also very influential, especially the physical environment in this case is the temperature, humidity, and condition of the Water Reservoir (TPA). optimum 25-27 ° C, at temperatures below 10 ° C or above 40 ° C growth will stop.9 From this description, researchers intend to conduct research on factors related to the presence of Aedes aegypti larvae in this case are the characteristics of the physical environment (Temperature, humidity, and the condition of the landfill)

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as well as community behavior towards PSN in endemic and nonendemic areas of Makassar City DBD.

## Materials and Method

This research is an observational analytic study with cross sectional study design. This research was conducted in Pai and Biringkanaya sub-districts with a sample of 100 houses in each kelurahan, because the study sample was taken using proportional simple random sampling technique. The data collection process was carried out using a questionnaire to measure the variables of PSN knowledge and actions, an observation sheet to measure air temperature, air humidity, and see the condition of the containers of each house. Data analysis used the Package for Social Science (SPSS) program with the chi-square test and presented in tabular and narrative form.

## Results

1. Relationship Between PSN Knowledge and Larvae

Table 1. Correlation of PSN knowledge with the presence of Aedes aegypti larvae in Endemic Region (Pai Village) and nonendemic area (Daya Village) Biringkanaya District Makassar City

**Table 1 shows that of the 100 respondents in endemic areas (Kelurahan Pai) dominated by respondents who had a lack of knowledge about PSN and there were larvae in their containers as many as 53.7% and respondents who had sufficient knowledge but there were larvae at 63% .**

| Subdistrict | Knowledge | Presence larvae | | | | Total | | p |
|---|---|---|---|---|---|---|---|---|
| | | Present | | Not Present | | | | |
| | | n | % | n | % | n | % | |
| Pai (Endemis) | Lack | 29 | 53,7 | 25 | 46,3 | 54 | 100 | 0,141 |
| | Enough | 17 | 37,0 | 29 | 63,0 | 46 | 100 | |
| Daya (Non Endemis) | Less | 7 | 33,3 | 14 | 66,7 | 21 | 100 | 0,824 |
| | Enough | 22 | 27,8 | 57 | 72,2 | 79 | 100 | |
| | Total | 75 | 37,5 | 125 | 62,5 | 200 | 100 | |

**2. Relationship Between PSN Actions and the Existence of Larvae**

**Table 2. Relationship between PSN actions with the presence of Aedes aegypti larvae in Endemic Areas (Kelurahan Pai) and nonendemic areas (Kelurahan Daya) Biringkanaya District, Makassar City**

| Subdistrict | Action | Presence larvae | | | | Total | | p |
|---|---|---|---|---|---|---|---|---|
| | | Present | | Present | | | | |
| | | n | % | n | % | n | % | |
| Pai (Endemis) | Negative | 34 | 55,7 | 27 | 44,3 | 61 | 100 | 0,025 |
| | Positive | 12 | 30,8 | 27 | 69,2 | 39 | 100 | |
| Daya (Non Endemis) | Negative | 13 | 29,5 | 31 | 70,5 | 44 | 100 | 1,000 |
| | Positive | 16 | 28,6 | 40 | 71,4 | 56 | 100 | |
| | Total | 75 | 36,5 | 125 | 63,5 | 200 | 100 | |

Table 2 shows that out of 100 respondents in endemic areas (Pai Village) were dominated by respondents who had bad actions and there were larvae in their containers at 55.7%. As for the nonendemic area (Kelurahan Daya) of 100 respondents in the area, it was dominated by respondents who had good actions and there were no larvae at 71.4%. Based on the results of the Chi square test found that the value of p = 0.025 for endemic areas and 1,000 for endemic areas.

**3. Relationship between Temperature and the Existence of Larvae**

The temperature measured in this study is the temperature of the water in each container using a mercury thermometer. Temperatures are classified into two categories: potential and non-potential. Potentially categorized if the average water temperature measured is between 23 ° C and 27 ° C and not potential if the average water temperature is <23 ° C or> 27 ° C

**Table 3. Relationship between Water Temperature and the presence of Aedes aegypti larvae in Endemic Region (Pai Village) and Nonendemic Area (Daya Village) Biringkanaya District Makassar City**

| Subdistrict | Category | Subdistrict | | | | Total | | p |
|---|---|---|---|---|---|---|---|---|
| | | Subdistrict | | Subdistrict | | | | |
| | | n | % | n | % | n | % | |
| Pai (Endemis) | Potencial | 39 | 81,3 | 9 | 18,8 | 48 | 100 | 0,000 |
| | Not Potencial | 7 | 13,5 | 45 | 86,5 | 52 | 100 | |
| Daya (Endemis) | Potencial | 23 | 51,1 | 22 | 48,9 | 45 | 100 | 0,000 |
| | Not Potencial | 6 | 10,9 | 49 | 89,1 | 55 | 100 | |
| | Total | 73 | 36,5 | 127 | 63,5 | 200 | 100 | |

Table 3 shows that out of 100 houses in endemic areas (Pai Village) is dominated by houses with no potential water temperature and no larvae in their containers, which is 86.5%. Whereas in nonendemic areas (Kelurahan Daya) out of 100 houses in the area, there are also houses that have no potential water temperature and no larvae, which is 89.1%. Based on the Chi square test results it was found that the value of p = 0,000 for both regions. This indicates that there is a relationship between water temperature and the presence of Aedes aegypti larvae in endemic and nonendemic areas of DHF.

**4. Relationship Between Moisture and the Existence of Larvae**

**Table 4. Relationship between House Humidity and the presence of Aedes aegypti larvae in Endemic Areas (Kelurahan Pai) and Nonendemic Areas (Kelurahan Daya) Biringkanaya District, Makassar City**

| Subdsitrict | Category | Presence larvae | | | | Total | | p |
|---|---|---|---|---|---|---|---|---|
| | | Present | | Present | | | | |
| | | n | % | n | % | n | % | |
| Pai (Endemis) | Potensial | 41 | 59,4 | 28 | 40,6 | 69 | 100 | 0,000 |
| | Not Potensial | 5 | 16,1 | 26 | 83,9 | 31 | 100 | |
| Daya (Non Endemis) | Potensial | 22 | 78,6 | 6 | 21,4 | 28 | 100 | 0,000 |
| | Not Potensial | 7 | 9,7 | 65 | 90,3 | 72 | 100 | |
| | Total | 75 | 36,5 | 125 | 63,5 | 200 | 100 | |

Table 4 shows that out of 100 houses in endemic areas (Pai Village) is dominated by houses that have potential moisture and there are Larvae in their containers, as many as 59.4%. As for nonendemic areas (Kelurahan Daya) out of 100 houses in the area, houses are dominated by potential humidity and no Larvae, which is 90.3%. Based on the results of the Chi square test it was found that the value of p = 0,000 for both regions.

**5. Relationship between Container Conditions and the Presence of Larvae**

**Table 5. Relationship between Container Conditions and the presence of Aedes aegypti larvae in Endemic Areas (Kelurahan Pai) and Nonendemic Areas (Kelurahan Daya) Biringkanaya District, Makassar City**

| Subdistrict | Category | Presence larvae | | | | Total | | p |
|---|---|---|---|---|---|---|---|---|
| | | Present | | Present | | | | |
| | | n | % | n | % | n | % | |
| Pai (Endemis) | Open | 44 | 63,8 | 25 | 36,2 | 69 | 100 | 0,000 |
| | Close | 2 | 6,5 | 29 | 93,5 | 31 | 100 | |
| Daya (Non Endemis) | Open | 25 | 41,0 | 36 | 59,0 | 61 | 100 | 0,002 |
| | Close | 4 | 10,3 | 35 | 89,7 | 39 | 100 | |
| | Total | 75 | 37,5 | 125 | 62,5 | 200 | 100 | |

Table 5 shows that out of 100 houses in endemic areas (Kelurahan Pai) is dominated by houses that have containers in open condition and there are larvae in their containers, which is 63.8%. Whereas in nonendemic areas (Kelurahan Daya) out of 100 houses in the area, dominated by houses that have containers in open condition and no larvae, which is as much as 59.0%.

## Discussion

The presence of Aedes aegypti larvae in an area is an indicator in efforts to control DHF. Monitoring the presence of Aedes aegypti larvae by implementing the Periodic larvae examination (PJB) is very important to assist in conducting an evaluation of threats in each city and so that actions to eradicate mosquitoes can be increased. Analysis of the presence of larvae is carried out by observation using a visual method, which is a survey conducted by seeing the presence or absence of larvae in each place of puddles (containers) without making larvae taking.[10]

For the Knowledge Variable, the results of the study found that of 54 respondents in endemic areas (Pai Village) who had a category of less knowledge about PSN as much as 53.7% in the container contained larvae and 46.3% which did not have larvae. Whereas for respondents who have sufficient knowledge category there are 46 respondents, of whom 37.0% have larvae and 63.0% of houses have no larvae. As for nonendemic areas (Kelurahan Daya) of the 21 respondents who lacked knowledge, 33.3% were positive for larvae and 66.7% for larvae were not found in their containers. Whereas for respondents who have sufficient knowledge category, namely 79 respondents, 27.8% of them have larvae and 72.2% have no larvae. This indicates that although the respondents who have a sufficiently large level of knowledge are 46 respondents (endemic areas) and 79 respondents (nonendemic areas),

there is no relationship between the level of knowledge and the presence of larvae due to the very few houses found by larvae, ie only 17 houses (37%) for endemic areas and 22 houses (27.8%) for nonendemic areas. This can be due to the inconsistency of the level of knowledge with actions which means that although the community does not know the source / place of mosquito breeding and how to eradicate it, 3M or PSN activities are unconsciously always carried out because it is a routine activity in maintaining house cleanliness.

In other words, there is no correlation between the level of knowledge and PSN actions. So, even though housewives have a good level of knowledge or not about the actions of DHF PSN, it is not yet guaranteed that these mothers practice DHF PSN well or vice versa. This is evidenced by the results of in-depth interviews with several respondents, especially those who work as housewives, when they saw the larvae at the water reservoir, they assumed that it was a caterpillar and they immediately cleaned it on the grounds that the water was dirty. But not on the basis of knowledge that the small animal is a larva that will eventually become a mosquito.

Good and Less Knowledge can be influenced by several factors such as information sources and educational factors as well as the environmental sector the more people get information both from the family environment, neighboring environment from health workers and print media will affect one's level of knowledge. Good knowledge is obtained from a good learning process. Thus the cause of the high number of respondents who have unfavorable numbers, one of which is the lack of information that can be received by respondents when getting education. So it can be concluded that respondents who lack knowledge can be improved to be even better, based on observations this could be due to lack community interest to watch, read and listen to matters relating to health services, especially regarding PSN or larva eradication. The results of this study are in line with research conducted by Rochmadina (2018) who also said that there is a relationship between temperature and the presence of Aedes aegypti larvae.[11]

The results of this study are in line with research conducted by Nani (2017) about the relationship of PSN behavior with the existence of Aedes aegypti larvae at Pulang Pisau Port with the results of statistical analysis conducted using Chi square obtained p = 0,000 ($p < \alpha$) meaning that there is a relationship between PSN actions in the presence of Aedes aegypti larva at the Pulang Pisau Port in 2016. These results indicate that endemic and non-endemic areas differ in terms of PSN actions.

In the previous discussion, community knowledge in nonendemic areas was very sufficient in relation to PSN, and that knowledge was actually realized in the form of actions. Community behavior has an influence on the environment because the environment is a land for the development of such behavior. routine and continuous it can prevent the development of Aedes aegypti mosquito larvae and prevent the occurrence of Dengue Hemorrhagic Fever. The temperature of the water in the container is measured using a mercury thermometer. The water temperature measured in each container is then averaged according to the number of containers found in each house and this is classified into two categories: potential and non-potential. Potential categorized if the temperature the average water measured is between 23 ° C to 27 ° C and has no potential if the average water temperature <23 ° C or> 27 ° C. According to the existing theory that, water temperature is one of the factors that can affect the development and survival of Aedes aegypti larvae, the water temperature suitable for the development of Aedes aegypti larvae. One of the environmental parameters that is significantly related to the population density of Aedes aegypti larvae is the water temperature. Water temperature acts as a determinant for larval growth. It was also stated that the growth of mosquitoes would be completely stopped if the temperature is less than 10 ° C or more than 40 ° C. The cause of uniformity in the temperature of water in containers is due to the relatively high ambient temperature at the time of the study because the weather was always hot. The results of this study are in line with research conducted by Asrianti Arifin which also says that there is a relationship between temperature and the presence of Aedes aegypti larvae[10].

The survival of Aedes aegypti the low is more caused by a slow metabolic process due to low temperature and humidity that can result in larval death. Based on this we know that moisture that does not meet the requirements will result in death of larvae, thereby reducing the likelihood of larvae being found. The results of this study

in line with research conducted by Herdianti which also says that there is a relationship between temperature and the presence of Aedes aegypti larvae.[11-12]

## Conclusions

The conclusion of this study is that there is a relationship between PSN actions, water temperature, house humidity, and container conditions with the presence of larvae in endemic areas and yet there is no relationship with respondents' knowledge in the two regions and PSN actions in nonendemic areas.

**Sourve of Funding :** Self

**Conflict of Ineterst :** Nil

**Ethical Clearance:** Obtained from the University Ethical clearance committee

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# Analysis of Cost Sharing on the Satisfaction of NHI Patients Not Contribution Beneficiaries
## (Case Study of Passo Hative Hospital in Ambon City)

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### Abstract

Cost Sharing is a fee payable by the patient participant of the social insurance administration Organization because it gets health services in the hospital which is derived from the reduction in tariffs with the amount of costs incurred by the social insurance administration Organization. Analyse the additional costs that the Passo Hative Hospital has done to patient satisfaction. This type of research is quantitative research by using a cross-sectional design approach. The population in this study is all the patients of the national health care insurance not the recipient of dues \who are being treated at hospitalisation in the Passo Hative Hospital in Ambon City with the last one month visit was 150 patients. The sampling techniques in this study are accidental sampling. The results showed there was an additional cost relationship moving the treatment class to patient satisfaction (P = 0.001). There is a relationship of medical services additional costs to patient satisfaction (P = 0,016) and there is a connection to the additional cost of medication to patient satisfaction (P = 0,000) of the hospital as a service provider of the social insurance administration Organization in order to be more observant to see the cause of the users of the social insurance administration Organization to change the treatment class of the care and fulfill and complement medical services and medicines that are the right of the patient according to the social insurance administration Organization.

***Keywords**: Cost Sharing, Moving classes, medical services, medication, hospital*

### Introduction

Universal health protection or globally known as the term Universal Health Coverage (UHC) aims to provide health care insurance for all residents (health for all). It is necessary to obtain sufficient attention for all stakeholders to ensure better quality of health services and can be achieved in 2030 as a deal for all UN Member States[1].

Strategic purchasing is an activity that includes the provider's relationship to information, such as provider performance or population health needs, aligning funding and revenue to achieve increased efficiency, accountability, service delivery, and equity[2]. The additional cost is the cost of medicines that do not go into the list of the price of the drug, medical services and occupy a treatment class that does not comply with its goals[3].

Outline, the additional costs paid by the participant of the social insurance administration Organization in hospital may be grouped in two, which is Cost Sharing allowed and Cost Sharing not allowed. Cost Sharing are allowed, consisting of a fee due to the grade-up of the care class that is the right (according to presidential decree No. 12/2013 on National Health Insurance Article 24 and PERMENKES RI number 71/2013 on health

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services on National health insurance) and costs due including health services that are not guaranteed. While the Cost Sharing not allowed, that is all that includes the guaranteed health service[4].

Data social insurance administration Organization in Ambon Branch said from 215 complaints against advanced health facilities received in 2018, 69 cases (32%) cost sharing by the advanced healthcare facilities. While the data of the Case-Mix team of the Passo Hative Hospital, in 2018 there are 12 reports of patient complaints regarding the burden of additional charges. To support the fact above, in research that has been conducted, there were 37 of 200 respondents of NHI patients experiencing cost sharing from healthcare providers.

Although the cost sharing may not be made, this issue persists. This can be due to many factors that are quite complex and intertwined. However, there are cost sharing for the participants of the social insurance administration Organization, especially the additional costs that are not allowed, can be due to three aspects of the cause, namely the participant aspect, the hospital aspect and INA Cbg'S aspect itself[4]. The research aims to analyse the additional costs that the Passo Hative hospital has made against patient satisfaction .

## Materials and Methods

The type of research used is quantitative research with the design of Cross-Sectional studies. The population in this study is all the patients of the national health care insurance not the recipient of dues who are being treated at hospitalisation in the Passo Hative Hospital in Ambon City with the last one month visit was 150 patients. The sampling techniques in this study are accidental sampling. Data collection is obtained through a live interview using a questionnaire.

## Result

According to table 1, it is known that the number of respondents who are more than 30-60 years of age is 51 people (46.8%), while the least respondents are in the category age of > 60 Year 8 people (7.3%). According to gender, the number of male respondents was more than 56 people (51.4%), while female respondents were 53 people (48.6%). Based on NHI class the number of respondents who have the right grade II class is more than 46 people (42.2%), while the right grade NHI respondents are the fewest class I is 24 people (22.0%).

**Table 1. Distribution of Respondents Based on Characteristics of Respondents at Hative Passo Hospital in 2020**

| Characteristics of Respondents | Amount (n) | Percent (%) |
|---|---|---|
| h. Age (yr)<br><30<br>30-60<br>> 60 | <br>50<br>51<br>8 | <br>45.9<br>46.8<br>7.3 |
| Total | 109 | 100 |
| i. Gender<br>Male<br>Girl | <br>56<br>53 | <br>51.4<br>48.6 |
| Total | 109 | 100 |
| j. JKN class<br>Grade 3<br>Grade 2<br>Class 1 | <br>39<br>46<br>24 | <br>35.8<br>42.2<br>22 |
| Total | 109 | 100 |

According to table 2, shows that respondents did not charge an cost sharing when moving treatment classes by 87 people (79.8%), while respondents who issued 22 people (20.2%). Based on the cost sharing of medical services showed that respondents did not spend an cost sharing for medical services as much as 99 people (90.8%), while respondents who spent 10 cost sharing (9.2%). Based on the cost sharing of the drug service showed that respondents who did not spend additional costs for the drug service as much as 36 people (33%), while respondents who issued an cost sharing of 73 people (67%). Based on the satisfaction of the patient showed that the respondents were satisfied with the

**Table 2. Distribution of Respondents Based on cost sharing at Hative Passo Hospital 2020**

| **Research variable** | **Amount (n)** | **Percent (%)** |
|---|---|---|
| a. Cost sharing of Moving Care Class | | |
| There is no | 87 | 79.8 |
| There is | 22 | 20.2 |
| Total | 109 | 100 |
| b. Cost sharing of Medical Services | | |
| There is no | 99 | 90.8 |
| There is | 10 | 9.2 |
| Total | 109 | 100 |
| c. Cost sharing of Drug Services | | |
| There is no | 36 | 33 |
| There is | 73 | 67 |
| Total | 109 | 100 |
| d. Patient Satisfaction | | |
| Satisfied | 54 | 49.5 |
| Less satisfied | 55 | 50.5 |
| Total | 109 | 100 |

**Table 3. The Relationship between cost sharing and Satisfaction of NHI Patients Not Recipients of Contribution Aid at Hative Passo Hospital in 2020**

| Research variable | Satisfaction | | | | total | | p |
|---|---|---|---|---|---|---|---|
| | Satisfied | | Less satisfied | | | | |
| | n | % | n | % | N | % | |
| Cost sharing of Transfer Class | | | | | | | |
| There is no | 50 | 45.9 | 37 | 33.9 | 87 | 100 | .001 |
| There is | 4 | 3,7 | 18 | 16.5 | 22 | 100 | |
| Total | 54 | 49.6 | 55 | 50.4 | 109 | 100 | |
| Cost sharing of medical | | | | | | | |
| There is no | 53 | 48.6 | 46 | 42.2 | 99 | 100 | 0.016 |
| There is | 1 | 0.9 | 9 | 8.3 | 10 | 100 | |
| Total | 54 | 49.5 | 55 | 50.5 | 109 | 100 | |
| Cost sharing of drug | | | | | | | |
| There is no | 28 | 25.7 | 8 | 7.3 | 36 | 100 | 0,000 |
| There is | 26 | 239 | 47 | 43.1 | 73 | 100 | |
| Total | 54 | 49.6 | 55 | 40.4 | 109 | 100 | |

Table 3 above can be noted that the number of respondents who do not spend cost sharing when moving treatment room classes or not moving classes of care and feel quite satisfied as much as 50 people (45.9%) And respondents who felt dissatisfied as much as 37 people (33.9%). While respondents who spend cost sharing when moving treatment room classes but still feel satisfied as much as 4 people (3.7%) And respondents who were dissatisfied as much as 18 people (16.5%). Chi Square Statistical test results obtained a value of P = 0.001 or a value of P < 0.05. Thus Ho was rejected and Ha was accepted. This indicates that there is an additional cost incurred by the patient when moving the class of treatment room enough to affect patient satisfaction in the Passo Hative Hospital of Ambon City.

Based on the cost sharing of medical services shows that the number of respondents who did not spend an cost sharing for medical treatment or service and felt quite satisfied as much as 53 people (48.6%) And respondents who felt dissatisfied as much as 46 people (42.2%). While the respondent who issued an cost sharing for medical treatment or service but still satisfied as much as 1 person (0.9%) And respondents who felt less than 9 people (8.3%). Test result Statistics Fisher's Exact Test obtained the value P = 0,016 or the value p < 0.05. Thus Ho was rejected and Ha was accepted. This indicates that there is an cost sharing incurred by the patient when obtaining treatment or other medical services to adequately affect patient satisfaction in the Passo Hative Hospital in Ambon.

Based on the cost sharing of the drug indicates that the number of respondents who did not spend cost sharing for the service or the purchase of the drug and felt enough satisfied as much as 28 people (25.7%) And respondents who felt less than 8 people (7.3%). While respondents who issued cost sharing for the service or the purchase of the drug but remained satisfied as much as 26 people (23.9%) And respondents who felt dissatisfied as much as 47 people (43.1%). Chi Square Statistical test results obtained the value P = 0,000 or the value $p < 0.05$. Thus Ho was rejected and Ha was accepted. This indicates that the presence of cost sharing incurred by the patient for the ministry or purchase of the drug adequately affects patient satisfaction in the Passo Hative Hospital in Ambon City.

## Discussion

**Cost sharing of moving treatment classes to patient satisfaction**

Patients who are up in the treatment class then the cost of a fee is the difference between the requested class fee minus the class fee on his right. Participants may also decide to board the treatment class as a result of a room with full-care class privileges. This could happen when the bed capacity and the need for the existing class are not balanced in a hospital. The number of requests is not always balanced by the availability of appropriate inpatient classrooms.

Customer satisfaction is the level of a person's feelings after comparing the perceived performance (result) compared to his expectations. The measurement of patient satisfaction is much done but difficult to do because of its subjective nature. When the patient decides to board the class, the patient has an expectation of the service and the amount of fees to be paid. When expected expectations do not match the reality, there is dissatisfaction

In the era of national health insurance, the participants can be able to improve the treatment class when hospitalized. Before deciding on choices such as boarding classes, participants also thought about other possibilities such as costly fees, healthcare services and the economic opportunities gained from their choice. The option to move the class can be seen on the number of respondents who moved to the class of 22 people (20.2%). This is relevant to the compulsion of paying. This condition occurs in the state of the inpatient class with full rights. If the treatment class does not meet the expectation and ability of the patient, but the need for health status requires the patient to choose and pay the service[5]. When the patient and his family choose an inpatient class, of course there are various factors that are considered as basic considering benefit and cost. It is in accordance with the theory of rational choice.

**Cost sharing of Medical services to patient satisfaction**

Health care is any effort that is held alone or jointly in an organization to maintain and improve health, prevent and cure diseases and restore the health of individuals, families, groups and communities. The weight or light of hospitalized patients is difficult to predict, so the hospital cannot have patients treated with certain reasons [3]. Due to the heavy weight of disease hospitalized, the heavier the disease suffered by one, the more complex the medical examinations/actions will be performed. This situation poses another consequence of higher cost expenditure. In addition, the light weight of the disease condition provides a different contribution to the amount of unit cost to be spent per day

The results of the study Dassi & Hardi (2019) showed that the participants of social insurance administration Organization so far have more financing assistance in terms of inpatient rates, while drugs and medical actions are still not adequate., because for certain medical action the amount (RP) to be paid by the patient is much greater than that borne by PT. social insurance administration Organization. Cost Sharing costs incurred by the patient in terms of the type of action of RS health officers as much as Rp. 422,000[3]

**Cost sharing of drug services to patient satisfaction**

Drug service is the provision of medicines outside the standard medicine included in the hospital package, which is required for health care in accordance with medical indications and with a ceiling list of drug prices used for participants and their families by the social insurance administration Organization according to the decree of the Minister of Health. As for the medicines included in the ceiling list of drug prices is not a generic

drug, but the medication needed can be administered at a price that meets a specific ceiling list. The selection of drugs conducted by pharmacology and clinical experts, and also conducted analysis of the price aspects of making ceiling list of drug prices which refers to the list of national Essential medicines that have been compiled by the government. This is because the medicines in the list of national Essential medicines are the most needed and absolutely necessary medicines to be held. Some types of drugs that enter the list of national Essential medicines ranging from antibiotics, anti-inflimasi, anti-depressants, antihypertensive, anti-fungal, asthma medication, stomach ulcers to skin medications. The research conducted by Nita et al, 2020 shows the patient satisfaction of the pharmacy ministry in the hospital by 90.9% lower than the pharmacy ministry in the Public health center by 96.6% [6].

Meanwhile, in research conducted by Prastina Prayogi (2018) on the policy study of National Health Insurance Program in Sidoarjo District, stating that with the process that occurred in the implementation of the implementation to several hospitals or health facilities, still shows the service provided has not been fulfilled. There are patients who are denied medication, and there are also additional costs for the drug. It concluded that the lack of response responses between officers on patients, lack of socialization provided by policy organizers and policy executor in terms of information, inspection services and the placement of additional costs to be paid alone[7-12]

## Conclusion

The study concluded that there was an relationship cost sharing moving treatment classes to patient satisfaction (P = 0.001). There is a relationship cost sharing of medical services to patient satisfaction (P = 0,016) and there is a relationship cost sharing of drug service to patient satisfaction (P = 0,000) of Passo Hative hospital as social insurance administration Organization service provider to be more observant to see the cause of social insurance administration Organization users to change treatment class from care class that should be the right, and fulfill and complement medical services and medicines that.

**Sourve of Funding :** Self

**Conflict of Ineterst :** Nil

**Ethical Clearance :** Obtained from the University Ethical clearance committee

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# Estimation of Some Immunological and Biochemical in the Patients with Systemic Lupus Erythematosus in Males and Females in Baghdad

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## Abstract

**Background:** Systemic lupus erythematosus (SLE) is the prototypic multisystem autoimmune disease caused by the mistakenly in the body immune system that attacks healthy tissue in many parts of the body. Autoimmune thyroiditis (AT) is an organic-specific disease associated with production of a variety of antibodies such as antinuclear antibodies, anti-double stranded DNA, anti-Ro antibodies and anti-cardiolipin antibodies.

**Methods:** the study consist of 90 subjects from the both sexes were registered in this study.. The subjects have been divided in to three groups, group one and group two represent the patient groups that include, (30 SLE patients without taking steroid drugs group one (3male-27female) and 30 SLE patients with taking steroid drugs group two (2male-28female) with age range (16-57)years and thirty healthy subjects regards as a control (5male-25female)). Various clinical and laboratory parameters of SLE were measured for each groups. Also thyroid function tests were measured, which included free T3, free T4 and TSH. Antimicrosomal was measured for all groups were estimated by VIDAS method.

**Results:** the results showed thyroid disorders were common (23.33%%) in lupus patients. Hypothyroidism was the commonest (13.33%) abnormality in SLE patients then hyperthyroidism (1.66%). At the same time, the results showed significance decreasing ($p<0.01$) in level of FT3 in (G1 and G2) when compared with the control group. Also, the results showed high significant decrease ($p<0.01$) in level of FT4 in (G2) comparison with both groups (G1) and control group. But, The results showed no significant differences ($P<0.01$) in level of TSH comparison with other studies groups included in the study. Further antiTPO a significant increasing ($p<0.01$) in (G1) comparison with both groups (G2) and control group. Then this study revealed a significance increasing of ESR, hsCRP, anti dsDNA, and ANA in both patients groups rather than control group.

***Keywords:*** *SLE, ESR, hsCRP, ANA, anti dsDNA, FT3, FT4, TSH, antiTPO, VIDAS.*

## Introduction

Autoimmune disorders can be broken down into organ-specific and systemic diseases[(1)]. Autoimmune thyroid disease (AITD) is a well-known, organ-specific autoimmune disorder that is associated with many non-specific autoimmune diseases such as rheumatoid arthritis, Sjögren's syndrome, and SLE[(2)]. AITD represents a group of pathologies characterized by thyroid gland dysfunction due to a loss of immunological tolerance with the presence of cellular and humoral immune response, infiltration of auto-reactive T cells and B cells, production of autoantibodies directed against antigens from the gland and, subsequently, the development of clinical manifestations[(3,4)]. Because it is a group of autoimmune diseases (AD) clustered together,

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the clinical heterogeneity is diverse and varies among these diseases, it can be classified according to whether a state of hypothyroidism (i.e., Hashimoto's thyroiditis) or hyperthyroidism [i.e., Graves' disease (GD)][5]. These disorders derive from the diverse relationships between environmental and genetic factors[6] and are distinguished by reactivity to auto-thyroid antigens expressed as distinctive autoimmune inflammatory or antireceptor diseases[7,8].

Systemic Lupus Erythematosus (SLE) is characterized by disturbances in the immune response and autoantibody production that lead to the multi-system organ damage and dysfunction [9]. The disease is nine times more often observed in women than in men, especially in women at child-bearing years (15 – 35 years), and is also more common in those of non-European descent[10]. Candidate environmental risk factors include UV light exposure, Epstein–Barr virus (EBV) infection, endogenous retroviral sequences and multiple drugs.

The association of thyroid disorders with systemic lupus erythematosus (SLE) has been confirmed[11]. Disease activity indexes of SLE disease activity have been described by: SLEDAI. The SLEDAI is a global index that was developed in Toronto in 1986 and described in detail by Bombardier and collaborators in 1992 [12]. The SLEDAI appears sensitive to

change in disease activity over time [13]

## Subjects and Methods

The study consisted of 60 patients (30 patients of SLE without taking steroid drugs and 30 patients of SLE with taking steroid drugs) and 30 healthy controls. Their age range was (16-57)years; the sample collected from the Baghdad teaching Hospital/ Medical city Iraq. Blood samples were collected at (8:30am), by taking 5ml of venous blood from each patients and healthy human. Five ml of blood was taken by using (5ml) disposable syringe. Two ml of blood transferred to sodium citrate tubes to measured Erythrocyte Sedimentation Rate (ESR), three ml transferred into gel Tubes allowed to clot at room temperature for 30 minutes, the sample was centrifuged at 2500rpm (rotation per minute) for 5 minutes and the serum removed and deposited at (-20°C) immediately before analyzed the biochemical markers and immunological (FT3, FT4, TSH, anti TPO, and hsCRP) measured by vitek immunodiagnostic assay system (VIDAS). ANA and anti dsDNA measured by enzyme-linked immune sorbent assay (ELISA) based on biotin double antibody sandwich technology.

Exclusion criteria: The patients who are under Chemotherapy, The patients who already has thyrotoxic, and patients with vasculitis disease were excluded from the current study.

## Statistical Analysis

The program Statistical Analysis System- SAS (2012) was used to detect the effect of difference factors in the parameters of the study. The least significant difference – LSD test (Variation Analysis-ANOVA) has been used to make significant comparisons between means. The chi-square method was used to greatly equate the proportion (probability 0.05 and 0.01). Estimation of coefficient of association between parameters of variance in this analysis.

## Results

The mean age of patients in G1 was (31.06 ± 8.92) years while a slightly decrease with the G2 patients (30.23 ± 10.25) years, and the mean age of control group was (30.69 ± 9.54) years with P-Value equal to 0.944.The difference was not significant ($p>0.05$) when compared among the groups as shown in table (1). In the same table, according to the gender distribution of patients, there was a higher incidence in female (90, 93.33 %) than male (10, 6.66%) in G1 and G2 respectively.

**Table (1): The demographic data of patients with systemic lupus erythematosus SLE.**

| **Variables** | **Control N=30** | **SLE without taking steroid drugs G1 N=30** | **SLE with taking steroid drugs G2 N=30** | **P-value** |
|---|---|---|---|---|
| Age (year) (mean± SD) | 30.69 ± 9.54 | 31.06 ± 8.92 | 30.23 ± 10.25 | 0.944NS |
| Gender | | | | |
| Male | 5(16.66%) | 3(10%) | 2(6.66%) | |
| Female | 25(83.33%) | 27(90%) | 28(93.33%) | |

Table (2) shown FT3 values, Mean ± SD of patients groups, G1, G2, and control group were [(4.33 ± 1.19),( 2.90 ± 1.06 ), and (4.97 ± 0.57)] pmol/l with P-Value equal to 0.0001.The difference was high significant decrease ($p<0.01$) in level of FT3 comparison with other studies groups. FT4 [(15.33 ± 3.76),( 11.22 ± 2.55), and (15.29 ± 2.51)] pmol/l with P-Value equal to 0.0001. The results showed a high significant decrease ($p<0.01$) in level of FT4 in G2 compared with both groups G1 and control group. TSH [(3.01 ± 1.77),( 2.38 ± 1.82), and (2.11 ± 1.08)] IU/ml. The results showed no significant differences ($P<0.01$) in level of TSH comparison with other studies groups, and antiTPO [(3.97 ± 2.23),( 2.33 ± 1.96), and (1.44 ± 1.32)]IU/ml. The results showed a significant increased ($p<0.01$) in level of anti-TPO in G1comparison with both groups G2 and control group, respectively.

**Table (2): Thyroid function test values and antiTPO in patients with Systemic lupus erythematosus (SLE).**

| **Laboratory variables** | **(mean ± SD)** | | | |
|---|---|---|---|---|
| | **Control group N= 30** | **SLE without taking steroid drugs G1 (N=30)** | **SLE with taking steroid drugs G2 (N=30)** | **P-value** |
| T3 ( pmol/l ) | 4.97 ± 0.57a | 4.33 ± 1.19b | 2.90±1.06c | 0.0001** |
| T4 ( pmol/l ) | 15.29±2.51a | 15.33 ± 3.76a | 11.22±2.55b | 0.0001** |
| TSH ( IU/ml ) | 2.11 ± 1.08a | 3.01 ± 1.77a | 2.38 ± 1.82a | 0.0919NS |
| Anti-TPO ( IU/ml ) | 1.44 ± 1.32b | 3.97 ± 2.23a | 2.33 ± 1.96b | 0.0001** |
| ** (P<0.01), NS: Non-Significant. | | | | |

The results are shown in the table (3) the distribution of the patients with SLE according to results of the thyroid function test. These subgroups are; hypothyroidism group, 8(13.33%) patients. Hyperthyroidism group, 1(1.66%). Hashimoto's disease (HD) group, 3(5%). Subclinical hypothyroidism group, 2(3.33%).

**Table (3): Results Thyroid function test in subgroups of patients with SLE.**

| Thyroid function subgroups | SLE (N=60) | |
|---|---|---|
| | No. | % |
| Hypothyroidism | 8 | 13.33 |
| Hyperthyroidism | 1 | 1.66 |
| Hashimoto's disease (HD) | 3 | 5 |
| Subclinical hypothyroidism | 2 | 3.33 |

Table (4) shows the results of screening and Inflammation markers in both (G1 and G2 and control) groups. The results showed a high significant increase ($p<0.01$) in level of ESR, hsCRP, ANA, and dsDNA compared with other studies groups.

**Table (4): Comparison between difference groups in screening and Inflammation markers**

| Laboratory variables (mean ± SD) | Control group N=30 | SLE without taking steroid drugs G1 (N=30) | SLE with taking steroid drugs G2 (N=30) | P-value |
|---|---|---|---|---|
| ESR (mm/h) | 8.88 ±0.33b | 32.27±25.53a | 23.80±15.26a | 0.0001** |
| hsCRP (mg/L) | 0.564±0.25c | 3.51 ± 3.50a | 2.17 ± 1.25b | 0.0001** |
| ANA (IU/ml) | 0.629±0.26c | 2.93 ± 1.46a | 2.06 ± 1.36b | 0.0001** |
| dsDNA (IU/ml) | 8.88 ± 0.33c | 32.27±25.53a | 23.80±15.26b | 0.0001** |
| ** (P<0.01). | | | | |

## Discussion

The present work was conducted to study the thyroid dysfunction in SLE patients. sixty patients from Iraqi individuals who attended to Baghdad teaching Hospital/ Medical city Iraq known to have SLE were included in the study, their ages ranged between 16 and 57 years and the mean age were (31.06 ± 8.92, and 30.23±10.25)year in G1 and G2 respectively.

Most (91.67%) of the patients are females. As regard sex, SLE is an autoimmune disease affecting primarily women[14]. Our finding is consistent with Franco et al.[15]; they noticed that women were 91.8% and men8.2%. Also, Khanfir et al.[16] showed that women were 90.3% and men were 9.7%, with an average age at SLE onset of approximately 30.66 years. Further, Ong et al.[17] found that females were 94.2% among SLE patients' diagnosed with in age between 15to 74year.

In the current study, we illustrated that the mean values of acute phase reactants were high; ESR at 1st hour and CRP. ESR and CRP become high leveler in the autoimmune disease than malignancy or infection and rheumatoid arthritis SLE patients revealed high ESR and CRP, but ESR increase in infection and lupus, therefore it a non-specific marker for differentiating between the diseases.[18].

The results in this study show SLE patients that taking steroid drugs have more thyroid diseases when compared with the SLE patients without taking steroid drugs due to the effect taking steroid drugs, the glucocorticoid inhibits the enzyme T4 5'-deiodinas, which regulates the extra thyroidal production of T3 from T4[19].

In this study, we reported distribution of the patients with SLE according to their thyroid dysfunction and thyroid function test results, 23.33% of SLE patients had abnormal thyroid function. Our result regarding thyroid dysfunction is agree with Zakeri and Sandooghi[20]; they showed that24.1% prevalence of thyroid disorders. Our result was lower than El-Aziz1 et al[21] they showed that 33.3% prevalence of thyroid disorders.

Our patients in the thyroid dysfunction group were hypothyroidism group, 8(13.33%) patients. Hyperthyroidism group, 1(1.66%). Hashimoto's disease (HD) group, 3(5%). Subclinical hypothyroidism group, 2(3.33%). The occurrence of hypothyroidism is common in SLE, a large body of data has support this[1]. Our results were comparable to El-Aziz1 et al[21]. they observed that in their SLE group; were 10.0% subclincal hypo-thyroidisim, 6.6% biochemical hypothyroidisim, 10.0% euthyroid sick syndrome, 3.3% subclincal hyperthyroidisim, and 3.3% biochemical hyperthyroidisim. Also, Chan et al.[22] noticed that 4.3% of their SLE patients had clinical hypothyroidism. Mader et al.[23] as well, cleared that 11.6% of their SLE patients had clinical hypothyroid compared to 1.9% in the control group. Variable results were reported in many studies; Hypothyroidism and hyperthyroidism prevalence ranged from 3.9% to 39% and 0.0% to 10.9%, respectively. [24,25,26,27].

## Conclusion and Recommendation

Thyroid disorders are common in patients suffering from SLE. The most common form is hypothyrodism. Patients with SLE should be assessed for thyroid disorder by testing for early detection of thyroid abnormalities FT3, FT4, TSH and anti TPO Ab. For supporting and clarifying the association between SLE and thyroid disorders in Iraqi, further studies on a large number of patients are required.

**Acknowledgment** I would like to express my special thanks and also the authors are grateful to to the staff of Baghdad teaching Hospital/ Medical city Iraq especially Dr. Ali Hussein Al-Hafidh for their kindness, generosity help in providing samples.

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest**: Non

**Funding**: Self-funding

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# Impact of Food Simulants Material on Orthodontic Bond Strength after Application of Caries Infiltrant Resin (In Vitro Study)

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## Abstract

**Objective:** To investigate the effect of using different food simulant materials on the shear bond strength (SBS) of orthodontic bracket after Icon application. **DESIGHN:** Laboratory study. **SETTING:** Pediatric dentistry, Orthodontics & Prevention dentistry department, Dentistry College, Kufa University & department of materials, Technology university.

**Methods:** Metal brackets were bonded to 48 extracted premolars and were randomly arrange for three categories with 16 teeth for each, revealing the storage solutions, which were distilled water, 50% aqueous ethanol (alcoholic food), and corn oil (fatty food). Then each category was split for two subgroups, with 8 teeth describing Icon application, all specimens are immersed in their corresponding food simulants for 30 days. After the completed proposed time, the specimens were debonded by using an Instron apparatus to test the SBS**. Results:** Results showed significantly diminished the bond strength of orthodontic adhesive after holding the specimens for 30 days in the food simulants specially ethanol (highest for 50% ethanol, less for corn oil & least for D.W). Icon categories showed higher SBS rather than non-Icon categories. **Conclusion:** Application of Icon on enamel will increase the bond strength & the food simulating agents especially food and rinses containing ethanol could influence the orthodontic bond strength which causes bond failure so that the clinicians should inform their patients concerning their possible adverse effects and complications.

***Key Words:*** *Orthodontics, Food simulants, bonding strength, Resin Infiltration; Icon, caries infiltrant resin, White spot lesion.*

## Introduction

Orthodontic treatment is mostly accomplishing with fixed orthodontic appliances & establish significantly higher WSL than normal persons, because oral hygiene is more ambitious in patients with numerous-bracket orthodontics than in patient without fixed appliance [(1)]. Pervasiveness of WSLs is relatively huge, affecting more than 25 % of the patients earning orthodontic treatment, capturing at least one new lesion over the treatment [(2)]. Demineralization may occur rapidly, as fast as in period 4 weeks after the placement of brackets [(3)].

More recently, a minimum invasive treatment pathway was introduced, in which the WSL is infiltrated adopting a low-viscosity resin. When tooth surface been carried out by the infiltration resin with demand for an adhesive method like: using orthodontic brackets & when the used infiltration material that not be detached, the question: Is there bonding force between the treated exterior of the tooth and the unity of this material to the used bonding scheme? [(4)]. The aim of this study was to study the effect of using different food simulant materials

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on the SBS of orthodontic bracket after utilization of Icon.

## Marerial & Methods

In this our study, we used seventy extracted intact upper first premolars [5]. Forty-eight teeth were elected after being inspected by magnifying lens [6]. The elected teeth must be:

1-Caries free.

2-Free of enamel cracks or restorations.

3-Without developmental anomalies.

Standard edgewise S.S. orthodontic bracket (Ortho Technology, USA) and a light cure composite adhesive (3M, USA) were used in this study.

The food simulants were those approved by the Food and Drug Administration in U.S.A. [7]:

1. Beverages including alcoholic drinks simulated by 50% aqueous ethanol solutions.

2. Fatty food including butter, fatty meats and vegetable oils simulated by corn oil.

3. Water established using distilled water.

The possessed teeth were split into three categories, containing sixteen teeth each, according to the type of storage solution, which are distilled water, 50% aqueous ethanol (alcoholic food), and corn oil (fatty food). Then each category was split for two subgroups with eight teeth for each, according to Icon application.

A two metal plates with L-shape specially made for this purpose, were painted with a thin layer of separating medium (Vaseline) and placed opposite to each other forming a box around the vertically positioned teeth. Then the acrylic (Vertex, Netherlands) was poured till reach the cemento-enamel junction of the teeth [8]. After mounting, the buccal exterior was scrub by a rubber cup & pumice which is free from fluoride for 10 s [9]. The teeth were flush by water for 10 s. and then dry with air. This strategy was set to mimic the 'real life' of clinical condition [10]. Etching by using Phosphoric acid (37%) on the exterior of the crown as long as 30 s. after that rinsed with water, then dried with air till the exterior crown marked as chalky [11].

**BONDING PRECEDURE WITHOUT ICON APPLICATION:**

The 7th generation bond (3M company, USA) was used then orthodontic adhesive was administered to the S.S. brackets [12]. Which was then fixed in the midst third of the buccal exterior, the extra composite was removed by using dental probe [13]. The adhesive composite was curing up to 40 s [14] utilizing LED curing device with a range 450-550 nm.

**BONDING PRECEDURE WITH ICON APPLICATION:**

This done by using (Icon-Dry, DMG, Hamburg, Germany). Apply Etch for 2 min. next washed by water, after that dry with air, Handle Icon-dry 30 sec. and check it by visual inspection, then dry air. Handle Icon-Infiltrant, to 3 min. give away by air then curing for 40 sec. Infiltrant was applied for 1 min. clear away extra infiltrant then curing for 40 sec. The 7th generation bond (3M, USA) was used then orthodontic adhesive (3M, USA) was applied.

Then, all tested categories were sinking in distilled water or to the food simulant according to their category, and preserve it in the incubator at 37ºC for 30 days [15].

After 30 days, they ready for the SBS that was done by an Instron universal machine (Laryee, 50 KN, China), a defined speed was 0.5 mm/min. [16]. The loading fail (Newton) / paltry of bracket (10.90 $mm^2$) to obtain the SBS in MPa. Statistical analysis was implement with applying SPSS software Version 21.

## Results

The SBS (MPa) descriptive statistics and the effectiveness of food simulants material & Icon usage on the SBS were calculated (Table 1).

Anova test was performed to examine the difference between each three types of storage medium; SBS reduction was high (highly significant) for corn oil group & highest (highly significant) for 50% ethanol alcohol group and was the least reduction for D.W. group (Table 2).

Comparison of SBS of adhesive & Descriptive statistics according to the Icon application was calculated. Mean rate of SBS were highest (highly significant) in

Icon category in comparison with the other category without Icon application as displayed in (Table 3).

## Discussion

This study was performed to investigate the response to aqueous foods, alcoholic foods, and fatty foods as represented by dietary simulating liquids (D.W, corn oil & 50% aqueous ethanol) and their effect upon the SBS of orthodontic adhesive bonding material with the presence of caries infiltrant resin (Icon).

The treatment of WSL by using infiltrating instead of or postponing conventional restorative treatment may have a positive impact on good oral health as it helps to increase in life cycle of a tooth [17].

Orthodontic treatment based on a sufficient bond strength of brackets to enamel. To withstand normal orthodontic force, the minimal bonding strength should be between 6 and 8 MPa [18].

This is in vitro methods that simulating oral condition have been designed to mimic the clinical performance. Because the difficulty in vivo of oral environments can be partially be simulated in vitro, so there is no in vitro test can be to mimic the complex processes found in vivo [19]. in vivo evaluation, it is very complicated, time consuming, expensive & the most important issue is the ethical reasons. Thus, Continuous exposure of solution was preferred to hasten the resistant effect of the evaluated material [20]. This may prompt solution to be invasive more into the specimens. Intermittent exposure to a resistant agent will causes low invasion rate because simulant desorption while disclosure. The material may not fully desorb due to the force established by the invasion gradient to continue invasion into the specimens [21]. in clinical conditions the agent may either be absorbed by the adherent detritus at the interfacial margins or generated by decomposition [22]. The distilled water group show the high SBS because it is not very susceptible by chemical breakdown. Lee et al show that when exposure to artificial saliva (90-95% water) for 30 days of engagement will not effect on bond strength [23].

A high significant result in SBS of the specimens immersed in food simulants with 50% aqueous ethanol showed the less in bond strength. This is in agreement with several previous studies [15].

The ethanol has solvent properties as cross linked dimethacrylate resins are virtually insoluble, in spite of that its capable of swelling in good solvents [24]. The ethanol which dispersed into the composite may result in micro-crack in architecture that causes bonding weakness. Ethanol has dissolving feature similar to Bis-GMA and this may farther improve its seepage into the composite leading to farther destruction [25]. The diffusion properties of the ethanol solution in dental composite specimens is much more than that of water [26].

Clinically, intra-oral exposure to ethanol either from alcoholic mouth washes or from drink. Usually, orthodontists prescribe mouth washes for their patients for the whole treatment time to keep high oral hygiene [27].

Apply of peppermint oil to assist in orthodontic bond and resin elimination [28]. The significant maceration of resin can occur after continuous exposure to the oil [29]. The time duration being clinically offensive. The 1-hour liability to the oil may cause decrease in bond strength, However, the oil remarkably loud up of ARI scores, display fewer resin on the enamel exterior, which could helpful in 'clean up' next to bond elimination [15].

According to our result the Icon group show high SBS (high significant). By using infiltration to help for protection against demineralization, the using of resin infiltration with multi adhesive systems used in bonding seems to be feasible, this let us go ahead with fixed orthodontic treatment after using infiltration. moreover, there were seems to be strengthen performance of adhesives bond [30,31].

The Icon is a useful to enhance the SBS of brackets to the enamel exterior [27]. The effect of Icon on the SBS of resin cements that used on sound and demineralized enamel. The Icon elevated the SBS of most resin cements types while decline the possibility of enamel fracture during debonding [32]. The pair of above studies are compatible with our SBS integrity of Icon.

The Icon have a hydrophilic trait that empower their seepage into the tooth exterior which results in a direct connection to this tooth exterior. This will diminish the

effectiveness of O2 and enhance the polymerization, in turn empower the SBS [33]. Even on intact enamel, the using of Icon had supplementary action on SBS, possibly as an action of the excessive moisten properties of the TEGDMA resin [34]. It's clear that the Icon may be used on the tooth exterior which not skeptically hamper the bond betwixt resin composite and enamel exterior. It displayed to be statistically preferable rather than other categories .

| Bonding Types | Food Simulants | No. | Shear Bond | | Statistical Differences | | |
|---|---|---|---|---|---|---|---|
| | | | Mean | SD | F- value | df | p-value |
| ICON | Alcohol | 8 | 9.14 | 0.971 | 19.118 | 2 | > 0.001** |
| | Corn Oil | 8 | 11.23 | 0.835 | | | |
| | D.W | 8 | 13.66 | 2.191 | | | |
| Without ICON | Alcohol | 8 | 6.70 | 1.133 | 21.267 | 2 | > 0.001** |
| | Corn Oil | 8 | 8.43 | 0.915 | | | |
| | D.W | 8 | 10.06 | 1.035 | | | |

**Table 1. Mean and S.D values of SBS among food stimulants in relation to bonding type with statistical differences.**

**Table 2. Statistical differences of shear bond strength among food stimulants in relation to bonding types.**

| **Food Simulants** | **Bonding Types** | **No.** | **Shear Bond Strength** | | |
|---|---|---|---|---|---|
| | | | **t-value** | **df** | **p-value** |
| Alcohol | ICON | 8 | 4.621 | 14 | > 0.001** |
| | Without ICON | 8 | | | |
| Corn Oil | ICON | 8 | 6.397 | 14 | > 0.001** |
| | Without ICON | 8 | | | |
| D.W | ICON | 8 | 4.202 | 14 | 0.001** |
| | Without ICON | 8 | | | |

**Table 3. Mean and standard deviation values of bonding types with statistical difference.**

| Bonding Types | No. | Shear Bond Strength | | Shear Bond Strength | | |
|---|---|---|---|---|---|---|
| | | Mean | SD | t-value | df | p-value |
| ICON | 24 | 11.34 | 2.351 | 4.960 | 46 | 0.001** > |
| Without ICON | 24 | 8.40 | 1.714 | | | |

## Conclusion

1-According to our result, the storage in food simulants for 30 days (50% aqueous ethanol &corn oil) produced a significant reduction in SBS.

1-The Icon application can be used on enamel exteriors even before bonding orthodontic brackets as improve bonding & used to inhibit demineralization.

3-The use of alcohol containing mouth washes may cause premature debonding of brackets especially at the beginning of treatment. So it can be rational to instruct the patients to fend off alcoholic mouth rinses.

4- The use of alcohol containing mouth washes had advantage by making the debonding easier at the end of orthodontic treatment.

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest**: Non

**Funding**: Self-funding

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# Antibacterial Activity of Selected Fractions Extract of *Coptis chinensis* Franch Rhizomes

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## Abstract

The antibacterial activity of different fractions of selected extract of *Coptis chinensis* Franch rhizome was evaluated on gram positive bacteria. Three extracts were tested at concentrations ranging from 1 mg/ml, 10 mg/ml, and 100 mg/ml *in vitro* on three bacterial strains, *Staphylococcus aureus*, *Streptococcus pneumoniae*, and *Bacillus anthracis,* which was done by performing disc diffusion for growth inhibition. The methanol extract at concentrations of 100 mg/ml displayed the most significant zone of inhibition of (22.67 ± 3.055mm), (21.67 ± 3.512 mm), (16.67 ± 1.528 mm) against *Streptococcus pneumoniae*, *Staphylococcus aureus*, and *Bacillus anthracis,* respectively. The TLC separation of the extracts showed that each of them may contains constituents that are phenolic in nature. From the $R_f$ values of the spots found in the various extracts is that the *Coptis chinensis* Franch rhizome contains some other non-phenolic compounds responsible for its effect. The selected methanol extract is then subjected to column chromatography and collected 4 fractions. Out of the four fractions, F2 fraction demonstrates the most significant zone of inhibition of 15.00 ± 1.000 mm, 12.33 ± 1.528 mm and 10.00 ± 2.000 mm against *Streptococcus pneumoniae*, *Staphylococcus aureus*, and *Bacillus anthracis,* respectively.

***Keywords:*** *Coptis chinensis, Fractions, Antibacterial activity, Zone of inhibition*

## Introduction

Infectious diseases have persisted as a major health problem for almost half a century now, and there has been increasing incidence of resistance to currently available antibacterial [1]. There is the need for intensive studies for the possible discovery of new agents with antibacterial potentials [1]. Plants have provided a good source of antimicrobial activity. The primary benefits of using plant-derived medicines are that they are relatively safer than synthetic alternatives, offering profound therapeutic benefits, absence or very few side effects and more affordable treatment [2].

Wide range of medicinal plant parts is used for extract as raw drugs and they possess various medicinal properties. Usually, these plants are rich in a wide variety of secondary metabolites, such as tannins, terpenoids, alkaloids, and flavonoids, which have been found to have antimicrobial properties *in vitro* [3]. An example of traditional Chinese plant that possesses various medicinal properties is *Coptis chinensis* a member of Ranunculaceae family, is widely cultivated and produced in Sichuan, Yunnan, and Hubei. This herb is particularly endemic to the middle and southern regions of China. It comprises three main species, among these species, *Coptis chinensis* Franch is regarded as most widely used with a slight odor, very bitter taste, and contains the highest bioactive alkaloids content [4]. Extract of *Coptis chinensis* Franch has a strong antibacterial activity and is used for

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treating dysentery, diabetes, cholera, leukemia, and lung cancer. They are usually characterized by the presence of the major alkaloids: berberine, palmatine, coptisine, berberastine, and jatrorrhizine [5]. Additionally, aqueous extract of *Coptis chinensis* Franch containing bioactive alkaloids that have been applied widely in clinics, and recent studies discovered that aqueous *Coptis chinensis* Franch extracts expressed a hepatoprotective effect on carbon tetrachloride-induced acute liver hepatotoxicity in rats [6], and also possessed analgesic effects in a rat model of irritable bowel syndrome [7].

The purpose of this study was to evaluate the antibacterial activity of selected fractions extract prepared from the dried rhizomes of *Coptis chinensis* Franch on gram-positive bacteria, *Staphylococcus aureus, Streptococcus pneumoniae, and Bacillus anthracis*.

## Materials and Methods

### Microbial strains

Three strains of standard bacteria, *Staphylococcus aureus, Streptococcus pneumonia,* and *Bacillus anthracis,* were collected from the Microbiology Laboratory at Management and Science University in Selangor, Malaysia. All the three bacteria were supplied as cultures on Mueller-Hinton Agar (Mast Group Ltd.) plates. Plates were stored in the cold room (2 - 4°C) until the study was started [8].

### Plant material

The rhizome of *Coptis chinensis* Franch has been collected locally from Chinese medicinal botany shop within the area of Klang, Selangor, Malaysia.

A total of 100 grams of *Coptis chinensis* Franch rhizomes were thoroughly cleaned and washed 2–3 times with running tap water and once with sterile distilled water in the lab to avoid dusts and other unwanted materials. These samples were then allowed to dry in the oven for 2 days at 45°C. After drying, the rhizome part of the plant was grounded into fine powders using electrical blender. The grounded powders were then transferred into an airtight container and was utilized for extraction. This is to ensure the extraction to be more effective as smaller particles tend to have large surface area which help them to get in contact with the solvent, thus, ease the extraction of active compound [8].

### Extraction of plant material

The dried *Coptis chinensis* Franch rhizomes are then extracted using Soxhlet extractor. This extraction is performed at room temperature (20°C–25ºC) by using 80% methanol, 70% ethanol and chloroform as solvent in the ratio of solvent:sample =10:1 v/w. 20 grams of dried, grounded powder was extracted in 200 ml of the above mentioned solvent via soxhlet extraction method. The solvents were obtained from the Research Laboratory of Management and Science University in Selangor, Malaysia. The whole extraction process took place for nearly 8 hours. Once the extraction was completed, the obtained extract was first filtered using Whatsman filter papers and the solvent was removed by rotary evaporator under reduced pressure at temperatures below 45ºC in order to obtain a concentrated extract. The remaining thick semisolid extract was scrapped out from the evaporator flask using a spatula. Each different concentrated extract was then transferred into a container and kept in cold room until further use [8].

### Preliminary antibacterial test

Before testing with bacteria, medium for bacterial growth were prepared. The medium was prepared by dissolving 15.2 g of Mueller Hinton Agar in 400 ml of distilled water in a schott bottle. These dissolved medium were autoclaved at 15 lbs. pressure (121°C) for 15 minutes. The sterilized media was mixed well and poured into sterile dish plates, with 15ml per plate while still molten. The plates were set aside for storage or further use.

Pattern of inoculation lines for each bacterium, *Staphylococcus aureus, Streptococcus pneumoniae* and *Bacillus anthracis* were made on the agar. .Then, the impregnated discs containing anti-microbial agent, vancomycin (positive control), the resulting crude extract of different concentration (i.e. 1 mg/ml, 10 mg/ml, 100 mg/ml), and solvent (80% methanol, 70% ethanol and chloroform) as negative control were arranged on the surface of the inoculated plates and incubated at 37°C ± 0.05 for 24 hours. This method is known as preliminary antibacterial evaluation. Extract yielding greater zone of inhibition was used further for fractionation [9].

**Thin layer chromatography**

Thin layer chromatography (TLC) is carried out to isolate the principle components that were present in most effective extracts of plant. In this experiment, ratios of different solvent systems of different polarities are prepared. Selection of solvent is normally done on the basis of increasing polarity [10].

Nine different solvent systems were prepared by adding ethyl acetate and hexane in different ratios. Each of these solvent was prepared for 10 ml and poured into different beakers for 9 beakers. Each beaker was placed with a TLC plate in it, which has been spotted with the selected extract concentration (methanolic crude extract – 100 mg/ml) from preliminary antibacterial test on it via capillary tube. The beakers were then covered with aluminum foil and left for few minutes for the solvent to rise up to the top of the TLC plate. Detection of spots was by spraying plates with ferric chloride, iodine and DPPH, and viewing under UV lamp [11]. The $R_f$ value of spot formed on each TLC plate was then recorded. The solvent with the best $R_f$ value was then selected to be used for column chromatography

**Fractionation of crude extract**

The selected extract, methanol crude extract, 100 mg/ml, was fractioned by filter column chromatography over 300 g of silica gel 60 (S). The column chromatography was eluted with approximately 3.0 L of the solvent hexane, in order of increasing polarity, until a clear extract was obtained at the end of the elution [9]. As soon as the colored compound begins to elute, 4 different fractions of 20 mL were collected at different times. Fractions were stored at 4°C.

Antibacterial test using the agar diffusion method (disc) and diameter of the inhibition zone

The *in vitro* antibacterial activity of the methanol crude extract fractions from *Coptis chinensis* Franch rhizomes are determined by the disc diffusion method. The complete diffusion of samples into the Mueller–Hinton Agar was visually confirmed. Mueller-Hinton Agar medium is sterilized and poured into the plate; the medium is allowed to settle and stored at 4°C. The three bacterial strains, *Staphylococcus aureus, Streptococcus pneumonia,* and *Bacillus anthracis* were cultured overnight at 37°C in Mueller-Hinton Agar. The bacterial colonies were transferred into a sterile loop or cotton swab and mixed well from the fresh agar plate. The suspension was adjusted to achieve a turbidity equivalent to a 0.5 McFarland turbidity standard. This suspension resulted in a suspension containing approximately $1\times10^9$ CFU/mL [7]. 1 mL of inoculum of the bacterial strains ($10^6$ CFU/mL) was poured into petri dishes (90 mm) already filled with Mueller-Hinton Agar. Then, 3 mm wells were used and filled with 20 µL of samples. First one was placed with a positive reference Vancomycin (30 µg/disc) (Oxoid), the second was with a negative control, 80% methanol disc, and the third was with one fraction of methanol crude extract. Three hrs. were required for pre-incubated the Petri dishes at room temperature, allowing the complete diffusion of the samples; then, they were incubated at 37°C for 24 hrs [3]. Three replicates of plates were then examined for the presence of inhibitory zone and the diameter of the zone (mm) formed around the disc was measured.

## Statistical Analysis

Experiments were conducted in triplicates, and the values presented as their mean ± standard deviation. Analysis was done with ANOVA with the significance level at $p<0.05$.

## Results and Discussion

The rhizomes of *Coptis chinensis* Franch were extracted with three different solvent systems, 80% methanol, 70% ethanol and chloroform as a preliminary antibacterial evaluation. Extracts were evaluated at concentrations ranging from 1 mg/ml, 10 mg/ml, and 100 mg/ml *in vitro* against three bacterial strains, *Staphylococcus aureus*, *Streptococcus pneumoniae*, and *Bacillus anthracis*. Zone of inhibition of these different extracts were compared with that of standards antibiotic, Vancomycin, for antibacterial activity. The majority of these different extracts had inhibitory effect at different concentrations (Table 1). Results indicated that methanol extract at concentrations of 100 mg/ml displayed the most significant zone of inhibition of 22.67 ± 3.055 mm, 21.67 ± 3.512 mm and 16.67 ± 1.528 mm against *Streptococcus pneumoniae*, *Staphylococc*

**Table 1. Zone of Inhibition of Different Extracts Concentration on *Staphylococcus aureus, Streptococcus pneumonia* and *Bacillus anthracis.*[a]**

| Bacterial strains | Extract conc. (mg/ml) | Diameter of inhibition zone (mm)b | | |
|---|---|---|---|---|
| | | 80% methanol | 70% Ethanol | Chloroform |
| Staphylococcus aureus | 1<br>10<br>100 | 0.00 ± 0.000<br>13.0 ± 0 3.606<br>21.67 ± 3.512 | 0.00 ± 0.000<br>0.00 ± 0.000<br>11.33 ± 9.815 | 0.00 ± 0.000<br>3.67 ± 4.933<br>16.33 ± 2.517 |
| Streptococcus pneumonia | 1<br>10<br>100 | 0.00 ± 0.000<br>6.67 ± 5.774<br>22.67 ± 3.055 | 2.00 ±3.646<br>10.00 ± 1.000<br>17.33 ± 2.517 | 0.00 ± 0.000<br>8.33 ± 1.155<br>17.33 ± 2.517 |
| Bacillus anthracis | 1<br>10<br>100 | 2.00 ± 3.404<br>12.00 ± 2.646<br>16.76 ± 1.528 | 0.00 ± 0.000<br>6.33 ± 0.577<br>16.00 ± 1.000 | 5.67 ± 0.577<br>6.67 ± 0.577<br>17.33 ± 2.887 |

[a]Values are mean ± SD of three replicates, [b]diameter of inhibition zone (mm) include the disc diameter.

*us aureus*, and *Bacillus anthracis*, respectively. In comparison with standard antibiotic, Vancomycin (30 µg/disc), results showed that there was no significant differences ($p > 0.05$) in the diameter of zone of inhibition. This results indicated that the *Coptis chinensis* Franch rhizome of methanol extract inherits a potential antibacterial property compared to ethanol and chloroform extract.

The thin layer chromatography (TLC) separation of the extracts show that each of them may contains constituents that are phenolic in nature (Tables 2). From the $R_f$ values of the spots found in the various extracts is that the plant contains some other non-phenolic compounds responsible for its effect [11]. Phenolic compounds are also reported to have antioxidant effect [12]. Some non-phenolic compounds have been reported to show antioxidant activity and antimicrobial effect. Therefore it can be inferred that it is the presence of these types of constituents that are responsible for the observed antibacterial activity of this plant. Based on $R_f$ values and number of spots formed, the solvent ratio of 9:1 shows a better result and was used for fractionation via column chromatography.

**Table 2. Retention Factor ($R_f$ ) Values Formed by Different Solvents Ratios**

| Solvent Ratios | Rf Value | | | Color Formed |
|---|---|---|---|---|
| Hexane: Ethyl acetate | 1stSpot | 2ndSpot | 3edSpot | |
| 1:9 | - | - | - | - |
| 2:8 | - | - | - | - |
| 3:7 | - | - | - | - |
| 4:6 | 0.88 | - | - | Yellow |
| 5:5 | 0.30 | - | - | Yellow |
| 6:4 | 0.20 | 0.98 | - | Brown |
| 7:3 | 0.33 | 0.64 | - | Brown |
| 8:2 | 0.50 | 0.68 | - | Brown |
| 9:1 | 0.38 | 0.58 | 0.84 | Brown |

Four fractions, 20 ml each, of *Coptis chinensis* Franch methanol extract were collected. Fractions obtained were in different colors (Table 3), this indicates the existence of various components in the extract. The antibacterial activity of each fractions was determined. To perform a rapid screening study of potential antibacterial activity, a disc diffusion assay was used to evaluate the inhibitory effect. The majority of these different fractions had inhibitory effect against *Staphylococcus aureus, Streptococcus pneumoniae* and *Bacillus anthracis* after incubated for 24 hours. Among all of these fractions, second fraction (F2) demonstrates the greatest inhibition zones as compared to other fractions. Based on the comparison table, F2 displayed inhibition zones of 15.00 ± 1.000mm against *Streptococcus pneumoniae*, followed by 12.33 ± 1.528 mm against *Staphylococcus aureus*, and 10.00 ± 2.000 mm against *Bacillus anthracis.*

**Table 3. Fractions of Methanol Extract of Coptic chinensis Franch Rhizome Formed by Column Chromatography.**

| Methanol Fractions | Volume Collected (ml) | Color Formed | Retention Time (RT) of collection (min.) |
|---|---|---|---|
| F1 | 20 | Yellow | 30 |
| F2 | 20 | Yellow - Orange | 40 |
| F3 | 20 | Orange | 55 |
| F4 | 20 | Dark Orange | 75 |

Based on one-way ANOVA analysis, F2 and F3 are having significantly higher ($p$ <0.001) antibacterial activity than F1 and F4. Within both of these fractions, F2 & F3 are not statistically different ($p$> 0.05), which means that both have almost similar inhibition effect.

Standard antibiotics, Vancomycin (30µg/disc) showed much higher significant difference ($p$ < 0.001) than other fractions on *Staphylococcus aureus, Streptococcus pneumoniae* and *Bacillus anthracis.* This explains that treatment with glycopeptide antibiotics, Vancomycin is more effective and possesses more antibacterial activity compared to these four fractions of *Coptis chinensis* Franch of methanol extracts on gram positive bacteria. Therefore, this clearly proves that the fractions of *Coptis chinensis* Franch rhizome of methanolic extract, particularly F2, inherits a potential antibacterial property against *Staphylococcus aureus, Streptococcus pneumoniae* and *Bacillus anthracis.*

## Conclusion

The finding of the study revealed that all the fractions obtained from *Coptis chinensis* Franch rhizomes of methanol extract did possess antibacterial activity against *Staphylococcus aureus, Streptococcus pneumoniae* and *Bacillus anthracis.* Among these fractions, F2 fraction showed more inhibition against those bacterial strains. Future studies are suggested for identification of the minimum inhibitory concentration (MIC) and phytochemical testing of *Coptis chinensis* Franch rhizome of methanol extract fractions.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest**: Non

**Funding**: Self-funding

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# Therapeutic Effect of Chemically Synthesized Silver Nanoparticles on Aphthous Stomatitis in Some Iraqi Patients

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## Abstract

Silver nanoparticles (AgNPs) were synthesized by a chemical reduction method. The particles were synthesized using silver nitrate solution with sodium borohydride as the reducer. The resulting colloidal AgNPs were characterized by UV-Visible spectroscopy, and FTIR. Aphthous stomatitis is a common and recurrent painful disease of the oral mucous membrane, classified in to three different aphthous types: minor, major and herpetiform. It may appear due to a variety of causes including: stress, food, hypersensitivities, infection, trauma, drug allergy, nutrition deficiencies (Iron, zinc & vitamin B12) or it could be a symptom of serious disease such as carcinoma. In this study, (75) young Iraqi patients aged (18-24) years divided in to two groups according to their gender (25 male and 50 female) all of them are suffering from major Aphthous ulcers in the mouth. The solution of (10 µg/ml) concentration of silver nanoparticles showed a uniform cycle inhibition around the ulcer growth zone while, increasing of (AgNPs) solution to (20 µg/ml) showed a highly and significant inhibitory effect against isolates from Aphthous stomatitis during the first 24 hours only in both male and female groups. Further studies is needed to investigate the inhibitory mechanism of (AgNPs) against Aphthous stomatitis.

***Keywords:*** *patients; health; therapy; toxicity; Silver NPs; Aphthous*

## Introduction

A great attention has been directed toward the use of new medicinal preparations at nanoscale levels. A huge number of physical, chemical, biological and hybrid methods are available to synthesis different types of nanoparticles (NPs) [(1)]. Silver nanoparticles (AgNPs) of 100 nm dimension or less have unique physical, chemical and biological properties [(2)]. AgNPs are considered one of the most promising anticancer agents, protects against bacterial [(2)], fungal [(3)], and viral infections [(4)].

Aphthous stomatitis is a common and recurrent painful disease of the oral mucous membrane. It is start as small red and simple or grouped papules, classified in to three different aphthous types: minor, major and herpetiform. It may appear due to a variety of causes including: stress, food, hypersensitivities, infection, trauma, drug allergy, nutrition deficiencies (Iron, zinc & vitamin B12) or it could be a symptom of serious disease such as carcinoma [(1)].

Minor aphthus stomatitis usually occurs in crops of 1-5. They are small; usually less than 1cm (5mm) in diameter appears as a white or yellowish center with an inflamed red out edge, roundest, painful & shallow. Common sites are tongue margin &inside the lips &cheeks normally take 7-14 days to heal. While major aphthous stomatitis characterized by large (greater than 1cm in diameter), numerous in crops of 10 or more. It heals slowly & may persist for many weeks. Herpetiform (uncommon) are pinpoint & occur in large crops of up to 100 at a time, usually, heal within a month, often occur in posterior part of mouth (an unusual location for MAU) [(5)].

However, many cases may associate with severe pain and difficulty in eating thus a topical corticosteroid and anesthetic can provide a short-term relief and facilities

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eating [5]. Silver nitrate is often used as a chemical cautery, while carbon dioxide laser can provide pain relief almost instantaneously [1].

Actually, there is no effective medication or treatment for the prevention or even future recurrence. The aim of our study is to synthesize colloidal silver nanoparticles and exert their effects on the recurrent aphthous stomatitis.

## Material and Method

### A) Material

Silver Nitrate ($AgNO_3$), sodium borohydride ($NaBH_4$) merck (Germany), Mueller Hinton Agar was procured from Himedia (India). Sterile distilled water was used throughout the experiments.

B) Chemical synthesis of silver nanoparticles

Oxidation reduction method was used for the synthesis of silver nanoparticles, 0.01 M of sodium borohydride was added drop by drop to 0.001 M of silver nitrate solution under stirring. Color changing is appearing from pale yellow, red and finally to almost black color as shown in figure 1. Centrifuged the resulted aqueous solution at 1500 rpm for 30 minutes and dried at 100 °C [6].

**Figure (1): Synthesized colloidal silver nanoparticle solution**

C) Sample collection

Seventy-five young patients (25 male and 50 female) aged 18-24 years suffering from Aphthous ulcers in the mouth arrived to biology lab, department of Medical Analysis College of Health and Medical Technologies, Middle Technical University, Iraq. Clinical samples were collected by sterile swops for major and severe aphthous stomatitis only, minor aphthous stomatitis and simple cases were excluded.

D) Silver nanoparticles test

A solution of two different concentrations of Silver nanoparticles were tested for their activity against identified aphthous ulcer by the modified Kirby Bauer agar well diffusion method according to the CLSI guidelines (2011) [7]. The preferred concentration 10, 20, µg/ml were prepared and twenty milliliter of nutrient agar medium was poured into sterilized Petri plates. With the help of a sterilized borer, agar wells of 6 mm diameter were prepared. The wells were injected with 10, 20µl of the synthesized silver nanoparticle solution, 20 µl of 1 mM $AgNO_3$ as a negative control. The plates were further incubated at 37 °C for 24 h and were then examined for the presence of zones of inhibition. The inhibition zone was measured and expressed in centimeter scale [6].

## Results and Discussion

A) Fourier transform infrared spectroscopy FTIR

FTIR analyses were carried out using ALPHA FTIR spectrophotometer figure (2). The samples were prepared by using the KBr pellets technique and were analyzed to check the presence of functional groups of the surface chemistry of the reduced (AgNPs). The FTIR spectrums were collected at a spatial resolution of 4 $cm^{-1}$ in the transmission mode, between 4000 and 400 $cm^{-1}$, respectively [8].

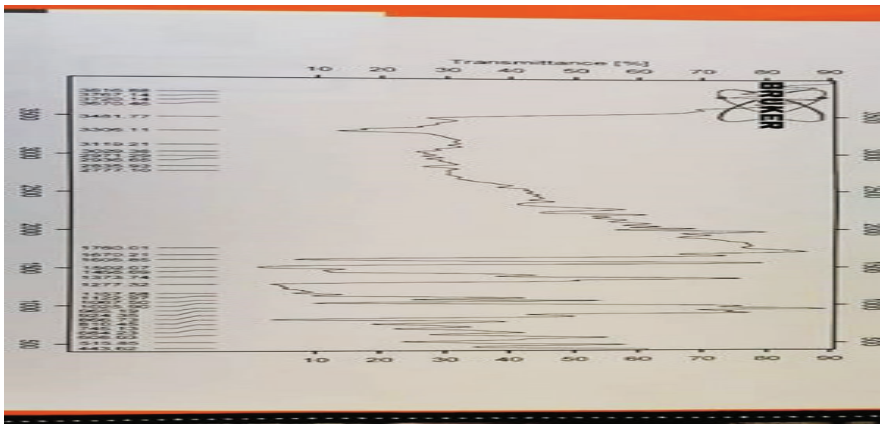


**Figure (2): FTIR spectrum of chemically synthesized silver nanoparticles**

**B) Silver nanoparticles activity**

Recurrent aphthous stomatitis (RAS) commonly known as aphthae or canker sores, have uncertain etiology with causes not fully elucidated [9]. Minor (RAS) are mostly small and below 5 mm in diameter that heal between 4-7 days and usually no treatment is needed, whereas, the severe painful ulcers may be debilitating causing weight loss due to malnutrition.

To our knowledge, there is no published study on the effect of silver nanoparticles in aphthous ulceration. The current study included (75) young Iraqi patients aged 18-24 years divided in to two groups according to their gender (25 male and 50 female) all of them are suffering from major and severe Aphthous ulcers in the mouth. The results showed a decrease in the size of ulcer when the concentration of (AgNPs) solution was (10 µg/ml) figure (3). While, It was found that the increasing concentration of (AgNPs) to (20 µg/ml) resulted in a highly significant decrease in aphthous ulcer size with a measurable zone of inhibition in both groups female and male patients during the first 24 hours figure (4) and table 1.

**Figure (3): Inhibitory effect of silver nanoparticle solution at concentration of (10 µg/ml).**

**Figure (4): Inhibitory effect of silver nanoparticle solution at concentration of (20 µg/ml).**

**Table (1): Average Inhibitory zone level of different concentration of silver nanoparticles against aphthous stomatitis.**

| Gender | (10 µg/ml) AgNPs | (20 µg/ml) AgNPs |
|---|---|---|
| Female | 0.35 ± 0.10 cm | 1.1 ± 0.20 cm |
| Male | 0.45 ± 0.13 cm | 1.4 ± 0.16 cm |

Silver nanoparticles have proven in many recent studies to exert a biological activity at non-cytotoxic concentrations, but the mechanism underlying their inhibitory activity has not been not fully elucidated [(10)]. Nano sized silver particles is unlike other silver precursors like silver oxide and silver nitrate because of their enhanced surface area provides the more toxic effect to the microbes [(6)].

A recent study by (Reidy et al.) [(11)], suggested that the Reactive Oxygen Species (ROS) released by the silver nanoparticles has been preventing the DNA replication, uncontrolled oxidation of proteins, breakdown of membrane function.

The U.S. Environmental Protection Agency has published a reference dose (Rfd), which is for oral silver exposure is 5 µg/ kg daily, with a critical dose estimated at 14 µg/ kg daily for the average person [(1)]. It has been reported that silver nanoparticles (SNPs) are nontoxic to humans and most effective against bacteria, viruses and other eukaryotic microorganisms at low concentrations and without any side effects [(10)].

The limitation faced in our study was the inability to measure the size and shape of silver nanoparticles due to lack of measurement devices and also the high cost.

## Conclusion

Silver nanoparticles (AgNPs) were synthesized using oxidation reduction method, characterization of resulting colloidal AgNPs by FTIR. Aphthous stomatitis is a common and recurrent painful disease of the oral mucous membrane. In this study, silver nanoparticles are showing promising inhibitory effect against Aphthous stomatitis. Moreover, It was found that Silver nanoparticles solution of (20 µg/ml) concentration resulted in a highly significant decrease in the size with a measurable zone of inhibition in both groups female and male patients during the first 24 hours in the cultured samples that isolated from Aphthous stomatitis. Further work is mandatory to investigate the inhibitory mechanism of (AgNPs) against Aphthous stomatitis and also to overcome the lack of measurement devices faced our current study.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding**: Self-funding

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# Evaluation of Serum Leptin, Interlukein–6 and some Biochemical Parameters in Iraq obese Adult Patients

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## Abstract

**Objective:** The current study conducted for evaluating serum level of interleukin-6 and leptin (IL- 6) among Iraqi obese adult people and other biochemical parameters related with obesity. **Methods:** Leptin and IL-6 Levels were assessed in serum samples from 43 Iraqi obese adults and 30 non-obese healthy subjects. **Results:** Significant elevation ($p<0.05$) in $S.Ca^{+}$ levels for obese females as compared to obese males and there is high decrease of significant ($p<0.0001$) in the $S. Ca^{+}$ level for obese male as compared to control male. The liver function enzymes S. GOT S. GPT levels showed significant elevation ($p<0.0001$ and $p<0.01$) in obese female in comparison to their control and a significant elevation appeared at level of cholesterol for both ($p<0.001$ in male) and ($p<0.01$ in female), S LDL $p<0.05$ for obese male and HDL $p<0.0001$ in obese female. Finally, High positive correlation ($p<0.01$) between serum leptin levels for obese subjects and their BMI. Also, IL-6 revealed strong positive correlation ($p<0.01$) with S. TRIG and S. VLDL. Whereas, S.CREAT was positive association at level ($p<0.05$). **Conclusions:** The data revealed effect the obesity in different human body function, liver enzyme, lipid profile and leptin in adult's male in different criteria according to the gender. As well as, the positive correlation between IL-6 with (S. CREAT, S. TRIG and S. VLDL) and leptin with BMI. Increased creatinine related with presence of inflammation or injury to the kidney, which was evidenced by the presence of a positive correlation with IL-6. Obesity effects on lipid profile and liver enzyme and leptin due to the sex hormone differences.

***Keywords:*** *Leptin, IL-6 and obesity; health, toxicity; patients.*

## Introduction

Obesity considered as accumulation of fat in body of human more than needed for the ordinary body functions. Weight gain is a result of accumulation as continue. Obesity had been considered a disease related with behavior, inadequate food intake coupled with relative inactivity. [1]

The body mass index (BMI) is correlated to body fat, and varies with age and sex in children more than it does in adults.[2] There are many risk associated with obesity, metabolic diseases and cardiovascular (CV). [3] Obesity affect on various substance levels produced by adipose tissues i.e. adiponectin, chemokines leptin, factor of tumor necrosis (TNF) and IL-6,.[4] Polypeptide hormone (leptin) is primarily produced and secreted via white adipocyte into the circulation [5]. Correlation as strong exist between mass of body fat and produced and secreted leptin amounts.[6] It is defined as hormone of anti-obesity. Leptin was discovered in 1994[7] as an adipocytokine regulator of body weight, food intake, fat mass, and an important regulator of the immune and neuroendocrine systems. Researchers found a role of crucial in hormonal metabolism and regulation.[8]

Also, adipocytes produced IL-6 an endogenous chemical which is active in inflammation, and in B cell maturation. One-third of total circulating levels are expressed predominantly by adipocytes. Also expressed in macrophages, endothelial cells, skeletal muscle, and fibroblasts.[9] Increase inflammatory mediators, such as C-reactive protein (CRP) and IL-6 in the plasma increases the risk of atherosclerotic complications and acute myocardial infarction.[10] IL-6 is also able to

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influence hormonal balance and some endocrinological abnormalities. It is suggested, that IL-6 may affect the increase of free fatty acids level, and cause lipid abnormalities.[11]

The current study conducted for evaluating serum level of interleukin-6 and leptin (IL- 6) among Iraqi obese adult people and other biochemical parameters related with obesity.

## Patients and Methods

The study was carried out at Alkindy Medical College (Obesity Research and Treatment Unit). During the period January 2017 – July 2017, 43 obese (18 male and 25 female) were referred to the Unit, their age rang 16 – 63 years old. A clinical examination and diagnosis were done for each patient by the consultant medical staff and the biochemical laboratory examination results (FBS, blood urea, serum creatinine, lipid profile, serum GOT, serum GPT, serum calcium and uric acid) were as a routine work. They compared with 30 healthy adults (15 male and 15 female) with approximate age with patients.

### Laboratory methods

Serum isolated from five milliliters vinous blood for each participant. The sera were assessed for IL-6 and leptin by an ELISA kit (Elabscience, USA). The instructions of manufacturer were followed to assess the two variables.

## Statistical Analysis

The results were assessed in a data sheet of SPSS version 20, which was utilized to carry out analysis. The significant differences mean ± SD were assessed by Kruskal-Wallis, Mann-Whitney and Independent-Samples T test and. The correlation between IL-6, leptin and other biochemical parameters were estimated by Person's correlation. A probability **(*P*) value** <0.05 considered as significant.

## Results

Results showed no differences of significant among obese females and males in all parameters except for S. $Ca^{+}$ level which revealed a significant elevation in obese female ($p<0.05$) as compared to the control female Figure 1.

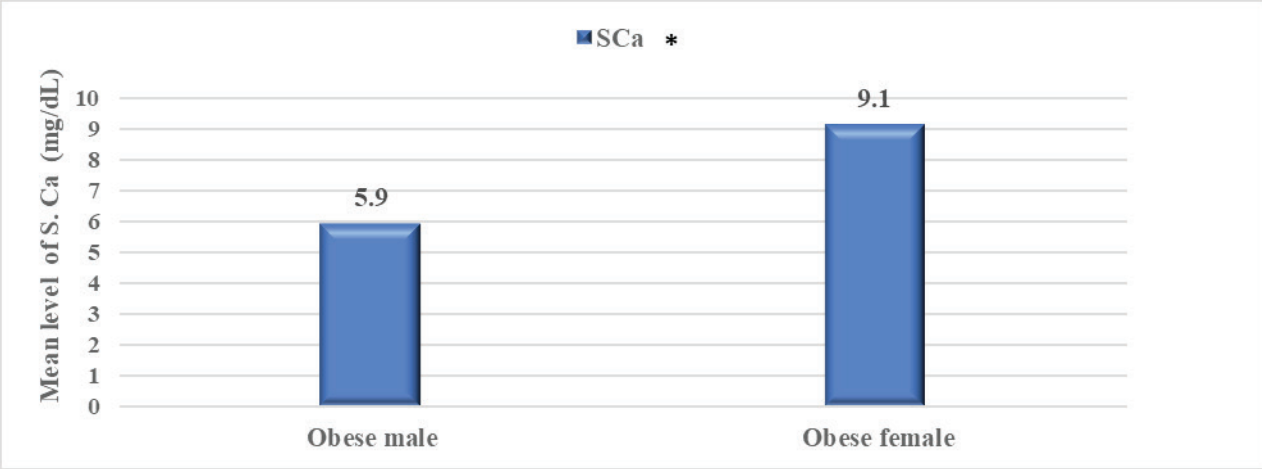


**Figure 1. Serum Calcium (S. Ca) means levels in Obese male *vs*. obese female (*P < 0.05)**

The biochemical parameters involve renal function tests were assessed and there was highly significant decrease ($p<0.0001$) in S. $Ca^{+}$ level for obese male as compared to control male Figure 2A. Whereas no significant differences have been observed in any of these parameters with female studied groups Figure 2B.

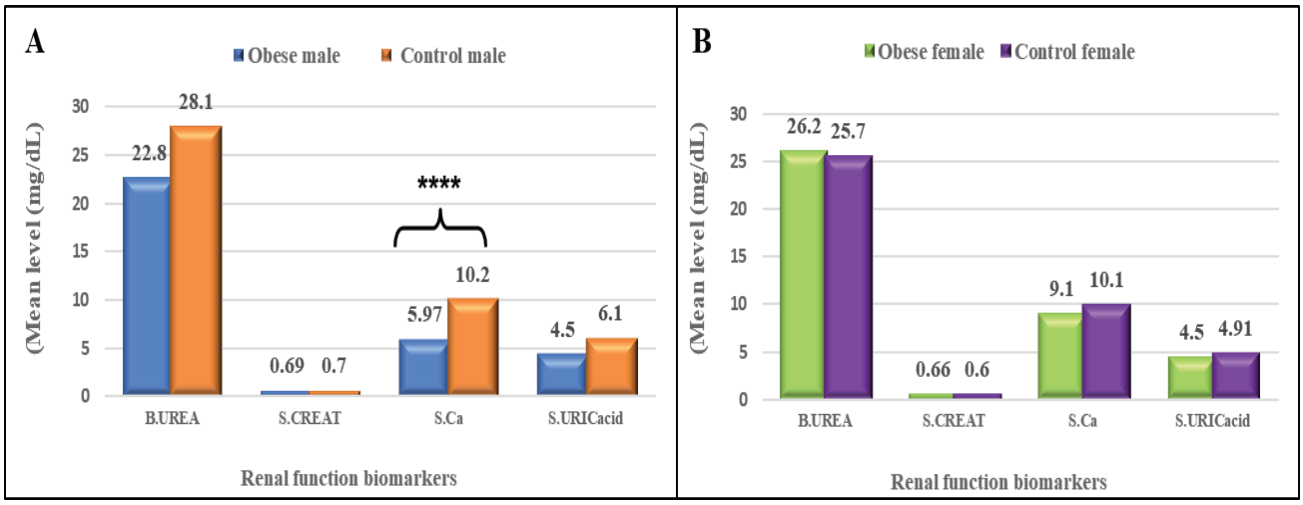


**Figure 2. Renal function biomarker in obese male and female *vs.* their control (****P < 0.0001)**

Lipid profile analysis appeared significantly increase in cholesterol ($p<0.001$ and $p<0.01$) for obese male and female respectively Figure 3. Also, S. LDL elevated significantly in obese male ($p<0.05$) Figure 3A. Whereas, in obese female the significant elevation ($p<0.0001$) was in S. HDL Figure 3B.

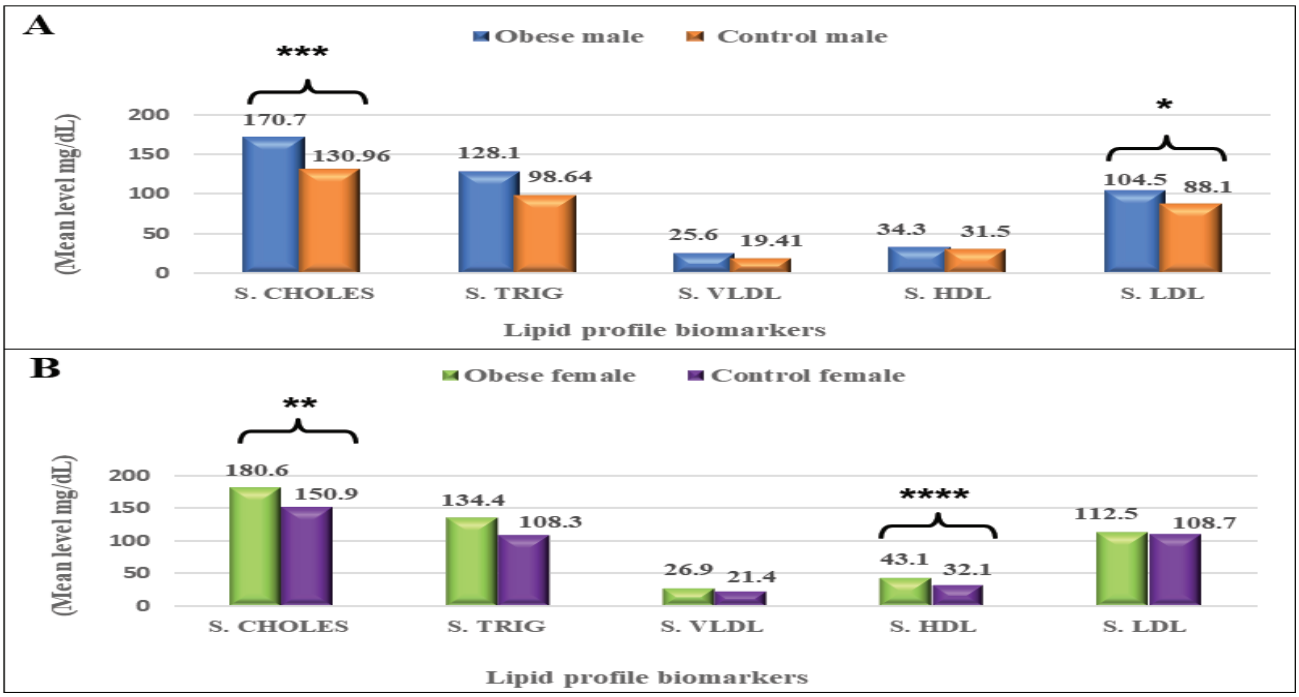


**Figure 3. lipid profile (S. CHOLES., serum cholesterol; S. TRIG serum triglyceride; S. VLDL, serum very low-density lipoproteins; S. HDL, serum high-density lipoproteins; S. LDL, serum low-density lipoproteins) in Obese male and female *vs* their control.( *P < 0.05, **P < 0.01, ***P < 0.001, ****P < 0.0001)**

No differences significant for the two cytokines were observed among obese females and males as compared to their controls, only leptin revealed a significant elevation ($p<0.01$) in obese male as compare to control subjects Figure 4A.

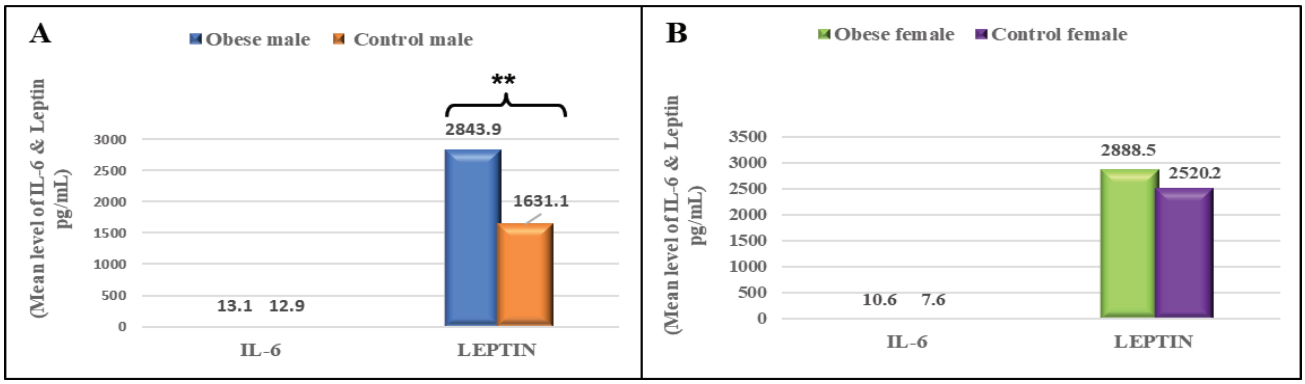


**Figure 4. Leptin and IL-6 in obese females and males *vs* their control (**P < 0.01)**

The IL-6 and Leptin correlation were assessed and the results showed strong positive association p<0.01 between levels of serum IL-6 for obese individuals and (S. TRIG and S. VLDL) and S. CREAT p<0.05. The only positive correlation of Leptin was p<0.01 with BMI.

## Discussion

The present study, showed significant elevation in S. $Ca^{+}$ level in obese females than obese males Figure (1). This is consistent with the study that showed the obesity induces the production of inflammatory cytokines which stimulates bone absorption by osteoclasts that might subsequently lead to a higher serum calcium level in obese people.[12] Another study by.[13] reported that an obesity gene expressed in human adipocytes and the protein produced by this gene stimulates calcium influx and promotes energy storage in human adipocytes by stimulating the expression and activation of fatty acid synthase and inhibiting lipolysis. We also believe that parathyroid hormones (PTH) has effective role in increasing level of calcium in obese people especially females this consistent that PTH of serum is increased abnormally in obese individuals.[14]

In regard to renal functions, no significant differences have been observed between obese subjects and their control except decrease S. $Ca^{+}$ level in obese male as compared to control (Figure 2A). Inverse studies revealed high levels of Ca in blood circulation. The Intracellular calcium which is regulated by calciotropic hormones, which in adipocytes, consequently stimulates high intracellular Ca levels. In adipocytes, Ca high levels cause lipogenesis stimulation and lipolysis inhibition.[12] Others reported that hypercalcemia is associated with vitamin D deficiency in the obese individual.[14] The differences in results may due to the small sample size of obese male.

The increasing in enzyme levels of GOT and GPT were statically significant in obese female but not in obese male when compared with their control Figure 3. Similarly the two enzymes were elevated significantly in obese females having syndrome of polycystic ovary.[15] Inversely, study in Hilla-Iraq population have been indicated no significant differences GOT and GPT in obese and normal individuals.[16], which is consistent with results of obese male Figure 3A.

A significant increment appeared in the level of cholesterol in obese patients for both gender male and in female, S. LDL for obese male as compared to control male Figure 3A and a significant increment appeared in the level of S. HDL for obese female Figure 3B. Other lipid profile parameters ware elevated but statically not significant Figure 3.

The lipids abnormality in obese patients have been diagnosed by[17] including elevated VLDL, non-HDL cholesterol, serum triglyceride, and apolipoprotein B levels. S. TRIG increasing is because of increasing production of hepatic for particles of VLDL and a decline in TRIG rich lipoproteins clearance. Levels of HDL cholesterol are normally low and are linked to the increase in triglycerides of serum. Levels of LDL cholesterol are in range of normal frequently while there is an elevation in small dense LDL.

The different results between genders may depend on the location of the fat tissue in human body, which effect in lipid metabolism. Visceral, subcutaneous, and trunk

(especially upper one) adipose tissue are linked to higher levels of triglycerides and lower ones of HDL cholesterol. In contrast, accumulation fats in subcutaneous tissue is associated with lower triglycerides. The protective effect of leg fat may explain why women and African-Americans have lower triglycerides.[18],[19] Our idea is factors of environmental i.e. activity as physical and factors of dietary influence levels of lipids.[20]

From the results of the present study, level of leptin for obese male appeared highly significant elevated Figure 5A and was non-significant in obese female Figure 4B. In agreement with our results leptin significantly was higher in male and has a significant positive correlation with BMI.[21] Whereas, study in obese men displayed that leptin levels and percentage body fat correlate positively, and obese men therefore have elevated in serum leptin levels.[22] The abnormal accumulation of adipose tissue will cause change and increment in leptin level.[23] Inverse results regarding to the obese women, Study in Pakistan revealed significant increase of leptin in obese female than in obese male. [24] Jenks MZ *et al.* demonstrated that 17β-estradiol increased the abundance of transcript leptin and increase secreted leptin in murine adipocytes.[25] Variation in circulating estradiol concentrations may have an influence on circulating leptin in female subjects.[26] The increased concentration of serum leptin are significantly associated with obesity in postmenopausal women. [27] Hormones of sex are associated significantly along adiposity, and the androgens associations qualitatively vary according to sex. Heterogeneity might help explaining the sex hormones contribution complexity to differences in sex in cardio-obesity.[28]

IL-6 level was statically not significant in our data. Contrary to many studies, augmentation of TNF-α and IL-6 levels is more in obese than in nonobese diabetics patients.[29] Circulating levels of IL-6 and leptin were significantly increased in obese patients than in controls. [30] A significant increment have been observed of IL-6 expression in obese subcutaneous adipose tissue biopsies when compare with lean individual.[31] The controversial results my due to IL-6 secretion is regulated via many pathologic or physiologic factors: cytokines, hormones, diet, stress, hypoxia, physical activity, and others. [32]

Finally, there was highly positive correlation between IL-6, S. TRIG and S. VLDL and the level of IL-6 in obese were similar to healthy controls subjects. Many studies revealed Overproduced IL-6 minimized levels of blood lipid via elevating VLDLR expression in different tissues. They concluded that blockade of IL-6 normalizes levels of reduced lipid due to IL6, but does not influence metabolism of normal lipid.[33]

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest**: Non

**Funding**: Self-funding

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# Estimation The Scavenging Activities of Ascorbic Acid, Uric Acid, Gallic Acid and GSH to DPPH Radical

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## Abstract

The "α,α-diphenyl-β-picrylhydrazyl radical **(**DPPH)" method from the estimation methods to determine the antioxidants activity in vitro, through the lowering the absorbance of DPPH with color changing from violet into yellow with increasing the strength of antioxidants activity. So, the results of this study show the uric acid is the strongest scavenging, then ascorbic acid when compared with other compounds used. But the reduced glutathione is the weakest although has acidic hydrogen.

***Keywords:*** *DPPH, scavenging activity, antioxidants, Ascorbic Acid, Uric Acid, Gallic Acid.*

## Introduction

The efficiency of antioxidants (scavenging activity) depends on the ability of free radicals scavengers (FRS) to given hydrogen to the free radicals [1]. The increase in rate and energy promotion for hydrogen ion transition from FRS to free radicals depend on the lowering in energy level for hydrogen bond with FRS. Efficient FRS results free radicals after donating hydrogen but not react rapidly with oxygen to produce superoxide. The efficiency of FRS as well depends on other factors as volatility, pH sensitivity and polarity [2].

In the present study, the antioxidants involve such as vitamin C, uric acid, gallic acid, and reduced glutathione.

**Ascorbic acid (AA):**

One from most powerful FRS [3,4]. It is found in several plants cells types. AA present in the reduced form under physiological conditions (90% of the ascorbate pool) in plants leaves and chloroplasts [5], were the concentration of AA (20 mM) in the cytosol, and (20-200 mM) in the chloroplast stroma [6]. The ability of AA to give the electron by many enzymatic and nonenzymatic reactions, therefore act as main detoxification antioxidants against ROS in the aqueous phase. So, the AA can directly be scavenging for singlet oxygen, superoxide radical, hydroxyl radical and reduced hydrogen peroxide to water by ascorbate peroxidase reaction [7].

AA capable to reduce tocopheroxyl radical into tocopherol that responsible about cell membrane protection. AA performs a number of non-antioxidant roles in the cells. It has been involved in the regulation of cell cycle progression from G1 to S phase, cell division, and cell elongation [8,9].

**Glutathione (GSH):**

"Tripeptide glutathione (□glutamylcysteinylglycine)" is a plentiful compound in the tissues of plants. It is found in all compartments of the cell such as cytosol, mitochondria, and endoplasmic reticulum [10], were GSH has many roles in organisms such as storage for the sulphur, serve as precursors for phytochelatins, act as a detoxifier for xenobiotics via GSH-conjugation [11,12], and maintenance about redox form of the cellular membrane through (GSH-GSSG) system. Also, GSH has the ability to regulate gene expression. And regulation of cell cycle by GSH/GSSG system through -SH group [13,14].

GSH act as antioxidants through the nucleophilic center of –SH residue that responsible for higher reductive potential. So, its scavenger for singlet oxygen,

superoxide radical and hydroxyl radical by non-enzymatic reactions, and with hydrogen peroxide and reducing to water by an enzymatic reaction [15]. GSH has the ability to regenerate others antioxidants such ascorbic acid through the ascorbate-glutathione cycle [16,17].

Uric Acid (UA):

The final product of purine degradation in human and "Great Apes". It is a powerful scavenger for free radical such as singlet oxygen, hydroxyl radicals (.OH), and peroxyl radicals (RO. 2) [18,19]. In blood, stream urate considers from the major antioxidants against oxidative damage, so it is protected RBCs membrane from lipids peroxidation by scavenging oxygen radicals in aqueous media [20]. Uric acid some of the deleterious reactions, such as peroxide production by macrophages or autoxidation of haemoglobin [21].

In contrast, elevated the UA causes a lot of number from the epidemiology of hypertension [22], cardiovascular disease [23], visceral obesity [24], dyslipidemia [25], insulin resistance [26], kidney disease [19].

Gallic Acid (GA):

"GA is a 3,4,5-trihydroxybenzoic acid and its derivatives are widely spread in the plant kingdom and is a large family from secondary polyphenolic metabolites" in plants so it is from natural antioxidants [27]. GA present either methylated gallic acid form such as syringic acid, or in the orgalloyl conjugated form with catechin derivatives as "flanvan-3-ols, or in polygalloyl esters" form with glycerol, quinic acid or glucose [28].

The last two groups from "polyphenols are known as vegetable tannins, which their names derived from its ability to transform animal skins into leather" through the with collagen [29]. GA from the components of tea and some types of GA used as food additives to prevent peroxidation. Also, it is used in many phytomedicines due to its biological and pharmacological activities through the ability to free radicals scavenger [30], inducing apoptosis for the cancer cells [31,32], and inhibiting squalene epoxidase interfering the signal pathways involving calcium [33,34].

**α,α-diphenyl-β-picrylhydrazyl radical (DPPH):**

DPPH is described as relatively stable free radical due to delocalization phenomenon for the unshared electron overall whole molecule, so this radical do not suffer from dimerization as other radicals. The delocalization gives this radical the deep violet color when dissolved in absolute ethanol and absorbed at 517 nm. DPPH used to estimation the antioxidants activity for any sample or free radicals scavenging material [35].

**Material and Methods:**

**Prepared Serial Solutions:**

**Prepared Ascorbic acid solutions:**

This is done by dissolving ascorbic acid in distilled water (D.W.) as the following concentrations: 2.5, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70 mg/dl.

**Prepared GSH solutions:**

This is done by dissolving GSH in distilled water (D.W.) as the following concentrations: 2.5, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70 mg/dl.

**Prepared UA solutions:**

This is done by dissolving UA in distilled water (D.W.) (pH 8.5) as the following concentrations: 2.5, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70 mg/dl.

**Prepared GA solutions:**

This is done by dissolving GA in absolute ethanol as the following concentrations: 2.5, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70 mg/dl.

**DPPH procedure:**

**DPPH preparation:**

Prepared 0.1 mM from DPPH, by dissolving appropriate weight in absolute ethanol.

**Principle of method:**

The principle of this method depends on the reduce the absorbance values of DPPH after addition the sample due to conversion the violet colour into yellow colour depending on the antioxidants activity of the sample.

The colour intensity measured at 517 nm (36) (figure 1).

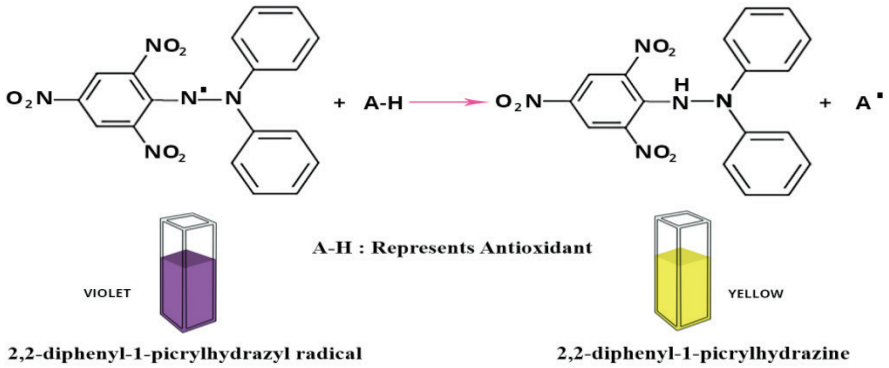


**Fig. 1: Reduction effect of AH to DPPH.**

**Procedure:** The procedure of addition as following:

| Reagent | Sample/µl | Blank/µl |
|---|---|---|
| DPPH | 1000 | 1000 |
| Sample | 100 | ------- |
| D.W. | ------- | 100 |

Incubate for 20 min at 25ºC. In the dark condition, then read the absorbance at 517 nm.

## Results and Discussion

The following results (Table 1) and (Figure 2) the inhibition values of DPPH by the antioxidants compounds. In other words, the absorption values for DPPH after scavenging by ascorbic acids, GSH, UA, and GA.

**Table 1: Absorption values for DPPH after scavenging by UA, GA, GSH, and ascorbic acid.**

| Concentration (mg/dl) of U.A, Gallic acid, GSH, Ascorbic acid | UA | Gallic acid | GSH | Ascorbic acid |
|---|---|---|---|---|
| 2.5 | 0.302 | 0.323 | 0.352 | 0.314 |
| 5 | 0.289 | 0.321 | 0.352 | 0.292 |
| 10 | 0.280 | 0.320 | 0.351 | 0.288 |
| 15 | 0.275 | 0.315 | 0.344 | 0.286 |
| 20 | 0.269 | 0.311 | 0.344 | 0.280 |
| 25 | 0.259 | 0.310 | 0.344 | 0.279 |
| 30 | 0.251 | 0.303 | 0.343 | 0.274 |
| 35 | 0.247 | 0.291 | 0.343 | 0.268 |
| 40 | 0.243 | 0.290 | 0.343 | 0.261 |
| 45 | 0.238 | 0.289 | 0.332 | 0.254 |
| 50 | 0.211 | 0.262 | 0.332 | 0.238 |
| 55 | 0.193 | 0.249 | 0.332 | 0.226 |
| 60 | 0.169 | 0.232 | 0.332 | 0.212 |
| 65 | 0.145 | 0.221 | 0.332 | 0.195 |
| 70 | 0.123 | 0.214 | 0.332 | 0.185 |

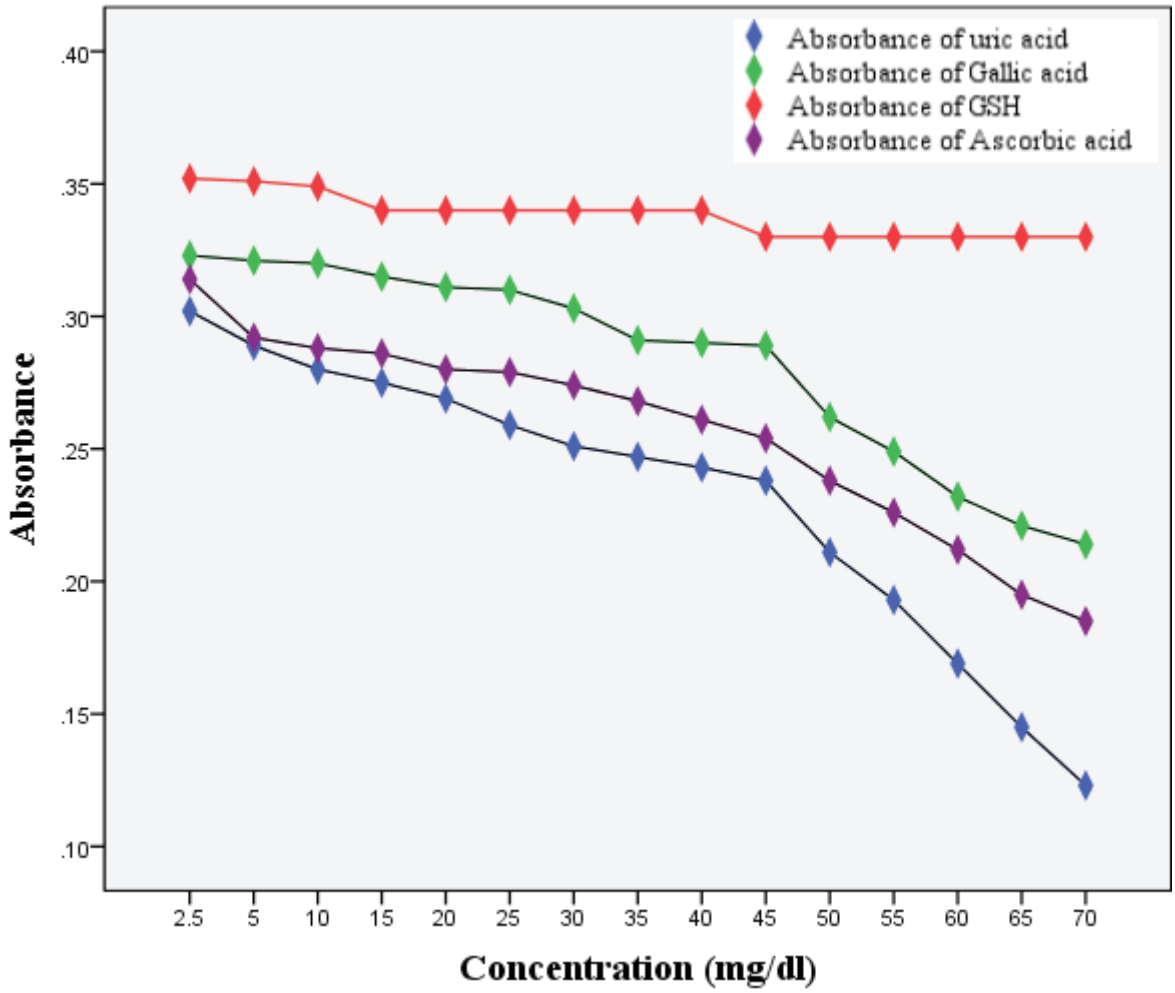


**Fig. 2: Decline in absorption values for DPPH after scavenging by UA, GA, GSH, and ascorbic acid.**

The scavenging effect for UA toward DPPH is more than other antioxidants were used in this study when compared in the same concentrations, may be due to the heterocyclic ring effect that responsible about delocalization and lowering energy of hydrogen bond with the compound (figure 3).

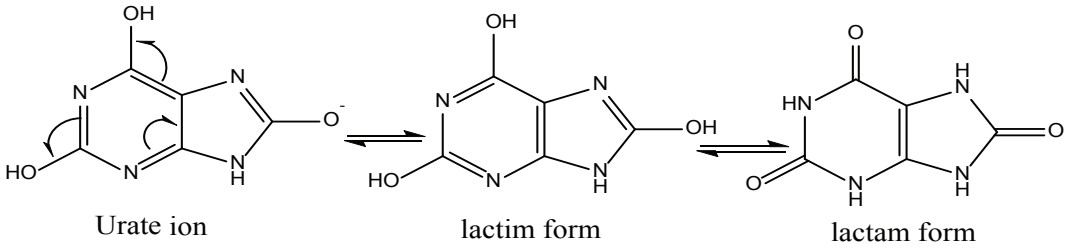


**Fig. 3: Urate tautomerism**

From the results show a slight decrease in the line chart (figure 2) for the GSH value, this means it is the weakest scavenging compared with other compounds used in this study may be due to the energy bond of hydrogen in the thiol group is relatively strongest than other compounds, therefore no change in the color of DPPH. However, the scavenging effect increased with an increase in concentrations of these antioxidants compounds.

Conclusion:

In conclusion, the strongest scavenging in vitro the compounds that have the ability to reduce the DPPH and change its the color from violet into yellow, therefore the scavenging strength follow the sequence UA, AA, and GA, where the GSH is very weakest scavenging to DPPH at the same concentrations.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest**: The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# Frequency of Aspirin Misuse among Hypertensive Patients in Babylon Province

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## Abstract

**Background:** Hypertension endangering a risk of cardiovascular events and BP reduction will reduce such complications. the role of aspirin in hypertension is debated, however it is advised in primary prevention in case of patient with high risk factors assessed by one of the cardiovascular risk calculator, a state in which the benefit of aspirin outweigh the risk of complications.

**Objectives:** Estimate the prevalence of aspirin misuse in hypertensive patients ,which population at risk and estimate the possible source of this misuse habit.

**Patients and Methods:** A cross sectional study that has been conducted in babil city major hospitals for the period from the 20th of January to 2nnd of May. our study sample included 353 patients all cases were between 35 to 75 years old who attend to internal medicine outpatient clinic , emergency departments and inpatients of the above hospitals . All patient had hypertension being treated with antihypertensive agents and they did not experience any vascular events like CVA, IHD and PVD**.**

**Results:** 30.59% of patient do not use aspirin and 64.31 % of patients use aspirin prescribed by doctors. Most of aspirin use was according to doctor advice( 92.7%). 5.1 a use aspirin by advice from others. Aspirin use was more with increased age group (p value 0.003) and in females( p value is 0.04). No significant differences between educational level, economic status, residency and occupation with the use of aspirin. Regarding aspirin intake by their doctors and score <10 %: women were more than men ,age 40 – 60 years. Mostly were urban, higher education of 50% had positive history of CVD. Patient who need aspirin but they didn't use aspirin, were 66 patients mostly male live in urban area higher education , smoker , most of them had no family history of cardiovascular diseases.

**Conclusion:** Aspirin use requires coordinated interaction between patient and physician with encouraging the importance patient education about aspirin use, side effects and CVD risk and proper evaluation of patients risk factors and stratification using simplified charts accessible in health centers.

***Key words:*** *Aspirin, primary prevention ,hypertension*

## Introduction

The CVD risk associated with hypertension depend on multiple factors including age, gender, in addition to BW ,physical activity, cigarrete smoking, family history of hypertension , high cholesterol level, DM and preexisting vascular disease(1). Assessment of the risk of future CVD is an important step in patients requiring primary protection from any vascular events(2) . However, to determine the role of aspirin's in prevention of CVD, both primarily and secondarily the benefits should be balanced against the complications(3).The net benefit of aspirin in patients with known risk factors is clearly evident(4) . For primary protection ,guidelines vary about whether, and to which groups, aspirin is to be given(5) in that context, physicians should evaluate the risks and benefits of aspirin therapy for those patients free of risk factors (6)

Primary cardiovascular (CV) prevention defined as the use of pharmacological and/or nonpharmacological measures as prophylaxis of atherosclerosis to prevents

MCEs in in the absence of any history or clinical signs of underlying disease. The main outcomes to be measured are MI, stroke, and death from CVD. In addition to other outcomes including hospital admission , intervention of coronary disease, incident angina, all-cause mortality are sometimes added as ancillary end points these are applied to apparently healthy persons[7].

For the calculation of an individual probability to develop CVD all factors that contribute to the risk must be taken into account, including previous CVD events[8]. Many risk calculators are currently available that help in the detection of population at risk of developing CHDs[9].

## Patients and Method

A cross sectional descriptive study was conducted in Babylon city hospitals including al hila teaching hospital, marjan medical city and imam al sadiq teaching hospital. For the period from the 20th of January to 2nnd of May. This study has been done on patients diagnosed by their doctor having high blood pressure and take medication for it.

The data was collected using a preformed questionnaire by which the patient was interviewed after giving appropriate verbal consent .Each patient was interviewed for about 15 minutes

The questionnaire include the following Parts : Patient sosciodemographic characters (age, gender, residency, educational level, economic status, occupation and marital status,the parameters related to 10 years cardiovascular risk score, the protocol of study was approved by ethical committee of Babylon university, college of medicine. Appropriate verbal consent was taken from the patients before the interview. Confidentiality of patients data was approved by replacing names by numbers. To accomplish the study official agreement was taken from Babylon health directorate.

## Results

Table (1) shows the sociodemogrphic distribution of the study sample and the association with the habit of taking aspirin. The association between the age group and the use of aspirin was significant in which p value was 0.003. In which aspirin use was more with increased age group, also the association between gender and use of aspirin was significant when aspirin use was more in females p value is 0.04.

**Table (1): The association between sociodeogrphic characteristics of the patients and aspirin taking.**

| Characteristic | Group | Use Aspirin | Not users | P value |
|---|---|---|---|---|
| Age | up to 40 years | 4 (80.0%) | 1 (20.0%) | 0.003* |
| | 41-60 years | 144 (63.2%) | 84 (36.8%) | |
| | more than 60 years | 97 (80.8%) | 23 (19.2%) | |
| Gender | male | 159 (66.0%) | 82 (34.0%) | 0.04* |
| | female | 86 (76.8%) | 26 (23.2%) | |
| Residency | urban | 206 (69.1%) | 92 (30.9%) | 0.792 |
| | rural | 39 (70.9%) | 16 (29.1%) | |
| Education | no or primary education | 74 (68.5%) | 34 (31.5%) | 0.810 |
| | medium or high education | 171 (69.8%) | 74 (30.2%) | |
| Occupation | employed | 98 (65.3%) | 52 (34.7%) | 0.157 |
| | worker | 66 (68.0%) | 31 (32.0%) | |
| | no job | 81 (76.4%) | 25 (23.6%) | |
| Economic status | good | 192 (66.9%) | 95 (33.1%) | 0.051 |
| | fair | 46 (78.0%) | 13 (22.0%) | |
| | not enough | 7 (100.0%) | 0 (.0%) | |

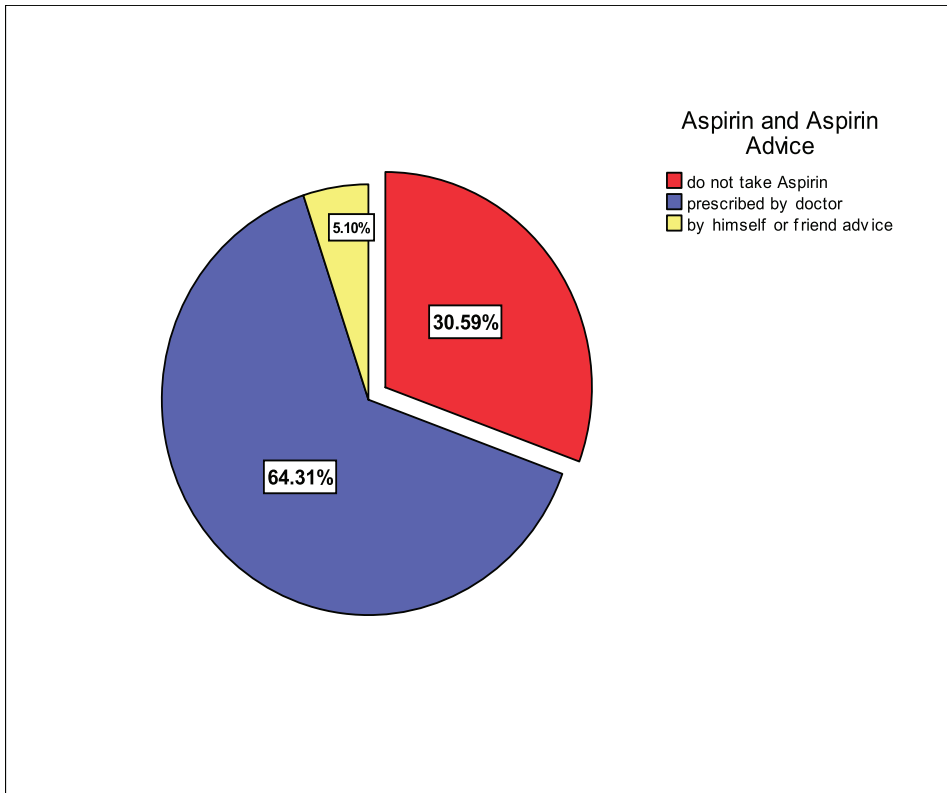


**Figure (1): Distribution of Aspirin prescription in total sample**

**Table(2) Sociodemographic distribution of aspirin misuse by doctor prescription.**

| Characteristic | | Group | frequency | percent | total |
|---|---|---|---|---|---|
| Age | | 41-60 years | 24 | 63.2 | 38 |
| | | more than 60 years | 14 | 36.8 | |
| Gender | | male | 18 | 47.4 | |
| | | female | 20 | 52.6 | |
| Residency | | urban | 21 | 55.3 | |
| | | rural | 17 | 44.7 | |
| Education group | | no or primary education | 17 | 44.7 | |
| | | high education | 21 | 55.3 | |
| Occupation | | employed | 9 | 23.7 | |
| | | worker | 14 | 36.8 | |
| | | no job | 15 | 39.5 | |
| Marital status | | married | 29 | 76.3 | |
| | | single | 9 | 23.7 | |
| Family history of hypertension or other CVD | | 19 | 50.0 | 50.0 | |
| | | 19 | 50.0 | 50.0 | |
| Diabetic | yes | 8 | 21.1 | 21.1 | |
| | no | 30 | 78.9 | 78.9 | |
| smoker | yes | 5 | 13.2 | 13.2 | |
| | no | 33 | 86.8 | 86.8 | |

**Table(3)Sociodemographic distribution of aspirin misuse by patients.**

| Characteristic | | Group | frequency | percent | total |
|---|---|---|---|---|---|
| Age | | Up to 40 years | 4 | 44.4 | 9 |
| | | 41-60 years | 5 | 55.6 | |
| Gender | | male | 5 | 55.6 | |
| | | female | 4 | 44.4 | |
| Residency | | urban | 9 | 100.0 | |
| Educational level | | high education | 9 | 100.0 | |
| Occupation | | employed | 9 | 100.0 | |
| Marital status | | married | 7 | 77.8 | |
| | | single | 2 | 22.2 | |
| Family history of hypertension or other CVD | | yes | 9 | 100.0 | |
| Diabetic | yes | 7 | 77.8 | | |
| | no | 2 | 22.2 | | |
| smoker | yes | 2 | 22.2 | | |
| | no | 7 | 77.8 | | |

**Table(4)Sociodemographic distribution of non-user**

| Characteristic | | Group | frequency | percent | total |
|---|---|---|---|---|---|
| Age | | Up to 40 years | 1 | 1.5 | 66 |
| | | 41-60 years | 46 | 69.7 | |
| | | More than 60 years | 19 | 28.8 | |
| Gender | | male | 51 | 77.3 | |
| | | female | 15 | 22.7 | |
| Residency | | urban | 56 | 84.8 | |
| | | rural | 10 | 15.2 | |
| Educational level | | high education | 45 | 68.2 | |
| | | no or primary education | 21 | 31.8 | |
| Occupation | | employed | 30 | 45.5 | |
| | | worker | 19 | 28.8 | |
| | | No job | 17 | 25.8 | |
| Marital status | | married | 56 | 84.8 | |
| | | single | 10 | 15.2 | |
| Family history of hypertension or other CVD | | yes | 28 | 42.4 | |
| | | no | 38 | 57.6 | |
| Diabetic | yes | 32 | 48.5 | | |
| | no | 34 | 51.5 | | |
| smoker | yes | 46 | 69.7 | | |
| | no | 20 | 30.3 | | |

## Discussion

Hypertension causes cardiovascular and renal. Thus decreasing blood pressure reducing morbidity and mortality. The effect of aspirin on control of BP is still a matter of debate[10]. Regarding the use of aspirin in healthy or apparently healthy people as primary prevention , there are no direct proofs of its efficacy, but in low-risk populations it may be of no benefit or may be risky[7]. In 2016, the (USPSTF) recommendations about aspirin use in primary CVD prevention in has been updated . (11).They adopted a calculator derived (ACC/AHA) for assessment of 10-year risk for first hard atherosclerotic CVD event (non-fatal MI,CHD, death, and fatal or nonfatal stroke)[12].

The study dealt with patients sociodemograhpic characteristics and its association with the habit of aspirin use. The age and the use of aspirin was significantly associated, in which aspirin use was more with increasing age , in those whose ages more than 60 years (120 patients) 97 of them taking aspirin p value 0.003. In a study conducted in Canada that prospectively enrolled 3015 patients without any previous CVS diseases for aspirin use as primary protection , when compared with their counterparts, the study found that , peoples receiving aspirin were older their ages in years was 61.6±8.4 vs. 55.5±8.1 with ($P<0.0001$)[13]

A significant association was also found between gender and use of aspirin in which aspirin use was more in females patients with p value is 0.04. A similar results was found by a study of mendy et al in USA on the aspirin use in primary protection in patients without prior CVS diseases, they found that aspirin use was more in female(45.9% ) than in male(39.1% )[14] .This may because of female in our communities look for and afraid more about their health status. The study found that there was no significant differences between educational level, economic status, residency and occupation with the use of aspirin. P value > 0.05.

The study evaluate the relationship of the effect of the score value of the patients and the indication of aspirin use according to score. From the total number of the patients taking aspirin ,19.2 % of them regarded as a misuse of aspirin , which include 17.6 % whose score is below 10 and their age is more than 40 years, and 1.6 % include patients with age below 40 years that is age not assessed by the score. 80.8 % of patients taking aspirin according to score. These findings were approximately similar to a study done by Vanwormer and his associates was done to find

the relationship between; specific sociodemographic variables, and aspirin use among a representative sample of Wisconsin adults without CVD, and found that the percentage of regular aspirin intake in those without indication to take it was 18% (102 patients from the **563** patients) [15].

This study evaluated the distribution of patient who take aspirin prescribed by their doctors and their risk score was less than 10 %. Women were more than men and age between 40 – 60 years most of them were urban with medium to higher education half, of them had positive family history of cardiovascular diseases. In a study done by Vanwormer and his associates, they concluded that Aspirin intake was less by patients at high CVD risk which may have a cardiac protection effect from regular use of aspirin and excessive use in patients at low CVD risk. (15). These findings may be due to our patients themselves not complying with their following physician instruction or visiting not a specialist medical physicians with limited knowledge about the risk assessment. So to make any decision for aspirin prescription should fellow an individual clinical judgment that balance the benefits of cardio protection and bleeding risk. Patients with a higher CVD risk, have a greater benefit from aspirin. This final judgment to start aspirin therapy continuously should be made by health care personnel's , especially Primary Care Physicians (PCPs) in resource-poor areas, and they must have a knowledge about their role in assessing the benefit and risk of bleeding. [16]

The study show the distribution of patient who take aspirin. which included 5 patients their risk score was less than 10 %, and 4 patient had not included in the score whose age below 40 years. Male were predominant live in urban area, all of them were highly educated employed, also most of them had history their family of CVD, this is may be due to educated people be more aware about cardiovascular diseases. In the study of roth et al, performed in an urban county African –Americans and Hispanic adults where the quality of health care delivery should be high , they found that aspirin intake

was insufficient with high risk patients for CVD and routinely used by many patients at low CVD risk [17].

This study shows the distribution of patient who need aspirin but they didn't use aspirin , they were 66 patients mostly male live in urban area.

higher education , smoker , most of them had no family history of cardiovascular diseases. In a study done by Im et al which was conducted for assessment of the 10-year (CVD) risk and to set for the application of the current requirement on aspirin use for primary protection in Korean participants, and according to 2016 recommendation of (USPSTF), aspirin in their study was indicated in 266 participants (23.6%), but only 44 participants of them (3.9%) were on regular intake of aspirin . Among these who participates in their study, aspirin was prescribed in proper way in 36% of the participants, suggesting that only 6% of the participants were taking aspirin appropriately and 3.3% of them were taking aspirin inappropriately [18]

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest**: The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# Estimation of Antioxidants Activity Through DPPH Inhibition Levels In Patients with Chronic HPV 16 Cervicitis

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## Abstract

In the present study, the DPPH scavenging activity from the primary methods to estimation the antioxidants activity in the body by an inverse relation between them. So, the levels of DPPH scavenging activity is reduced in the patient with HPV16 genotype chronic cervicitis (G3= 43.01±2.74 in the serum, G3= 9.73±1.53 in the mucus) and without (G2= 47.22±4.50 in the serum, G2= 15.51±1.41 in the mucus)compared with healthy women (G1= 64.79±4.87 in the serum, G1= 21.24±3.62 in the mucus), this is a return to lowering antioxidants in the patients compared with healthy women. The deterioration in the antioxidants levels can cause cancer in the future or delay the response of the medication to inflammation.

***Keywords:*** *DPPH, Antioxidants activity, Chronic cervicitis, HPV, cervical cancer.*

## Introduction

Chronic cervicitis from the widespread diseases in gynecology, caused by delayed treatment or diagnosis [(1,2)]. From the clinical symptoms for this disease include abnormal vaginal discharge, lower genital pain and constant lochia. chronic cervicitis occurs due to infected cervical by a pathogen [(3,4)]. Human papillomavirus (HPV) is a common pathogen that causes chronic cervicitis. The high-risk HPV (HR-HPV) is more than 180 genotypes that cause squamous epithelial hyperplasia because of the DNA of HR-HPV have the ability to synthesis oncoproteins that cause inhibition to tumor suppressor proteins such as "p53 and retinoblastoma protein (pRb)". So, the infected by HR-HPV can lead to "cervical intraepithelial neoplasia" or cervical precancerous lesions [(5,6)].

The chronic infection accompanied by increased free radicals and pro-oxidants, that have harmful effect to biological systems such as lipids, proteins and DNA, that cause ageing, cardiovascular disturbances, diabetes, and cancer [(7)]. While the antioxidants are the compounds, act as free radicals scavenging either by prevention or conversion mechanisms [(8)]. These antioxidants produced internally in living organs or intake by foods [(9)].

α,α-diphenyl-β-picrylhydrazyl (DPPH) is described as a stable free radical due to delocalisation electron overall whole molecule (Figure 1). therefore keep this molecule from dimerization. The DPPH from the mainly methods to evaluation of antioxidants activity for the biological systems [(10)].

## Material and Method

**Study design:**

The study design is a comparative study for healthy, chronic cervicitis patients with positive HPV 16 genotyping, and patients without HPV.

**Sample collection:**

HPV 16/18 genotyping detection by real-time PCR by taken specimens as tissues by cervical scraping and as Pap smear with mucus by the physician in the hospital Imam Sadiq and maternity hospital and children in Babil province, where keeping in (2 ml) from phosphate buffer solution (PBS), in addition to serum for the same persons. The specimens collected depend on the criteria of chronic cervicitis such as age, number of pregnancy or abortion, infection delay, smoking, vaginal bleeding, lower abdominal pain and vaginal pH.

**Sample size calculation:**

The sample size calculated by applying the following equation [11]:

$$n = Z^2 P (1 - P)/d^2$$

Where Z refer to Z-score (equal 1.65), d is the absolute marginal error equal 10%, P is the population (number of women that have cervicitis and undergo to cervical screen equal 8%), therefore the number of samples equal to twenty for each group, but have been taken more than 20 for the chronic cervicitis without HPV 16/18 and healthy control (Table 1). The samples were collected for a period of six months.

**Table 1: Groups classification.**

| Groups | Description | No. of the patients |
|---|---|---|
| G1 | Women with chronic HPV16/18 cervicitis | 20 |
| G2 | Women with chronic cervicitis | 40 |
| G3 | Healthy women | 40 |

**Viral DNA extraction:**

Depended on viral gene-spin DNA extraction kit, can be extracted DNA and prepared to real-time PCR.

**Real-time PCR procedure:**

Have been used Bosphore HPV genotyping kit for real-time PCR to detect HPV 16/18 genotypes [12,13].

**DPPH procedure:**

Principle:

DPPH has violet colour due to this delocalisation when dissolved in ethanol and absorbed at 517 nm. This radical can accept a hydrogen atom from antioxidants to reduce the colour intensity from violet to yellow colour depending on the antioxidants power (Figure 1).

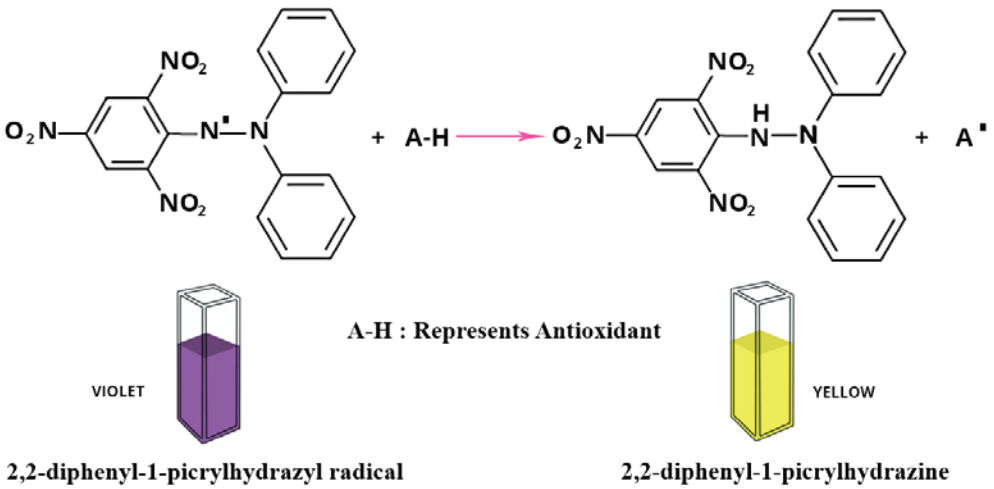


**Fig. 1: DPPH reaction with A-H.**

**Procedure:**

With minor modify prepared the reagent 1 (R1), DPPH (0.1 mM) in absolute ethanol, and control from ascorbic acid (20 mg/dl), then the following steps [14]:

| Reagent | Sample/µl | control/µl | Blank/µl |
|---|---|---|---|
| R1 | 1000 | 1000 | 1000 |
| Serum | 100 | ------- | ------- |
| Control | ------- | 100 | ------- |
| D.W. | ------- | ------- | 100 |

wait for 20 min at 25ºC. within dark condition, read absorbance at 517 nm. The results can be calculated by the f ollowing relation:

## Statistical Analysis

The data were entered into SPSS program version 23 to get on the variables as mean, standard deviation (SD), standard error (S.E), confidence interval and "one-way ANOVA. A p value of ≤ 0.05 was considered to be significant".

## Results and Discussion

The results for the sixty women that undergo to cervical screen represented only twenty from the patients that suffer from the symptoms that related with chronic cervicitis have HPV positive of 16 genotype only according to real-time PCR results as showing from the amplification plot (Figure 2). Where another forty also have chronic cervicitis but due to other causes than HPV 16/18 genotyping.

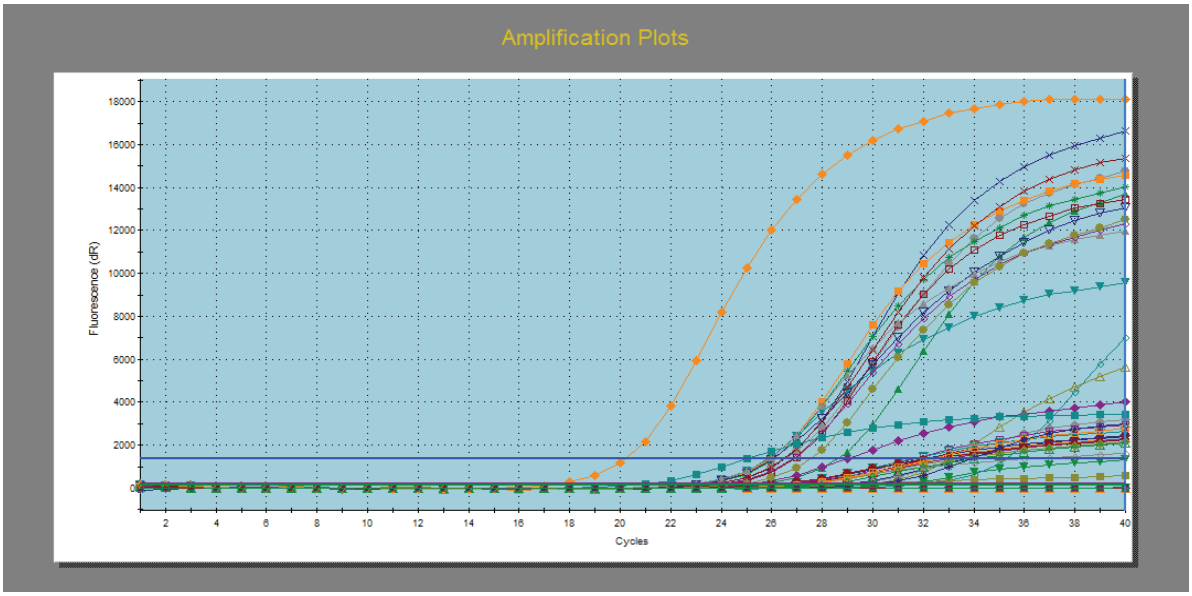


**Fig. 2: Amplification plots of real-time PCR.**

The DPPH results represented in (Table 2), were the results in G3 show the significant decrease in DPPH scavenging compared with G1, and G2 compared with G1, also in G3 compared with G2.

**Table 2: DPPH scavenging activity.**

| Groups | | DPPH scavenging % (Mean ± SD) | S.E | Confidence Interval 95% | | P-Value |
|---|---|---|---|---|---|---|
| | | | | Lower | Upper | |
| G1 | Serum | 64.79±4.87 | 0.77 | 15.6187 | 19.5068 | .000 |
| | | | | 19.3968 | 24.1588 | .000 |
| G2 | | 47.22±4.50 | 0.71 | -19.5068 | -15.6187 | .000 |
| | | | | 1.8341 | 6.5960 | .001 |
| G3 | | 43.01±2.74 | 0.61 | -24.1588 | -19.3968 | .000 |
| | | | | -6.5960 | -1.8341 | .001 |
| G1 | Mucus | 21.24±3.62 | 0.57 | 4.5929 | 6.8647 | .000 |
| | | | | 10.1120 | 12.8945 | .000 |
| G2 | | 15.51±1.41 | 0.22 | -6.8647 | -4.5929 | .000 |
| | | | | 4.3833 | 7.1657 | .000 |
| G3 | | 9.73±1.53 | 0.34 | -12.8945 | -10.1120 | .000 |
| | | | | -7.1657 | -4.3833 | .000 |

The investigations of this results may be due to the chronic infection in cervix cause increased the number of leukocytes in the location (mucus) of inflammation and this lead to elevated levels of reactive oxygen species (ROS) such as superoxide and hydrogen peroxide to destroy the microorganisms that cause this inflammation such as HPV, bacteria or fungi. Also depletion of antioxidants in the immunity defense process.

Moreover, there are found significant lowering in G3 compared to G2, because of the viral cause desquamation for the epithelial tissues in chronic cervical infection and maybe cause epithelial cells necrosis, then increase electron leakage from the mitochondria and depleted the antioxidants. Therefore, the lowering antioxidants in the body (serum) or cells lead to reduce the ability to scavenging DPPH compared with healthy persons.

## Conclusion

In brief, DPPH scavenging activity from the primary methods to estimation the antioxidants status of the body. In the patients show the lowering in the antioxidants due to inflammation compared with healthy women. The deterioration in the antioxidants levels can cause cancer in the future or delay the response of the medication to inflammation.

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# Postoperative Hypothermia in Surgical Patients at Azadi Teaching Hospital

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## Abstract

**Introduction:** The sensation to cold, shake occurrence and shivering are events that are commonly developed following general anesthesia administration postoperatively. Hypothermia has been considered as the most frequent outcome of surgery underwent by anesthesia. Inadvertent hypothermia has been taken into account as common side effect in the postoperative period immediately and it is related to wide impairments and anomalies of different body organs. Concentration on predictive factors of hypothermia would be important to reduce the incidence rate and correct preventable unnecessary risks for patients in the health settings following surgical operations. The aim of study is to assess the magnitude and associated factors of postoperative hypothermia recovery room in patients underwent general anesthesia. **Methods:** A hospital-based prospective cross-sectional study was conducted on200patients with different age groups of both genders who underwent a scheduled non-cardiac surgery and general anesthesia consecutively during the period between the October 1st and the November1st2016. **Results:** The study revealed that the overall core hypothermia in the study sample was31%. The study showed that the post-operative temperatures decreased statistically significantly in all study patients and separately in adults, children, males, or females P<0.001. The study also revealed that the operation duration(p=0.045)and pre-operative temperature P<0.001were predictors of post-operative hypothermia in study sample. **Conclusions:** The incidence of hypothermia among study sample was not so high. A significant reduction in core body temperature of patients between pre and post-operation times was found. Those patients with longer operation duration, lower room temperature, and lower pre-operative temperature were at more risk of post-operative hypothermia.

***Keywords:*** *core temperature, hypothermia, anesthesia, post-operation.*

## Introduction

The sensation of patients to cold, shake occurrence and shivering are events that are commonly developed following general anesthesia administration postoperatively. Hypothermia has been considered as the most frequent outcome of surgery underwent by anesthesia. A highly evolved characteristics of mammals and birds are called homothermous assist body in regulating and maintaining the internal body temperature close to constant and largely independent on the surrounding environment temperature The patients undergo regional or general anesthetic inducing changes in regulation of body health mechanisms together with exposure to cold in the operating room or environment of dental surgery take part in hypothermia [1].Normothermia or normal body temperature is defined when the core body temperature has the range36.5-37.5±0.5$^0$C. Hypothermia is defined as any core body temperature below1C in "Homothermous". Therefore, a core body temperature less than36$^0$Cis considered as hypothermia [2].The temperature range 32$^0$C-36$^0$C is considered as mild ,28-32$^0$C as moderate, and below28$^0$C as severe hypothermia [3,4].Some impairments resulted from hypothermia are reduction in the release of oxygen to the tissues [5], myocardial contractility, peripheral vasoconstriction [6], mismatch of ventilation-perfusion, blood viscosity increase, and left shift in the

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curve of oxyhemoglobin-dissociation [7] Moreover, the hypothermia is responsible for reduction in the function of platelets [8] and decrease in coagulation cascade activation [9] Concentration on predictive factors of hypothermia would be important to reduce the incidence rate and correct preventable unnecessary risks to patients in health settings following surgical operations. Therefore, the normal body temperature will be helpful in the reduction of hospital stay, infection of surgical site, blood transfusions postoperatively, pressure ulcers, disconformity and mortality [2]. The aim of this study is to assess the magnitude and associated factors of postoperative hypothermia at recovery room in patients underwent general anesthesia in Azadi Teaching Hospital.

## Material and Method

Cross-sectional study was conducted in Azadi Teaching Hospital and included 200 patients with different ages groups of both gender who underwent a scheduled non-cardiac surgery and general anesthesia consecutively, a pre-designed questionnaire included name, sex, age, ASA physical status, operation duration, operation room temperature, pre-operative core temperature, post-operative core temperature, and administered intravenous fluids amount in the time of anesthesia. The physical examination was conducted for all patients in order to exclude those patients with fever, sepsis, and ear infection, patients with thermos-regulation abnormalities, and those with hypothyroidism or hyperthyroidism history from the study. In addition, the patients were treated under local anesthesia were not included in the study as well. The core temperature (Tc) of each patient was measured using infrared tympanic membrane thermometer (ThermosScan® Type 6014 Pro 3000 Welch Allyn Medical Products). the tympanic membrane and hypothalamus have the same arterial blood supply arising from the carotid artery, so the membrane directly reflects core temperature [10]. The measurement of tympanic membrane temperature was performed before surgery commencement and on the arrival of the patient at the recovery room. The ear pinna was softly pulled backwards and the thermometer was insulated into the external auditory meatus, turned and directed towards the patient eyes. According to the manufacturer's instructions, the probe of the thermometer remained inside the ear patient for 1 to 2 seconds in that position to hear a beep sound of the device. A second measurement of the tympanic temperature was performed after two minutes to avoid the temperature difference of the device and the researcher error measurement and their average considered as the result. The protocols of the manufacturer were strictly followed during the entire study period [11]. Statistical analysis done by SPSS 23, the independent t-tests, paired t-test, and ANOVA one-way were utilized for the association of continuous and nominal variables, respectively. Table 3.1. The American Society of Anesthesiologists classification of physical status[12]

| **ASA Classification** | **Definition** |
|---|---|
| ASA I | A normal healthy patient |
| ASA II | A patient with mild systemic disease |
| ASA III | A patient with severe systemic disease |
| ASA IV | A patient with severe systemic disease that is a constant threat to life |
| ASA V | A moribund patient who is not expected to survive without the operation |
| ASA VI | A declared brain-dead patient whose organs are being removed for donor purposes |

## Results

The results obtained from the present study showed that the mean age of study sample was 29.86 ± 16.77 year. The percentages of the males and females were so comparable, 49.5% and 50.5%, respectively. More than two-third of the patients (75.5%) were aged 18 years or older and the remaining ones (24.5%) were less than 18 years old, as shown in table 1. The majority of the patients were located in ASA I (66.5%) and ASA II (25.0%). The mean of the operation duration was 50.32 ± 26.83 minutes. The mean of the IV fluid injected into the patients with various operation types was 881.80 ± 526.91 mL. In addition, the mean of pre and post-operation temperatures in the patients under study were 36.61 ± 0.45 $^0$C and 36.14 ± 0.49 $^0$C, respectively.

**Table 1: Baseline charactersictis of study patients**

| **Patients' Characteristics (n=200)** | **Frequency Distribution** | |
|---|---|---|
| | **F** | % |
| Gender | | |
| Male | 99 | 49.5 |
| Female | 101 | 50.5 |
| Age Categories | | |
| Adults (=>18 years old) | 151 | 75.5 |
| Children (<18 years old) | 49 | 24.5 |
| ASA physical status | | |
| I | 133 | 66.5 |
| II | 50 | 25.0 |
| III | 15 | 7.5 |
| IV | 2 | 1.0 |
| Operation Duration, min | 50.32 | 26.83 |
| IV Fluid (mL) | 881.80 | 526.91 |
| Pre-Operation Temperature0C | 36.61 | 0.45 |
| Post-Operation Temperature0C | 36.14 | 0.49 |

The incidence of post-operation core hypothermia was shown in table 2. The study revealed that the overall core hypothermia in the study sample was 31.0% (mild hypothermia-62 patients). This hypothermia was higher in males (34.3%), adult patients (42.9%), and those with duration of less than 2 hours (31.6%).

**Table 2: Incidence of hypothermia in study patients**

| **Patients' Categories** | **Frequency (F)** | **Percentage (%)** |
|---|---|---|
| Overall Hypothermia | | |
| temperature <360C (mild) | 62 | 31 |
| temperature =>360C | 138 | 69 |
| Gender | | |
| Male | | |
| Hypothermia | 34 | 34.3 |
| Normothermia | 65 | 65.7 |
| Female | 28 | 27.7 |
| Hypothermia | 73 | 72.3 |
| Normothermia | | |

***Cont...*** **Table 2: Incidence of hypothermia in study patients**

| | | |
|---|---|---|
| Age Categories<br>Adults (=>18 year)<br>Hypothermia<br>Normothermia<br>Pediatric (<18 year)<br>Hypothermia<br>Normothermia | <br><br>41<br>110<br>21<br>28 | <br><br>42.9<br>57.1<br>27.2<br>72.8 |
| Operation Duration<br>< 2 hours (196 patients)<br>Hypothermia<br>Normothermia<br>=>2 hours (4 patients)<br>Hypothermia<br>Normothermia | <br><br>62<br>134<br>0<br>4 | <br><br>31.6<br>68.4<br>0.0<br>100 |

The core temperatures measured throughout the study duration in pre-operation and post-operation were compared by means of the statistical analyses as shown in table 3. The study showed that the post-operative temperatures have been decreased, statistically significantly in all the patients under study and separately in adults, children, males, or females (P<0.00001).

**Table 3: Comparison of pre and post-operation temperatures in study patients**

| **Categories** | **Pre-operation Temperature 0C<br>Mean ± S.D. & Range** | **Post-operation Temperature 0C<br>Mean ± S.D. & Range** | **p-value (two-sided)** |
|---|---|---|---|
| All patients (n=200) | 36.61 ± 0.45<br>34.30-37.60 | 36.14 ± 0.49<br>34.30-37.20 | P≤0.001 |
| Adult Patients (n=151) | 36.66 ± 0.41<br>35.20-37.60 | 36.19 ± 0.45<br>35.10-37.20 | P≤0.001 |
| Children (n=49) | 36.47 ± 0.53<br>34.30-37.40 | 36.01 ± 0.59<br>34.30-36.90 | P≤0.001 |
| Male Patients (n=99) | 36.59 ± 0.50<br>34.30-37.60 | 36.10 ± 0.52<br>34.30-37.10 | P≤0.001 |
| Female Patients (n=101) | 36.63 ± 0.40<br>35.40-37.30 | 36.18 ± 0.46<br>34.70-37.20 | P≤0.001 |
| Paired t-test was performed for statistical analysis. | | | |

The post-operative core temperatures were compared between adults and children, in addition, between males and females and in order to understand to what extent the temperature has been reduced as compared to each other. The study showed a non-significant differences in the post-operative temperatures between adults and children (p=0.059) between males and females (p=0.256) and also between different ASA groups. Table 4.

**Table 4: Comparison of post-operation temperatures between adult and pediatric samples of the study**

| **Post-operation Temperature (Adults)** | | **Post-operation Temperature (Children)** | | **p-value (two-sided)** |
|---|---|---|---|---|
| 36.19 ± 0.45 | | 36.01 ± 0.59 | | P> 0.05 |
| Post-operation Temperature (Males) | | Post-operation Temperature (Females) | | p-value (two-sided) |
| 36.10 ± 0.52 | | 36.18 ± 0.46 | | P> 0.05 |
| ASA I<br>36.10 (n=133) | ASA II<br>36.24 (n=50) | ASA III<br>36.16 (n=15) | ASA IV<br>36.20 (n=2) | P>0.05 |
| *independent t-test and ** ANOVA one-way were performed for statistical analysis. | | | | |

Table5 shows significant positive correlation between the age and post-operative temperature (r=0.160, p=0.024). However, there was statistically not significant correlation between operation duration and post-operative temperature (r=0.56, p=0.424).

**Table 5: Person's correlation of post-operation temperature with patients' age and operation duration (n=200)**

| **Characteristics** | **Post-Operative Temperature** | **p-value (two-sided)** |
|---|---|---|
| Patients' Age | r=0.160 | P ≤ 0.05 |
| Operation Duration* | r=0.056 | P> 0.05 |
| *the number of patients underwent surgery for <120 min were 96) and for =>120 min were 4. | | |

Among study patients who underwent the operation, an univariate analysis was performed for the post-operation temperature as the dependent variables as shown in table 6. . The study revealed that the operation duration (p=0.045), and the pre-operative temperature (p=0.001) were predictors of hypothermia in our study sample.

**Table 6: Univariate analysis of post-operation predictors in study patients underwent general anesthesia (Dependent Variable: Post Operation Temperature)**

| **Characteristics** | **Degree of Freeedom (df)** | **F** | **p-value (two-sided)** |
|---|---|---|---|
| Age | 56 | 0.932 | P> 0.05 |
| Sex | 1 | 0.732 | P> 0.05 |
| ASA | 3 | 0.639 | P> 0.05 |
| Operation Duration | 21 | 1.698 | P = 0.045* |
| Pre-Operation Temperature | 22 | 8.591 | P ≤ 0.001* |
| *statistically significant level | | | |

## Discussion

The incidence of inadvertent post-operative hypothermia among a Kurdish sample in Iraq was 31.0% with mild severity only also showed a significant reduction in the overall post-operative core temperature, with both genders, and different age categories so lower compared to other studies reported 57.8% hypothermia in 185 adult patients underwent scheduled emergency non-cardiac surgery in ICU admission [13], 44.8% hypothermia in operations of more than two hours [14] and 32% in another study [15], study showed that male patients were more affected by hypothermia (34.3%) compared to females (27.7%) and adults (42.9%) compared to pediatric patients (27.2%). However, the overall differences of hypothermia between males and females (p=0.059) and between adult and pediatric patients (p=0.256) were not statistically significant. This reflects this reality that every person could be at risk of hypothermia. Although the elderly and very younger patients are more at risk of hypothermia [16].

they reported that those with major-plus surgery, longer operation duration and>2 h, intravenous unarmed fluid infusion (>1000 ml) significantly are at risk of core hypothermia similar to study reported that those patients with elevated baseline core temperature prior to anesthesia) and high ambient temperature) are significantly lower at risk of core hypothermia[15], we found there is a positive correlation between the operation duration and post-operative core temperature (r=0.056), but not significantly (p=0.429), possibly due to insufficient sub-sample size as those =>120 min operation duration were only 4 patients which is in agreement with another study [17] the patients with higher ASA physical status were more at risk of hypothermia [2]. In our study we could not find any significant correlation between post-operative hypothermia and different ASA physical status (p=0.404). This may be attributed to small sample size in those with ASA III and ASA IV. According to the guidelines of the National Institute of Health and Clinical Excellence (NICE), it is necessary that in high-risk surgeries, perioperative temperature must be followed rigorously when the oral temperature is below 36ºC. Such patients must be warmed for 20 minutes before surgery commencement with convenient techniques [18]and [19] respectively.

**Conclusions:** The incidence of hypothermia in our study sample was not so high (31.0%) defined as =<36 $^0$C.. A significant reduction in core body temperature of patients between pre and post-operation times was found (P<0.00001). Those patients with longer operation duration, lower room temperature, and lower pre-operative temperature were more at risk of hypothermia.

### Ethical Clearance

The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq; **Also** The ethical approval of the research was obtained from the local Health of the Ethics Committee of the General Directorate of Health in Duhok and Scientific Committee of College of Medicine-University of Duhok.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# Histological and Biometric Study of the Effects of *Fusarium Graminarum* Silver Nanoparticles on the Kidney in Male Albino Mice

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## Abstract

An approach to synthesizing silver nanoparticles(AgNPs)using a Fusarium graminarum fungus was established in the present study.These nanoparticles are identified with the following techniques to confirm the form, size, and other physical properties of the crystal:UV-Visible Spectroscopy(UV-Vis),where the AgNPs showed absorbance at 420 nm, while X-Ray Diffraction (XRD)showed diffraction peaks at(38.05°,4 nm).The experiment consisted of 40 mice divided into two groups, the first group of 20 mice was considered to be the control animals and the other group 20mice was 21day of treatment with a dose of AgNPs(0.1ml/ day).Microscopic examination of the kidney section showed lobulated glomeruli,a large area of hemorrhage, changes in degeneration, and inflammatory cell infiltration. Biometric changes of the renal corpuscle showed no significant difference between the study group,while Bowman's capsule,Proximal,and distal convoluted tubules revealed increased significant differences between the two groups.

***Keywords:****Fusarium graminarum, toxicity,AgNPs, kidney,Image J*

## Introduction

Nanoparticles are defined as very small individual minutes whose dimensions are between 1- 100 nanometers[1], and because of their small size compared to some materials that are more than 100 nanometers in diameter and with a large surface area in relation to their size, different degrees of biological effects, chemical reactions, and highly distinctive properties are not found in the materials.The other, because of its small size, can easily enter the cells of living things[2]. Several previously published studies reported that liver and kidneys were target sites for silver deposition[3],after the entry of silver nanoparticles(AgNPs)into human or animal bodies via several ways including inhalation, ingestion, and the skin[4]. Also, other studies documented that nanosilver had the capacity to induce toxicity and inflammatory response in these tissues[5,6].

The use of eukaryotic organisms such as Fusarium graminarum and other species has attracted considerable potential for producing large-scale metal nanoparticles because the enzymes that are secreted by the fungi are an essential component for the biosynthesis of metal AgNPs due to their excellent properties and specific characteristics.As well as its therapeutic potential for treating a variety of diseases including acquired immunodeficiency syndrome and retinal neovascularization[7].

The aim of the study is to know the effects of AgNPs from the *Fusarium* fungi in the kidney of mice in addition to studying their nanoparticles due to the lack of studies around them.

## Materials and Method

### *Fusarium graminarum* isolation

Isolated from the decayed banana fruit,*Fusarium graminarum* has been maintained by serial cultivation on potato dextrose agar medium,incubated at 28°Cfor 4-5 days,potato dextrose agar was prepared that according to the manufacturer's instructions,39gm Potato dextrose agar should be dissolved in 1000ml distilled water.Sterilized by autoclaving at a pressure of 15 lbs and temperature of 121°C for 15 minutes.It was

cooled to 45-50°C, and subsequently added antibiotic chloramphenicol(250mg/liter)to the sterile Petri dishes.Isolates of *Fusarium graminarum* is cultivated. The potato dextrose broth medium was performed by suspending 24 grams of distilled water in 1000 millilitres. Heat up full to remove the medium.Sterilize at a pressure of 15 lbs and temperature 121°C in 15 min by autoclaving.It was cooled down then added antibiotic chloramphenicol(250mg/liter).This broth was used in the extracellular synthesis of AgNPs for cultivating *Fusarium graminarum*.

**Preparing *Fusarium graminarum* AgNPs**

The 250 ml of *Fusarium graminarum* mycelia was placed in a beaker containing 100 ml of PDB medium and then incubated for 5 days at a temperature of 25±2°C. The mycelia were collected and purification with filter paper(No.42)to get rid of any remaining parts of the mycelia and then re-suspended the mycelia in 100 ml of distilled water incubated at 25°C for 24 hours.After filtering, the mycelia cells were collected and divided into two parts:

- The first part was treated with a 1mM solution of silver nitrate(AgNO3)and incubated at room temperature, which changed color to brown and was considered a positive control.

- The second part without adding AgNO3 to the filter cells,the color has not changed and is considered a negative control.

The AgNO3 can be observed by changing the color of the fungal filtrate.The concentration, size, aggregation state and crystal morphology were measured using the following techniques:

1) Atomic absorption spectroscopy flame (AASF)

The AASFexamines the concentration of the elements in a liquid sample,depending on the energy absorbed from confident light wavelengths.The silver ion concentration identified in the colloidal solution was 2.5µg/ml,where this concentration was considered stock.

2) UV–Visible spectroscopy

Ultraviolet visible spectroscopy(UV-VIS)used to investigate the characteristics of nanomaterials involving aggregation state,concentration,size,and even bio-conjugation when the absorption shapes of nanomaterials are distinguished by passing light through a sample and measuring light transmission through a sample.One milliliter of AgNPs was examined on the spectrophotometer system in the chemistry department of the College of Science at Mustansiriyah University[8].

3) X-Ray diffraction (XRD)

X-ray diffraction is an analytical technique primarily used for determining the crystallite size of AgNPs in solution[9].

4) Atomic force microscopy (AFM)

The AFM characterized biosynthesized nanoparticles.On a glass slide a tinny film of the sample was set by dipping 100µl of the sample on the slide,allow to dry for 5 minutes.The slides were scanned with microscopy by Atomic Force[10].

**Experimental animals**

The study was conducted using 40 male albino mice obtained from the Iraqi Center for Cancer Research and Medical Genetics Mustansiriyah University and their ages ranged between 8-12 weeks and a weight of 20-28 gm.During the experiment, the animals were placed under laboratory conditions of aeration, lighting, and heat.The animals were divided into two groups: the first included 20 mice as a control group, and the second included 20 mice,dosed with 0.1 ml/day for 21 days in *Fusarium* AgNPs at a concentration of 2.5 µg/ml.

**Histological and Biometrical study**

The tissue sections were prepared according to Suvaran *et al*.[11].Kidney samples were fixed with formalin (10%).After, samples were processed, embedded in paraffin waxed, cut into 5µm thick, and stained with hematoxylin-eosin stain.

Barometric measurements were performed to measure the diameters of the renal corpuscle, Bowman's capsule space and proximal and distal convoluted tubules using an Image J program (Sun microsystems,Inc.USA).

## Statistical Analysis

The statistical analysis was carried out with the software SPSS version 25.0(SPSS Inc.,Chicago,

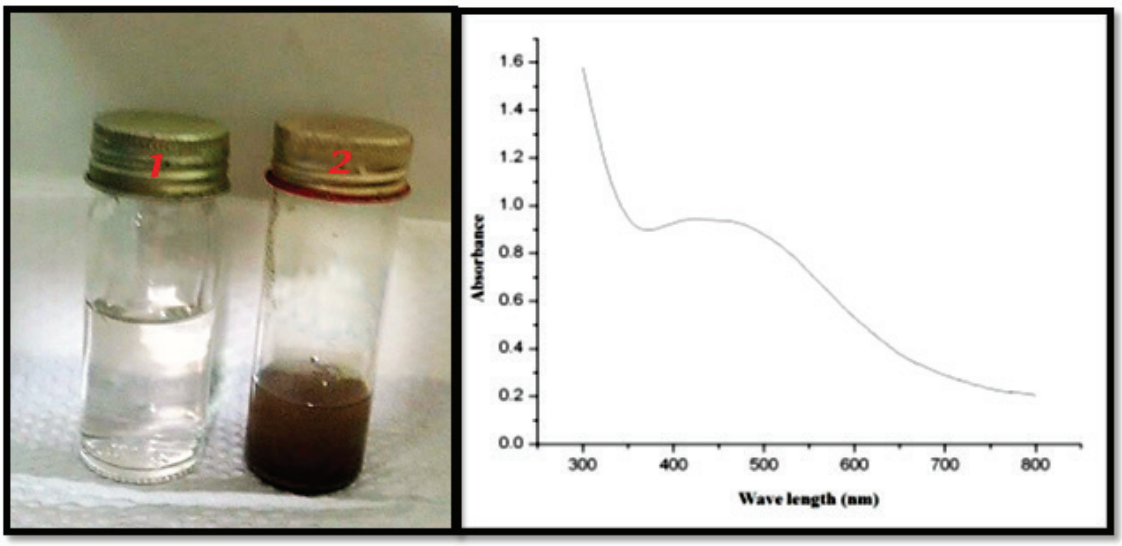
IL,USA).The data were expressed as mean±standard error(SEM).The means analysis was performed by t-test of independent-samples.A statistically significant value of P≤0.05 was found.

## Results and Discussion

### Detection of *Fusarium* AgNPs and UV–Visible spectroscopy

The synthesis of AgNPs by using *Fusarium graminarum* was showed after adding AgNO3 to the filtered cell.The color of the mixture changed from colorless to dark -brown compared with negative control remain colorless,fig.(1a)illustrated the changes in color which indicated the presence of *Fusarium graminarum* AgNPs.These results corresponding with[12],reported the appearance of brown was a clear indicator of the synthesis of AgNPs in the reaction combination.

On the other hand,*Fusarium* AgNPs properties by UV-Visible spectroscopy technique confirms the presence of Fusarium AgNPs by measuring the absorbance of the bio-reduced solution at wavelengths between 300 and 800 nm.Extinction spectrophotometer of UV and visible Vis light (UV-Vis spectrum)confirmation of the presence of Fusarium AgNPs is permitted because of a distinctive Plasmon resonance,which showed a peak absorption at 420 nm, fig.(1b).



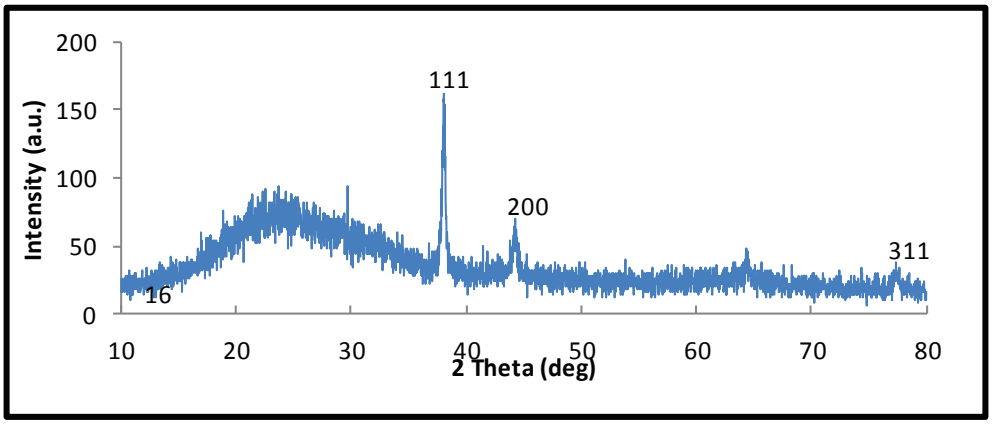

**Figure(1):(a)Synthesis of AgNPs:(1)negative control observed colorless,(2)synthesized *Fusarium graminarum* AgNPs showed brown color.(b)UV-Visible spectroscopy of *Fusarium* AgNPs**

The results corroborate those of previous studies such as Birla *et al*.[13]who showed that the absorption peak is about 420 nm,which is specific to AgNPs. There was one peak refers to the synthesis of spherical nanoparticles, and it is known that there is a very close relationship between the absorption spectra of UV-Vis and the size and shape of AgNPs.Also,Singh *et al*.[14] reported that the production of AgNPs by using endophyte fungus *Fusarium spp*.with maximum surface Plasmon resonance peak at 420 nm.Ingle *et al*.[15] reported that the UV spectrum is allowed to confirm the existence of metal nanoparticles due to distinctive Plasmon resonance.

Fusarium graminarum AgNPs characterized by XRD

The XRD pattern of *Fusarium* AgNPs as revealed in fig.(2),the diffraction peaks at 38.05°, 44.22°,64.32 and77.31°were correspondent to the(111,200,220,311) the faces of the face-centered crystal cube structure,therefore the average crystallite size was 28.225nm.

The results correspond to the results of Shafiq *et al*.[16]who revealed that the XRD diffraction measured in AgNPs resulted in four intense peaks and this further confirms that AgNPs made in extracellular filtration is present in the form of AgNPs.Also,Mahmoud *et al*.[12]reported four distinct diffraction peaks at angles 38.15°,44.18°,64.63°, and 77.50°correspond to(111,200,220 and 311)planes of the face-centered cubic.This further asserts that the AgNPs formed in extracellular filtration is present in the form of AgNPs. Also,similar results have been reported by Gholami *et al*.[17]when extracted nanoparticles from *Fusarium oxysporum*.

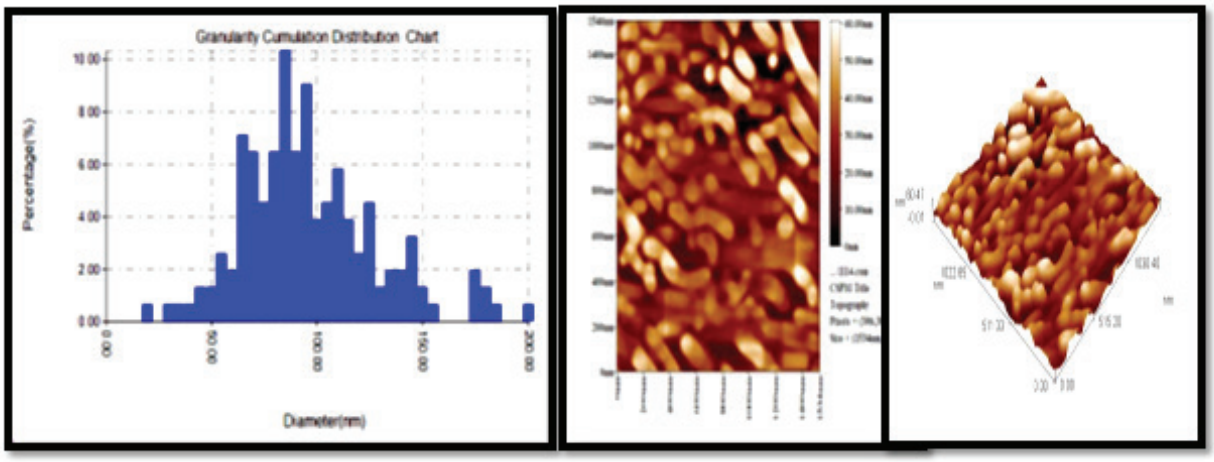



**Figure(2):X-Ray pattern of Fusarium AgNPs**

***Fusarium graminarum* AgNPs characterized byAFM**

Determine of *Fusarium* AgNPs surface morphology and sizes were measured, using the AFM. The images of AFM for *Fusarium* AgNPs in figure(3a)represented particle size distribution, where the average diameter is 94 nm.

While in fig.(3 b, c)showed AFM picture in two dimensions(2D)and three dimensions(3D),it explains structural shape for grains, found that the average roughness is 9.33 nm and Root mean square is 11.6 nm.The AFM is a very good technique for measuring surface morphology and fine structure of nanoparticles[18].The AFM topology is very helpful in revealing the exact size and shape of AgNPs[19].




**Figure(3):(a)Granularity volume distribution of *Fusarium* AgNPs.(b)AFM images of *Fusarium* AgNPs with two dimensions 2D,(c)three dimensions 3D.**

**Histological study of kidney**

Sample of control of kidney tissue demonstrated a normal histological structure of the convoluted tubules and renal corpuscles fig.(4a).In treated mice with *Fusarium* AgNPs after 21 day showed dilation in the collecting tubule fig.(4b),while, dilation in the renal corpuscle with hemorrhage in the interstitial space between the tubules fig.(4c).Also,hydropic degeneration in epithelium cells of the renal tubules with hemorrhage in the interstitial space between the renal tubules fig. (4d).

**Figure(4):Cross section of the *Fusarium* AgNPs effects after 21 day in kidney of mice detected by H&E staining:A.**control group shows normal appearance of the convoluted tubules (black arrows) renal corpuscles (yellow arrows)(X4).**B:**dilation in the collecting tubule(red arrows)(X10),**C:**dilation in the renal corpuscle(yellow arrow)hemorrhage in the interstitial space between the tubules(black arrow) (X10),**D:**hydropic degeneration in epithelium cells of the renal tubules(yellow arrow)(X40).

In the current study,the kidney tissue showed a clear effect, represented by degenerative changes in the epithelial cells lining the renal tubules when treated with *Fusarium* AgNPs after 21day.This may be due to the accumulation of AgNPs in the renal tubules, which may have led to a change in the permeability of the cell wall due to its effect on the entry and exit of ions into the cells of the renal tubules[20,21].Also, may be that most of the AgNPs is caused the renal artery damage which indicates to the detoxifying organ[22]. The toxicity of silver ions has led in a number of studies that release of silver ions (Ag+) from AgNPs could be responsible for toxic responses seen in exposures to AgNPs[23].Although there are not a mechanism of action for toxic histological changes after AgNPs treatment; but previous study hypotheses that silver nanoparticles can disrupts the,Cl- ,H+ and Na+ exchanges at the cell membrane[24].Other researcher proposed that exposure to AgNPs involved genes in inflammation and dissolved Ag implicate oxidative stress,study by Vasanth and Kurian[25]reported collected evidence suggests that the kidney is one of the major organs with reported adverse effects of nanoparticles and the accumulation of NPs in the kidney,leading to nephric inflammation, dysfunction and cell necrosis.Another research by Ma *et al*.[26]found that the AgNPs disrupt the energy metabolism and cause mitochondria and cell membrane damage in the rat kidney,which can lead to nephrotoxicity caused by AgNPs.

**Biometric study of kidney**

Table(1)shows the results of Renal corpuscle,Bowman's capsule,Proximal convoluted tubules, and Distal convoluted tubules diameter respectively in the control group compared with the *Fusarium* AgNPs group.Non-significant different($P<0.05$)is found in Renal corpuscle diameter of *Fusarium* AgNPs group(68.54±1.39µm)compared to that of the control group(70.45±0.66 µm).

Statistically increased significant difference is found in Bowman's capsule diameter between *Fusarium* AgNPs group(15.96±0.34 µm)as compared with the control group (8.04±0.13µm).The expansion of Bowman's capsule may be due to the contraction of the glomeruli of the renal glomeruli or to the destruction of the Bowman's visceral layer[27].Roda *et al*.[28]were evaluated to examine renal responses 28 days after a low AgNPs dose,the AgNPs caused dilatation of the intercapillary and peripheral Bowman's space was showed, as well as with glomerular shrinkage.

On the other hand, increased significant difference is found in Proximal and distal convoluted tubules diameter between *Fusarium* AgNPs group(41.38±0.26,41.66±0.42µm) as compared with the control group(37.82±0.60,37.22±0.33µm)respectively. The appearance of glomerular atrophy and disruption in renal tubules is consistent with Sardari *et al*.[29]which pointed when exposed to AgNPs showed damages in the epithelial lining of renal tubules leading to increased glomerular pressure.Furthermore, study of Meyer[30] revealed that glomerular atrophy might occur to decreased the filtration process in response to damaged tubules,which caused by heavy metals. Another study by Tiwari *et al*.[31]point out that exposed to AgNPs could be affected due to damaged brush border of epithelial lining of Proximal convoluted tubules.

**Table(1): Biomatric changes of renal corpuscle, Bowman's capsule, Proximal and distal convoluted tubules**

| Diameter / µm | Control group n=20 | Fusarium AgNPs group n=20 | P-Value |
|---|---|---|---|
| Renal corpuscle | 70.45±0.66 | 68.54±1.39 | 0.24(NS) |
| Bowman's capsule | 8.04±0.13 | 15.96±0.34* | 0.00 |
| Proximal convoluted tubules | 37.82±0.60 | 41.38±0.26* | 0.00 |
| Distal convoluted tubules | 37.22±0.33 | 41.66±0.42* | 0.00 |
| *signification differences between group(p< 0.05).NS:no signification | | | |

## Conclusion

Our study concluded that because of its ability to enter and translocate within the cell, the size of the AgNPs varies with its toxics effects on the cell and the cell organelles.Therefore,it could be assumed that all nanoparticles are toxic and most likely only free nanoparticles that can penetrate small organelles like mitochondria may trigger adverse health effects. Hence,the AgNPs *Fusarium*.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding**: Self-funding

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# Assessment Hormonal Disorders of Women in Oral and Vaginal Changes

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## Abstract

Hormonal deficiencies may contribute to the development of abnormalities of oral and vaginal tissues, such as pain, desquamation, recurrent oral, vaginal ulceration and delayed post-surgical healing .This study was done to determine the differences of cell activity in oral and vaginal mucosa .

A total of 200 females of different age groups were used in this study Oral smears were obtained from the buccal mucosa by scraping the area gently using a wooden tongue depressor while vaginal smears were obtained from the proximal portion of the lateral wall of the vagina using Ayre's spatula by scraping the area gently . In order to find to change in mucosa during different phases of menstrual cycle .

In two groups the present results revealed that vaginal cytological patterns of each group is similar to the oral cytological pattern with some differences .

In conclusion significant correlation between the hormonal fluctuations in woman and the degree of maturation of their oral epithelium was revealed in this study .

***Keywords:*** *Oral discomfort; Vaginal discomfort, clinical aspects; vaginal cytological ; toxicity.*

## Introduction

The oral mucosa member itself is composed of two layers the Lamina propria and the surface epithelium . Abasement membrane separates the Lamine propria from the stratified squamous epithelium [1] while the genital tract in women consists of vagina, uterus, fallopian tubes and ovaries, the vagina is a fibro muscular tube consisting of inner mucosa and other muscular layer which leads from the uterus to the Vulua [2,3] .

The periodic and cyclical shedding of progestasional endometrium accompanied by loss of blood . It occurs approximately 28 days intervals period of cycle normally range from twenty-five to thirty-five days [4,5,6].

Cyclical changes involve the hypothalamus, the pituitary gland, the ovaries, the endometrium and the secondary sex organs [6] .

The oestrogen secreted by the granulosa and cells of the ovarian follicles and subsequently by the same cell from the corpus luteum [6,7] .

The progesterone is an endogenous steroid and sex hormone involved in menstrual cycle – it belongs to a group of steroid hormones [8,9] .

## Material and Method

The correction of samples started from January to December 2019 from 200 women non-pregnant not take contraceptive pills, with regular menstrual cycle the age range between 18-30 years old .

Oral smears were obtained from the buccal mucosa by scraping the area gently using a woodern tongue depressor. While vaginal smears were obtained from the proximal protion of the lateral wall of the vagina using Ayre's spatula by scraping the area gently .

Women are divided into two-group .

**Group I:** Females having a normal and regular menstrual cycle from samples were collected the time period from day 10-18 this time period revealing a predominance of oestrogen influence . Total No. of this group (100) .

**Group II:** Females having a normal and regular menstrual cycle from whom samples were collected on any day during the time period revealing a minimal oestrogen influence and predominant progesterone effect .Total No. of this group (100) .

Each subject required to complete aquestionauire which established name, age, occupation, address, smoking habits, day of menstrual cycle, present medical history, past medical history and hormone therapy .

Then all smears were prepared promptly and fixed immediately because exfoliated cells degenerate rapidly . smears are fixed in 95% ethylalcohol and them stained heamotoxyline and easine method .

Then prepared smears were screened and evaluated for female hormonal effect the karyopyknotic index K.P.I was used for evaluation of oestrogen hormone effect while crowded index Cr.I for progesterone hormone effect .

## Statistical Analysis

The result were presented as mean ± S.D (Standard deviation) for all group .

The result were analyzed by using students t-test and correlation coefficient test with $P < 0.005$ as the limit of significance.

**Table (1) : Age (mean, range) and standard deviations of women groups .**

| Group | Total | Age (years) Mean + S.D | Range |
|---|---|---|---|
| I | 100 | 27.02 + 6.12 | 18 – 30 |
| II | 100 | 24.23 + 6.82 | 18 – 30 |

**Table (2) : Mean and standard deviations of K.P.I and Cr.I. of both oral and vaginal smears of each group of women .**

| Group | V.K.P.I. | O.K.P.I. | V.Cr.I. | O.Cr.I. |
|---|---|---|---|---|
| I | 72.12+10.24 | 61.73+12.02 | 57.21+10.12 | 51.24+10.01 |
| II | 45.21+10.44 | 41.91+10.10 | 78.35+28.72 | 67.32+27.01 |

**Table (3) : The coefficient correlation factors (r), t and probabilities for two group of women .**

| Group I (n=100) | | Group I (n=100) |
|---|---|---|
| V.K.P.I. | r = 0.92 | r = 0.82 |
| | t = 13.82 | t = 19.27 |
| O.K.P.I. | P < 0.001 | P < 0.001 |
| V.Cr.I. | r = 0.92 | r = 0.98 |
| | t = 16.24 | t = 77.28 |
| O.Cr.I. | P < 0.001 | P < 0.001 |

## Result

Oral and vaginal smears were studied on 200 women with normal and regular menstrual cycle, The use of oral and vaginal smears for the assessment of sex hormone activity is a very convent method which offers contain advantages over other techniques . It is cheap, doesn't hurt the patient .

The mean age and standard deviation for each group in shown in table(1).

The mean K.P.I. and Cr.I. of both oral and vaginal smears with their standard deviation for each group is shown in table (2) . The coefficient correlation factors (r), student's t-test and probabilities (p) for each group is show in table (3) .

The vaginal and oral smears presented contain difference .

1) Non based cells found in mouth smears .

2) Most of intermediate oral cells showed purple or deeply stained granules in their cytoplasm .

3) The similar between mouth cells with nuclei and the vaginal smears with nuclei common pykontic .

4) In vaginal smears the white blood cells more and rarely found in the oral smears .

## Discussion

The research for comparing epithelium smears in oral and vaginal at different hormonal changes such as in variant phases of menstrual cycle .

It found the vaginal smears are important in study same change in oral smears which posses contain feature similar with vaginal [10] .

The study of effects oestrogenic and gonadotrophic hormones in females for treatment a menorrhea or other defects . If oestrogenic injected into castrated females the microscopic finding changes in keratin formation [10,11].

The cycle changes of oral mucusa during the course of a normal menstrual cycle of healthy women have been examine by different authors in the last few decades .

The alteration in cells of the oral cavity conciding with changes found in the vaginal smears thus reflecting the hormonal state of the menstrual cycle [10] .

The present study revealed that the oral smears which prepared from women during a predominance of oestrogen presented an increased number of superficial epithelial cells with pyknotic nuclei . The oral smears which prepared from women during a lower amount of oestrogen and a predominance of progesteron presented the presence of an increased number of intermediate epithelial cells, with a significant decrease in the number of superficial cells with pyknotic nuclei, therefore there is typical hormonal changes in buccal smears of the young women that corresponded with the stages of their menstrual cycle .

## Conclusion

In conclusion significant correlation between the hormonal fluctuations in woman and the degree of maturation of their oral epithelium was revealed in this study . The mouth and vaginal epithelium show parallel variants in degree of maturation of this study during menstrual cycle .

The oral smears despite it's technical advantage can not replace the vaginal smears .

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest**: Non

**Funding**: Self-funding

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# A Difficulty Chart for Estimation of Treatment Duration of Palatally Impacted Canines

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## Abstract

Treatment of maxillary impacted canine is a challenging process to dental specialists and orthodontists. The aim of the present study was to assess the duration of orthodontic treatment of palatally impacted canines, using a difficulty chart as an estimate of the prognosis, and relating it to the treatment time and to other factors that might affect the treatment duration. A cross-sectional study was undertaken using a self-administered questionnaire to be completed by orthodontists (82 participants). An index was used as a tool to assess the prognosis and treatment duration. The study found that 48.7% of active orthodontic treatment time for palatally impacted canines was completed in 1.5 to 2 years. The number of active treatment visits per patient was between 16 and 22 (62% of treatment visits). In terms of the treatment performed, 81.7% of cases had space created prior to surgical exposure, and 59.8% had open surgical exposure. Failed to attend visits by the patient accounted for 48.4% and 62.2% did not require repeated surgical exposure. Interestingly, 85% of the cases had 'good' or 'average' prognosis (49% and 36%, respectively). A prognostic chart can provide an estimate for the treatment time to bring a palatally impacted canine into the arch. This information might be valuable for both orthodontists and their patients, to estimate the time of the planned treatment and provide a valid consent form.

***Keywords:*** *Palatally impacted canine; Treatment time; Difficulty chart, Surgical exposure.*

## Intoduction

The maxillary canine plays a major role in the aesthetic and functional aspects of the occlusion and its absence should be avoided wherever possible. [1] This tooth is considered as the most frequently affected tooth with eruption problems, following the third molar, with a reported prevalence of 0.92% to 6.04%. [2,3] Data from previous studies suggests that, 85% of canine impactions occur palatally and 15% buccally, moreover 8% to 10% of canine impactions occur bilaterally. [4]

Several studies have linked canine impaction with multiple etiological factors such as anomalies and absence of lateral incisors, ectopic tooth germ position, the presence of mechanical obstruction, and genetic factors. [5] The treatment of palatally impacted canines is a common challenge faced by dental professionals in daily practice. Different types of treatment modalities have been suggested, including early interceptive or late management, that combines surgical–orthodontic methods. [6,7] Canine extraction and auto-transplantation have been suggested as an alternative way of management. [8,9] Special biomechanics and anchorage are always required during canine traction, such as large cantilever wires with adequate support for the adjacent teeth. [10,11]

The active orthodontic treatment time is defined in relation to either the bonding of a fixed orthodontic appliance or the final realignment of the impacted canine within the dental arch. Published data shows the overall treatment time ranging from 19.6 to 28.8 months, with large individual variations. [12] The number of orthodontic dental visits required to treat ectopic maxillary canines in past studies has varied from 17.7 to

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39.8 appointments. [12,13]

Any treatment of palatally impacted canine is considered complex. [14] This complexity depends on several factors including the location (palatal, buccal), the angle of impaction, and how close the canine is to the midline. [15] Other factors that might complicate and increase the treatment time include unfavourable impaction, the method of exposure and traction, whether space has been created pre-exposure, the age of the patient, and appointment numbers relating to active orthodontic treatment. [16] Several classifications have been advocated to quantify the severity of canine impaction and to estimate the prognosis, considering how complex the treatment of each case could be. [17,18] According to the Ericson and Kurl classification, an impaction close to the midline is considered complex and requires special biomechanics. [19] Similarly, a horizontally impacted canine (angle of impaction) is more challenging and may compromise the prognosis. [20] Information about orthodontic treatment time and prognosis needs to be given to patients when discussing treatment options in order to obtain valid informed consent.

To our knowledge, no previous study in Iraq has addressed the prognosis and the actual treatment time needed to bring the canine into the dental arch. This study sets out to assess the treatment difficulty and duration of palatally impacted canines, with the help of an index (chart) especially used to estimate the prognosis of treatment.

## Methods

This is a cross-sectional descriptive study designed with the aid of a self-administered questionnaire. The study was conducted in the College of Dentistry (Baghdad University) from April 2019 till October 2019. The study population included orthodontist specialists working at academic institutions, private clinics, and hospitals: all were invited to participate in the study. Overall, a total of 120 surveys were distributed, of which 38 were excluded as they were inappropriately filled in or incomplete; in the end, only 82 questionnaires were eligible for data analysis. The study was approved by a local committee in the Orthodontic Department at the College of Dentistry (Baghdad University).

This survey, in the form of a questionnaire, focused only on patients with palatally impacted canines (unilateral or bilateral) who had received treatment from the orthodontists. For example, one case was selected in which the canine was tracked to its ideal position in the arch using a fixed appliance; this case was chosen by the orthodontist to be one of the best cases that was treated, and the treatment was completed on time. It involved the selection of the prognostic factors and the canine position relating to the treated case, using the parameters from previous studies. [21,22] A chart recommended by the Royal College of Surgeons (RCS Eng) guidelines was given to the orthodontists to estimate treatment difficulty and prognosis [17], as shown in Figure 1. The prognosis considered 'good' was when all four categories were good, 'average' prognosis was considered when only two categories were 'good'. 'Poor' prognosis in all of the categories was considered to be 'poor'.

The questionnaire involved several questions in the form of closed questions, such as the active orthodontic treatment time was specified as the time from the bonding to the debonding of the fixed appliance, and the time needed to realign the canine to correct occlusion (from exposure time to the dental arch) to bring the canine in occlusion. Other details were recorded, including: the total number of active visits, the orthodontic anchorage devices used, the time taken for canine realignment from exposure to correct occlusion, the radiographic assessment, age and gender of the patient, whether the impaction was unilateral or bilateral, the method of exposure and mechanical traction, pre or post exposure space creation, number of failures, and emergency visits and failed to attend visits during the course of the orthodontic treatment (Table 1). The survey was piloted by ten orthodontists to assess the suitability of the questions which were reviewed and adjusted to ensure scientific accuracy. The data was analysed using Microsoft Excel starter 2010 (Microsoft Corporation).

## Results

Data from 82 orthodontists for 82 patients with palatally impacted canines were collected and analysed with a response rate of 68.3%. About two-thirds of the patients were females (65.9%), and the age range of the patients was 12 to 20 years (mean = 14 years old). Unilateral canine impaction accounted for 69.5% of the

cases.

The survey revealed that 49% of active orthodontic treatment for palatally impacted canines was completed in 1.5 to 2 years, with a mean of 21 months (Figure 2A). Sixty-eight percent of the patient's canine realignment (from exposure to the correct occlusion) was achieved in 15 months (range of 12 to 18 months). Sixty-two percent of active treatment visits made by the patients were between 16 to 22, with a mean of 19 visits (Figure 2B).

In 81.7% of the cases, space for the impacted canine was created prior to exposure, and in 59.8% open surgical exposure was performed (Figure 3A). The number of visits failed to attend by the patient during the treatment was 48.8% (less than four visits) (Figure 3B), and 62.2% of the patients did not require additional or repeated surgical exposure (Figure 3C).

Regarding the estimation of treatment difficulty, using the chart provided, four categories were included: incisor overlap, vertical height, and the angulation and position of the apex. The results revealed that 51.3% of cases had a 'good' prognosis, and 34.1% had an 'average' prognosis, while 14.6% of cases had a 'poor' prognosis (Figure 4).

| Age: Gender of patient: |
|---|
| Number of impacted canine<br>A- Unilateral B- Bilateral |
| The space for accommodating the tooth was created<br>A- Pre-exposure B-Post-exposure |
| The method of exposure was<br>A- Open B- Closed |
| Total Duration of active orthodontic treatment was<br>A- Up to 1 year, B- 1–1.5 year, C- 1.5–2 years, D- More than 2 |
| Canine realignment from exposure to correct occlusion<br>A- 6 months B- Less than 1 year C- 1–1.5 year D- More than 1.5 |
| Total number of active visits during orthodontic treatment<br>A- Less than 16 visits, B- Between 16–22 visits, C- More 22 visits |
| The number of failures of surgical exposures<br>A- Less than 2 failures B- 2–4 failures C- More 4 failures D- None |
| The number of visits failed to attend during treatment<br>A- Less than 4 visits, B- 4–8 visits, C- More than 8 visits, D- None |

**Table 1: Questionnaire for data collection.**

| Category | Good Prognosis | Average | Poor |
|---|---|---|---|
| Overlap of incisor | No horizontal overlap | Up to half root width | Complete overlap |
| Vertical height | CEJ – halfway up root | >half <full root length | >full root length |
| Angulation | 0–15° | 16–30° | >30° |
| Position of apex | Above canine position | Above 1st premolar | Above 2nd premolar |

Table 1: Prognosis for re-alignment depending on assessment in various categories. Key – average prognosis; : poor prognosis

**Figure 1: Prognosis for realignment depending on assessments across various categories. Key – Green = good prognosis; Yellow = average prognosis; Pink = poor prognosis. adapted from. [17]**

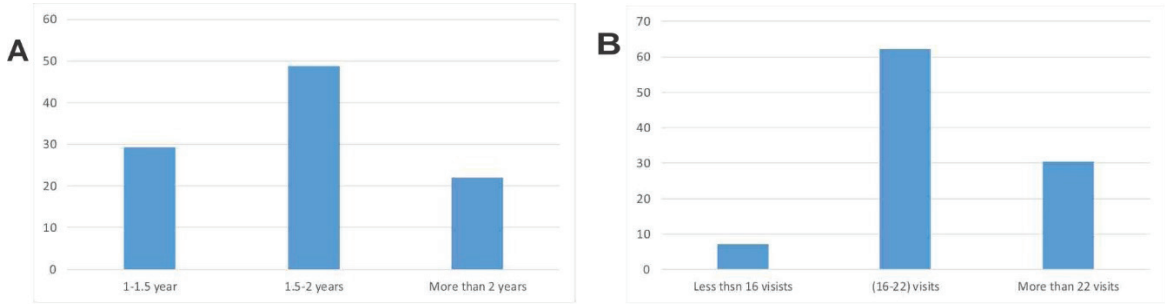


**Figure 2: A) The duration of active orthodontic treatment, B) the number of visits attended by the patient.**

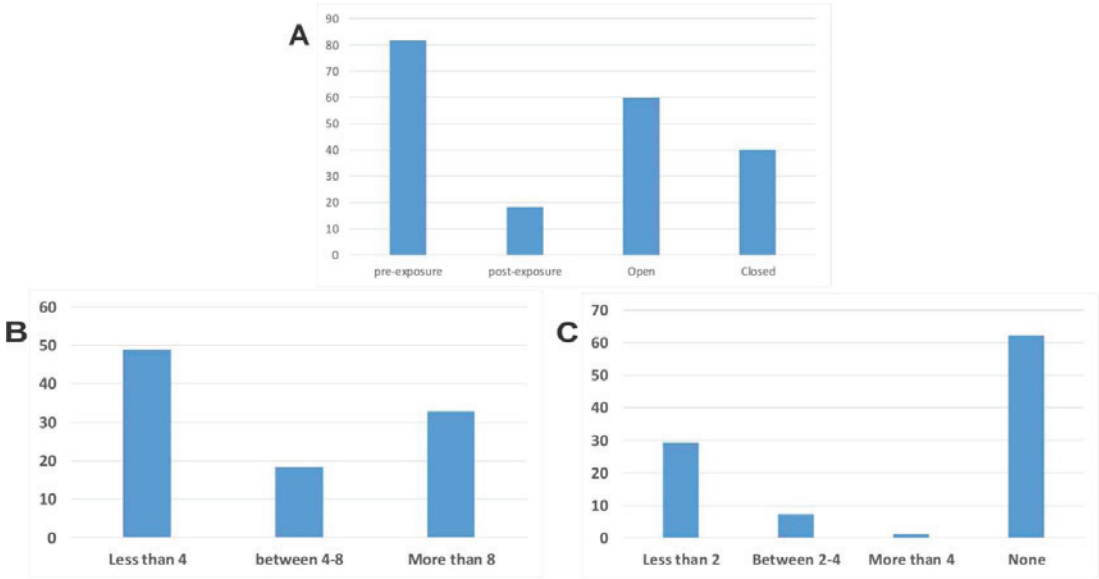


**Figure 3: A) Space creation and type of surgical exposure B) Failed surgical exposure C) Visits failed to attend by the patient.**

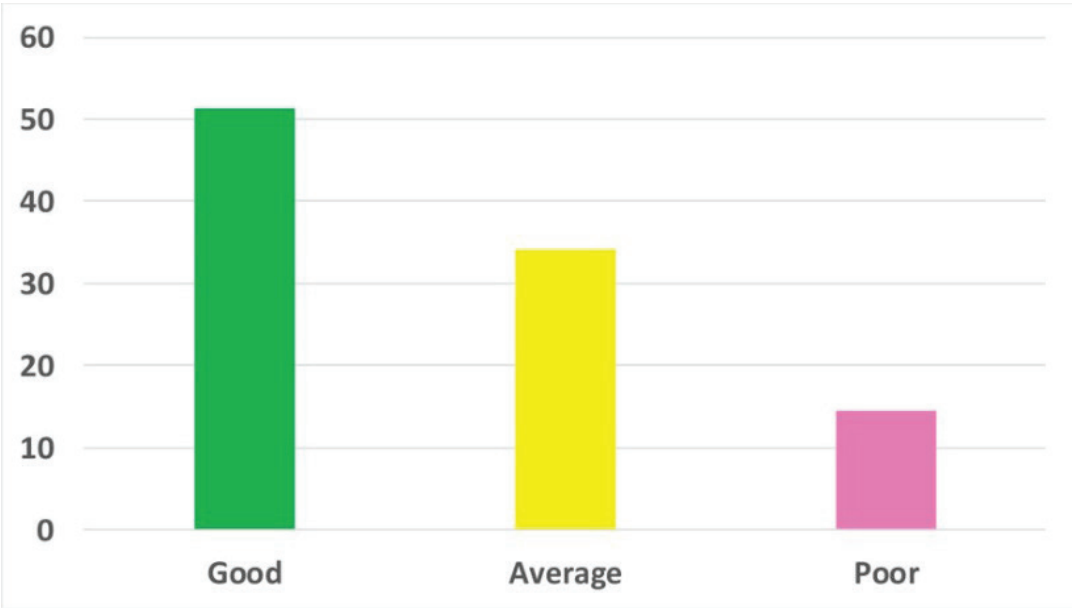


**Figure 4: Prognosis assessment using the chart (%).**

## Discussion

The orthodontic management of palatally impacted canine requires an accurate assessment of the canine location in different dimensions. Accurate localisation helps to surgically expose and retrieve the tooth efficiently and individualise the clinical approach and biomechanics. Both patients and orthodontists need to know the expected treatment duration, which, to a great extent, is affected by the location of the canine. It has previously been observed that the duration of treatment is affected by several factors, including the number of missed appointments, the number of debonded brackets and bands, poor oral hygiene, the number of extracted bicuspid, mandibular plane angle, and age at the start of treatment. [23-25]

Various treatment difficulty indices have been proposed to estimate the severity of impaction. However, this study used a chart that has been recommended by the RCS-Eng guidelines for the management of palatally impacted canines. Four aspects of canine position were assessed, including incisor overlap, vertical height, the

angulation, and the position of the apex. Data from published studies suggest that the treatment duration of palatally impacted canine lasts for an average of 18 to 30 months. [13,26,27] Turning now to the results recorded in the present study, the average active orthodontic treatment time was 21 months, which falls within the range of the studies mentioned previously. The time needed to bring the canine from its location at the time of surgical exposure to the line of the dental arch was about 15 months in the majority of cases (68%).

The average total number of active orthodontic visits was 19 visits which falls within the same range found by other studies (17.7 to 39.8) visits. [22, 28, 29] In response to the prognosis, up to half of the cases (48.7%) had a 'good' prognosis while 36% had 'average' prognosis. This makes a total of 85% of the reported cases who had 'good' and 'average' prognosis. In most of these cases, the treatment time was around 21 months (between 1.5 to 2 years) which might indicate that the chart can be used as a useful tool to estimate the treatment duration. Conversely, other cases within the same categories showed a longer treatment time, which could be related to other factors, including the orthodontist's experience, mechanics, and age of the patients. Another possible explanation for finishing these cases within the expected duration could be attributed to results found in the present study. For example, for 81.7% of cases, the space was created prior to surgical exposure, 62.2% did not have to repeat the surgical exposure, and 48.4% had less than four visits which they failed to attend. Interestingly, these factors were previously emphasised by previous published data as contributing factors adding extra time to bring the impacted tooth into the arch. [15,28-30]

The limitations of the study were that only the best-treated case by each orthodontist was included and it did not involve different types of cases. Additionally, no inferential statistics were made in the present study, which would be more feasible if more cases and different groups were involved.

## Conclusions

On the basis of the results of this study, a rough prediction for the treatment of palatally impacted canine can be made using a difficulty chart. This chart might be helpful in providing information to the patient to estimate the treatment duration. Further studies are required to include other variables to improve the accuracy of the time needed to complete the treatment.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest**: Non

**Funding**: Self-funding

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# Histological and Enzyme Histochemical Changes of Liver Induced By the Action of Maxxthor Insecticide in Male Albino Rats

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## Abstract

The present study aimed to investigate the histological, enzyme histochemical changes and liver function effects of Maxxthor insecticide on albino rats in liver. The experiment included 20 rat which were divided into four groups, the first group 5 rats were considered the control animals and the others were divided equally into three groups with a dose of 0.01, 0.1and 1 mg / kg of body weight, respectively for a period 40 days. The animals given each 48 hours via oral route Maxxthor by tube dosage after dissolved with distilled water. Microscopic examination of liver showed inflammatory cell aggregation around vessels, congestion and dilation of sinusoids hepatocytes hypertrophy with severs inflammatory cells infiltration, kupffer cells proliferation and hydropic degeneration. Enzyme histochemical study of liver showed weak expression of ALP activity in hepatocyte in low dose, sever expression in middle dose, and mild expression in high dose. There was significantly increase in serum aminotransferases (ALT, AST) and alkaline phosphatase (ALP) level in treated group of rats as compared with control group.

***Key words:*** *Maxxthor, Histopathology, Enzyme histochemical,liver function*

## Introduction

Pesticide is any substance or mixture of substance intended to preventing, destroying or controlling any pest, including vectors of human disease or animal species, unwanted plants or animals that cause damage [(1)]. Pesticides spread within the ecosystem elements due to its extensive and random application, and its resist to physical and chemical breakdown and metabolic degradation [(2)]. Pesticides residues accumulation in the environment components over time lead emergence of several ecological and health setbacks [(3)]. Pyrthroid the important new class of synthetic insecticides of the past three decades are rapidly replacing other insecticides due to low mammalian toxicity and an unusually fast biodegradation [(4)]. Pyrethroid act by enhancing sodium channel activity by shifting activation to more negative membrane potentials as well as slowing channel activation [(5)]. Maxxthor is pesticides belong to pyrethroid insecticides type I. The active ingredient in Maxxthor product is bifenthrin , a second generation of synthetic pyrethroid [(6)]. Maxxthor use against termites and labeled for the long term control of wide range of pests including insect pests, vectors, spiders, ticks, and turf insects [(7)]. The neurotoxicity of Maxxthor depend on the affinity to the voltage sodium channels in insects and mammals, where Maxxthor bind to the sodium channel transiently and stop the closing of the channel permanently, leading to permanently depolarize of the membrane, no further action potential can be generated because the resting potential will not be restored [(8)]. pyrthroid induce oxidative stress as mechanism of their toxic action in the body leading to generation of free radicals and influence the activity of antioxidant enzymes in tissues [(9)]. Our goal was to studied the histological changes, ALP activity expression and alternation in liver enzyme induced by the action of Maxxthor .

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## Materials and Method

### Experimental animals and Study Design

The animals examined in this study were mature male Sprague-Dawley albino rats (*Rattus norvegicus* ) with about 8-10 weeks age obtained from biotechnology research center / Al-Nahrian university with an average weight of ( 200-250 gm ) and kept under climate controlled conditions of the animal house with temperature 22-25 $C^{o}$ , good ventilation , regular 12 hours light duration . Rats were randomly divided into four groups five rats for each group and treated as follow: G1 was administrated with 1 ml of normal saline, while G2, G3 and G4 were administrated with1ml of (0.01, 0.1 and 1 mg/kg b.w.) respectively of maxxthor orally once each 48 hours for 40 days.

### Histopathological and Enzyme histochemical study

We began sacrificing the animals at the end of the experiment; Liver was quickly removed. First portion of organ was dissected and fixed in 10 % neutral formalin, dehydrated in ascending grades of alcohol and imbedded in paraffin wax. Paraffin sections (5µm thick) were stained for routine histological study using Hematoxylin and Eosin stain (H&E) [10].

Second portion of organ fixed and dehydrated in a mix of absolute alcohol and cold acetone for different periods and imbedded in paraffin wax. ALP demonstrated in paraffin sections (5µm thick) as described by [11].

### Liver Function

Serum sample was collected for the estimation of liver function (ALT, AST, ALP) by using Linear kit.

## Statistical analysis

The Statistical Analysis System- SAS (2012) program was used to detect the effect of difference groups in study parameters. Least significant difference –LSD test was used to significant compare between means in this study.

## Results and Discussion

Histological effects

Microscopic examination of liver of control rat showed normal structure of the central vein, hepatocytes and blood sinusoids (Figure 1A). Histological changes investigation in sections of liver rat treated with 0.01 mg / kg b.w. of Maxxthor pesticide showed hydropic degeneration in the hepatocytes figure (1B) and dilation in the sinusoids (1C). Aggregation of inflammatory cells near central vein and congestion with dilation of sinusoids were seen in liver section of rat treated with 0.1 mg/kg b.w. of Maxxthor pesticide after 40 days of treatment as shown in figure (2A,B) and proliferation of hepatocyte and hemorrhage with proliferation of kupffer cells figure (2C,D). Hydropic degeneration in hepatocytes with degradation of chromatins cells and aggregation of inflammatory cells figure (3A,B) was in liver of rats treated with 1 mg\kg body weight.

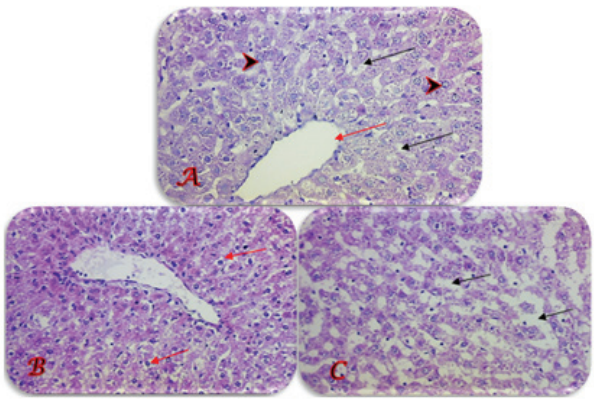


**Figure (1): Crosse section in liver of rat detected by H&E staining A: normal liver of rat showing hepatocytes (head arrows), central vein (red arrow) and sinusoids (black arrows),B: treated rat with 0.01 mg/kg body weight of Maxxthor showing (A): hydropic degeneration in the hepatocytes (red arrows) ,C: dilation in the sinusoids (black arrows) (A,B and C, X10) .**

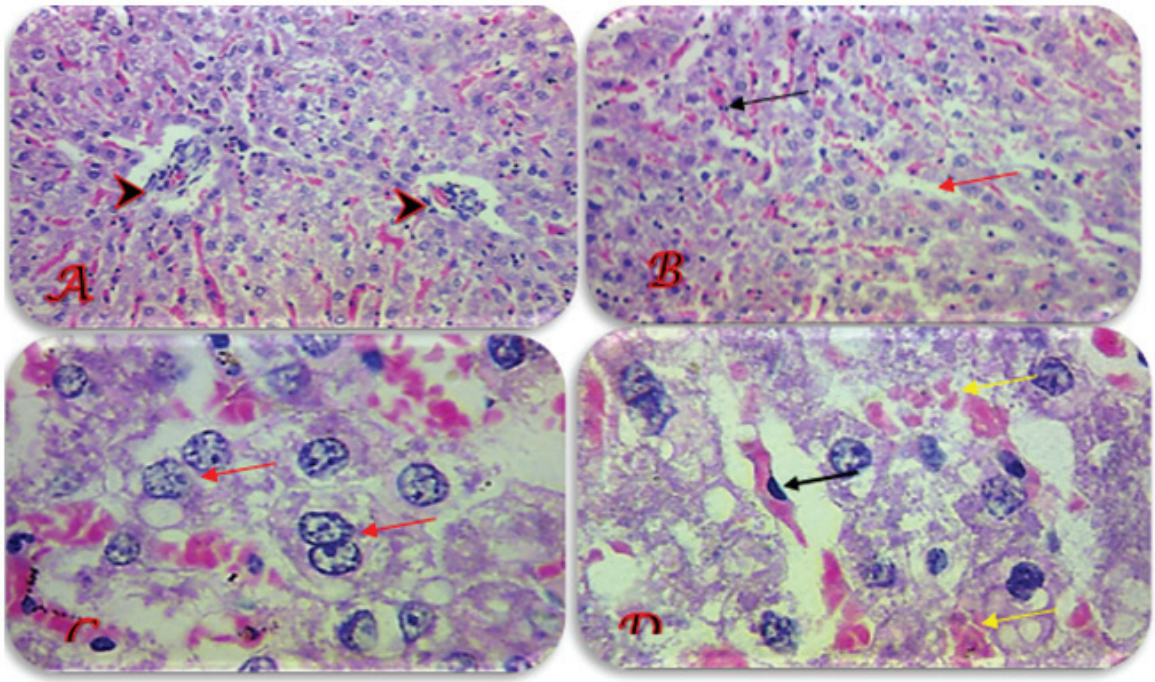


**Figure (2): Cross section in liver of rat treated with 0.1 mg/kg body weight of Maxxthor detected by H&E staining: A. aggregation of inflammatory cells near central vein (head arrows) (X10). B: and congestion (black arrow) with dilation of sinusoids (red arrow) (X10), C: proliferation of hepatocytes (red arrows) (X40), D: hemorrhage (yellow arrows) with proliferation of kupffer cells (black arrow) (X40).**

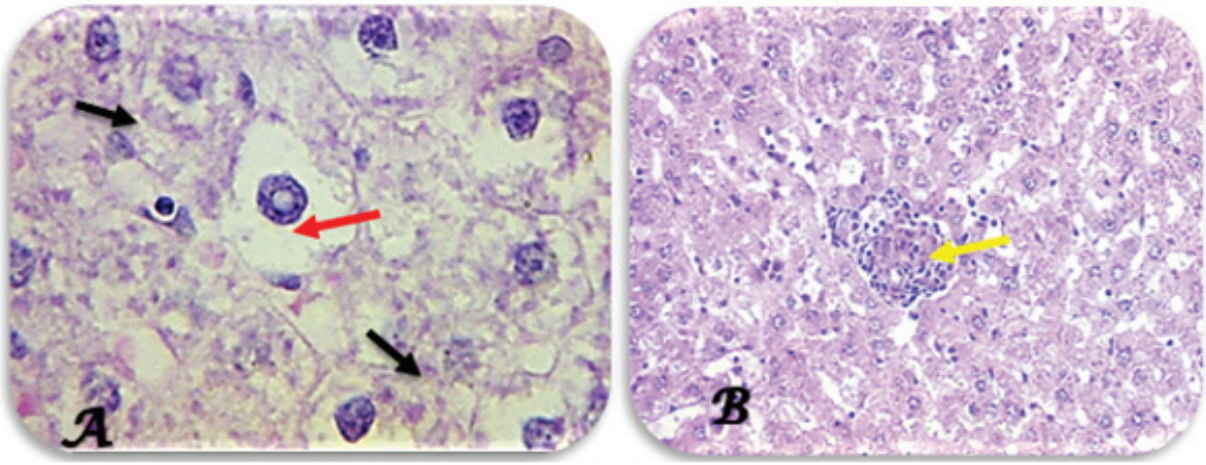


**Figure (3): Crosse section in liver of rats treated with 1 mg/kg body weight of Maxxthor showing A: hydropic degeneration in hepatocytes (red arrows) with degradation of chromatins cells (head arrows) B: showing granuloma consist of aggregation of inflammatory cells (yellow arrow) [H &E (A)X10 & (B) X40].**

This result agreement with [12] who confirmed the damage caused by cypermethrin pesticide in the liver through degeneration of hepatocytes, infiltration of inflammatory cells, necrosis and mitochondrial swelling. Vascular degeneration in the hepatocytes as well as congestion in the central vein and sinusoid in rat liver when treated with deltamethrin was recorded by [13]. These changes in liver tissue could be explained by understanding that bifenthrin is metabolized in the liver by cytochrome P450 through hydrolytic ester cleavage and the oxidative route to produce acid and alcohol moieties [14]. Congestion and hemorrhage could be as a result to increased blood flow to the inflamed area due to toxic substance of the pesticide. Proliferation

and hyperplasia of the hepatocytes indicate the role of pesticide with its toxic effect in causing important change, that may be the first signs of the occurness of cancer. Granuloma from aggregation of inflammatory cells to the toxic effect of the pesticide that cause inflammatory reaction in liver tissue, which resulted in the attraction of neutrophil and mononuclear cells of the site of injury to remove damaged tissue [15]. Intoxication of rats with pesticide led to generation of ROS, the over production of ROS metabolites can creates lethal chain reaction, that involve oxidation and damage to structures which are crucial for integrity of cell and these free radical lead to membrane and macromolecule damage [16 , 17] .

**Enzyme histochemical study**

Cross section in control liver rat showing no expression of ALP activity represented in figure (4A). While treated rat with 0.01 mg\kg b.w. of maxxthor showing weak expression of ALP activity in hepatocyte figure (4B), but figure (4C) show sever expression of ALP activity in hepatocyte and figure (4D) show mild expression of ALP activity in hepatocytes.

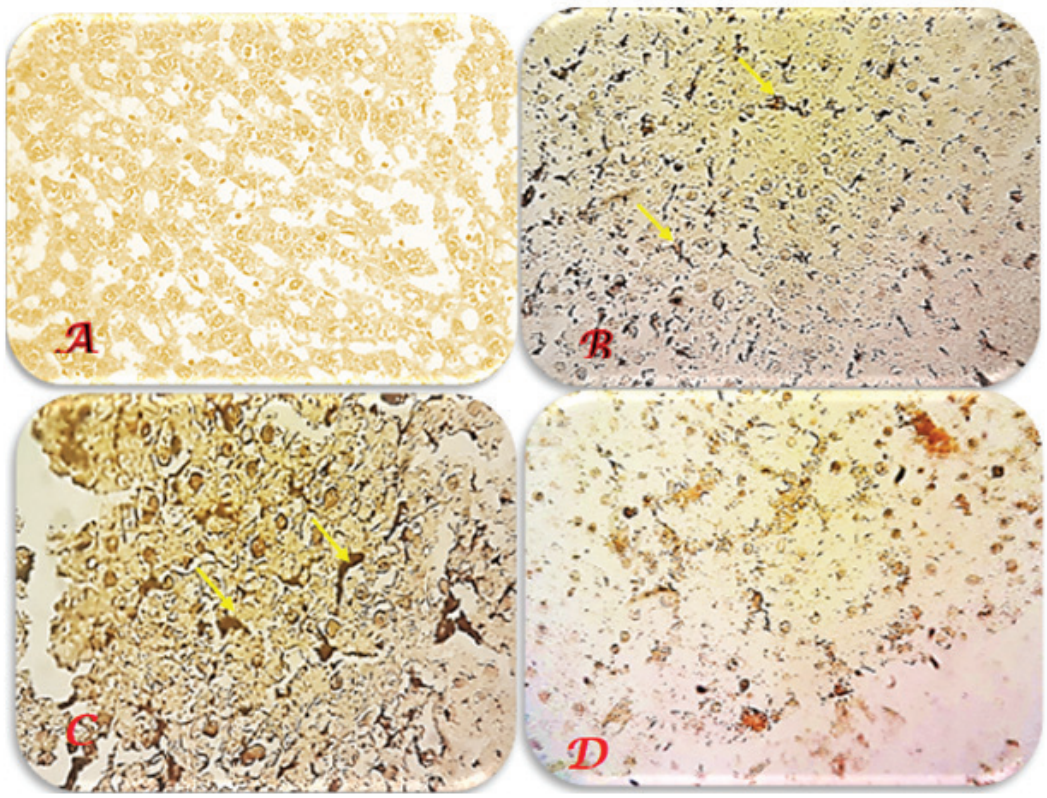


**Figure (4): Cross section in liver of rat detected: A. control group showing no expression of ALP activity (X10).B: treated rat with 0.01 mg/k b.w. Maxxthor showing weak expression of ALP activity in hepatocytes (arrows) (X40)., C: the treated rat with 0.1 mg/k b. w. Maxxthor showing sever expression of ALP activity in hepatocytes (arrows)(X10), D: treated dosage 1 mg/k b.w. Maxxthor showing mild expression of ALP activity in hepatocytes (X10).**

The ALP is eliminated by bile secretion, any increase or accumulation in ALP amount in liver cells indicate a disturbance mechanism of secrtion [18]. Toxic lesion, hepatitis, and congested liver lead to accumulation of ALP in cell, that accumulation indicate a function disturbance of the liver in biobsy or autoptic lived tissue [19]. Increase activity in ALP can be attributed initially to some pathophysiological condation in liver as a result of pesticide intoxication, may be due to damage in membrane permeability of hepatocytes, resulting in leakage of this enzyme, that

mean maxxthor capable of altering normal hepatocytes architecture [20, 21]. Another possibility for the increase in the activity of alkaline phosphatase may be related to the destruction of the hepatic smooth endoplasmic reticulum membrane in the insecticide intoxicated animals [22]. Sublethal concentration of chlorpyrifos to Gambusia fish lead to increase expression of ALP enzyme activity in liver and kidney tissue indicate that pesticide disturpe the chemical constituents of the fish leading to cell damages and finally mortality of the fish [23]. The increment in activity of hepatic ALP activity due to the cellular damages caused by hepatotoxin or a response to overcome toxicity of pesticide [24].

**Liver function study**

Table (1) summarized the results of Maxxthor effect on liver function in rats after 40 days of treated with (0.01,0.1, 1) mg/kg b.w. Maxxthor treatment has highly significant ($p<0.01$) increased in the serum AST, ALT and ALP in all treated groups as compared with control group.

**Table 1: Effect of Maxxthor (0.01, 0.1 and 1 mg/gk. b.wt.) on liver function of rats**

| Group | Mean ± SE | | |
|---|---|---|---|
| | AST U/L | ALT U/L | ALP U/L |
| G1:Control | 56.28 ± 2.14 d | 24.99 ± 0.96 d | 102.81 ± 2.76 d |
| G2: treated with 0.01 mg/kg/b.wt. of Maxxthor | 69.26 ± 3.07 c | 32.21 ± 1.89 c | 141.98 ± 2.57 c |
| G3: treated with 0. 1 mg/kg/b.wt. of Maxxthor | 92.44 ± 2.40 b | 44.79 ± 2.54 b | 185.65 ± 2.97 b |
| G4: treated with 1 mg/kg/b.wt. of Maxxthor | 146.68 ± 4.56 a | 70.10 ± 3.27 a | 322.46 ± 12.71 a |
| LSD value | 9.147 ** | 6.667 ** | 19.488 ** |

Means having with the different letters in same column differed significantly, ** ($P<0.01$).
AST = Aspartate aminotransferase , ALT = Alanine aminotransferase , ALP = Alkaline phosphtase

This results agreement with Shakoori *et al*. [25] when treated female rabbits' high doses of bifenthrin pesticides within 4 days. Mansour *et al*. [26] study **the revealed that amounts of AST and ALT enzymes were elevated following intoxication of male rats with the insecticides and their mixture**. Exposure to pesticides lead to liver damage and leakage of cytosolic enzymes from hepatocytes and other body organs into blood [27].In fact, transaminase (AST, ALT) are important and critical enzyme in the biological processes. These enzyme are involved in the breakdown of amino acids into α keto-acids and responsible for detoxification process, metabolism and biosynthesis of energetic macromolecules for different essential functions. Increased amount of these enzymes are indices on cellular smashing and loss of functional integrity of cell membranes in the liver [28]. **Mansour and Mossa [29] found that the activities of transaminases were increased in animals after exposure to pesticides.** Increase in ALP activity in serum can be attributed to some pathophysiological changes in liver as a consequence of pesticides intoxication probaplly due to damage in membrane permeability of hepatocytes, resulting in leakage of this enzyme and pesticide can alter normal hepatocellular architecture [30]. Liver enzymes Elevation may also be due to increased gene expression after long term requirement of detoxification of pesticides [31].

## Conclusion

Based on the overall findings from present investigation, it obvious that Maxxthor is toxic to liver following oral treatment of rats at the selected doses. Maxxthor induce pathological changes in the liver tissues and elevated ALP activity in liver tissues. Oral treatment of Maxxthor increased the serum AST, ALT and ALP in male albino rats.

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding**: Self-funding

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# The Nature of the Il17 Cytokine Response In Rabbits Prime-Boosted With Eschrchia Coli-Pseudomonas Aeruginosa Prototype Bacterin Combinations

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## Abstract

The prototype E .coli - P. aeruginosa heat killed bacterin balanced and unbalanced bacterin combinations,as well as monotypic E. coli and single P. aeruginosa bacterins were developed. They were prime-boosted rabbits by homologous prime-boost protocols. At the end of the specific immune-priming protocols ,rabbits were bleed, sera saved in 0.5 ml aliquots at -18C till testing due time.IL17 Eliza assay was done on the test and control sera. Single strength balanced combined bacterin combination induced increase in the mean IL17 concentration means as compared to monotypic, double balanced ,un-balanced bcterin combinations and control. The other combinations were showing inhibition in IL17 concentration means than control .The immune interference matched To as: one bacterin enhance the other, and one damp the other. Enhancement of IL17 response single strength combination might be a promise for efficacy of such combination in regulation and protection against natural or experimental infectious challenges .

***Key Words:*** *Bacterin, Combination,enhance ,Immune, interference ,inhibition.*

## Introduction

The T helper 17 cells are subsets of helper T cells with biological immune-cross road functions both at natural[innate] and adaptive[acquired] immune responses towards infections [1 ].IL17 have narrow range of biological activities. It induces IL6,IL8 and granulocyte stimulating factor by bone marrow stromal cells, endothelial cells ,and fibroblasts .But it has no effects on production of IL4,IL6,INFgamma and IL10 by peripheral blood mononuclear cells [2,3].IL17 cytokine has profound role in primary immune responses against infections in one hand [ 4 ].On the other hand IL17 has critical role for the vaccine induced memory immune responses against infectious diseases [ 5 ]

There are some intracellular bacteria require IL17 to derive TH1 cell immunity in the infected host [ 5,6 ].The Th17 cytokine regulate the host immune mechanisms during intracellular bacterial infection is performed through; DC regulation, neutrophil recruitment,TH1 modulation and Treg , balance [6] The human Pseudomonas mucosal infections of lungs induced TH17 ,the Th17 cytokine recognize a protein Pseudomonas sub-unite that has a promising potential as a vaccine candidate for P. aeruginosa infections [7] .The vaccination with bacterin induce Th17 cell responses accompanied by long term memory TH17 cell stable subsets lasting up to post-vaccination state [ 8 ] .The objective of the present work was to report on the nature of IL17 cytokine responses and shed a light on the immune interference of combined E.coli-P. aeruginosa bacterin combinations in a lapin model.

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## Materials and Method

### Bacterin Starter Strains:

From a series of patients with urinary tract infections ,a uropathic gram negative isolates were purified and identified by veitic identification system as E.coli and P.aerugnosa .They were grown in broth media and dense

inocula were transferred to brain heart infusion broth tubes then layered by sterile liquid parafine as cryo-protectant and kept at -18C in the refrigerator chest freezer till use for bacterin preparation [9].

**Bacterin Designations**

To make ease description with in the text we adopt abbreviated designations for the developed bacterins, Table 1.

**Table 1 : Abbreviated bacterin designations.**

| Bacterin Type | Description | Desigations |
|---|---|---|
| Organismic heat killed E.coli bacterin | E.coli 1.5x 10 to eight[one x strenght] | BEC |
| Organismic heat Killed P.aeruginosa bacterin | P.aeruginosa 1.5x 10 to eight[one x strength] | BPA |
| Balanced combined one x strength E.coli- P.aeruginosa | E.coli 1.5x10 to 8- P.aeruginosa 1.5 x10 to 8 | X EC-X PA |
| Balanced two x strenght E.coli-P.aeruginosa | E.coli 3x10 to 8-P.aeruginosa 3x10 to 8 | 2XEC- 2XPA |
| Unbalanced oneX strenght E.coli-2X strength P.aeruginosa | E.coli 1.5x 10 to 8-P.aeruginosa 3x10 t0 8 | 1XEC-2XPA |
| Unbalanced two x strength E.coli- one x strength P.aeruginosa. | E.coli 3x10to 8-P.aeruginosa 1.5x10 to 8 | 2XEC-XPA |

**Bacterin preparation;**

A 0.1ml from a fresh 18hrs brain heart infusion broth cultures which constitute the seed lot of the starter bacterin strains were transferred into50 ml sterile brain heart infusion broth in 100ml size conical flasks. Then incubated at 37C in shaker water-bath with 60 shake per minute for 18hrs.Growth harvested into a series of sterile centrifuge tubes of 10 mls size .Tubes were centrifuged at 5000 rpm for 15 minutes. Supernatants were discarded and pellet s were kept. The pellets were reconstituted with sterile saline to the original volumes for triple wash at 5000rpm for 10 minutes. Triple washed pellets were reconstituted with 5 ml sterile saline for each tube. The 5ml bacterin containing tubes were set onto test tube racks and left in water-bath at 60C for one hr. The tube containing suspensions were made in bulks. These bacterin preparations were checked for purity and ratified as one X strength 1.5x10 to eight and two X strength 3x10 to eight bacterin units per/ml. These preparations stands as a prototype bacterins .After adjustment to one and two x strength they were mixed in an equal volumes to form the balanced and unbalanced combinations prior to specific immune priming of rabbits [10]

**Purity**

The final batch to be used prototype single and combined bacterins were checked for sterility in which inocula from each bacterin preprations was quadrate streaked onto nutrient agar plates and incubated for 18hrs at 37C.Presence of any contaminating bacterial growth make preparation as unsuitable for experimentation [11].

**Rabbits**

A group of adult Newzland male rabbits with three to five months old and 1-1.5 body weight were brought to the animal house, College of science, university of

Babylon. These rabbits were checked for the presence of natural serum antibodies for common bacterial pathogens especially those for E,coli and P.aeruginosa .Absence of such serum antibodies make rabbits usable for this study. Rabbits were acclimatized to two weeks in housing conditions. Then categorized into three groups and marked as ; control ,safety and test as in the followings;

Saline control……..5 rabbits

Safety …….7x two rabbits

Test Groups;

BEC……5 rabbits

BPA……..5 rabbits

XEC-PA……5 rabbits

2XEC-PA……..5 rabbits

XEC-2XPA…….5 rabbits

XEC-2XPA……..5 rabbits

Rabbits kept during the housing condition under ad libitum of food and drinks. They were handled and managed following the standard international rules for animal humanity regulations [12] .

Safety;

A volume of 0,1 ml from each of the to be used prototype bacterins was intra-peritone injected in rabbits of safety group. Then followed by follow up for five days to exclude gross and internal organ pathologies for the test and controls [11] .

Homologous Prime-Boost Protocols:

A two ml amounts from each of the prototype pure bacterins were primed into each rabbit of the test groups. One ml was IM injected and second one distributed SC in sub-clavian and pelvic regions in week a part for three weeks followed by one week leave. Then bleed through cardiac puncture rout [13].

Immune Function Tests:

Blood sample collection was done on both of test and control groups by cardiac puncture and saving sera [14] ,leukocyte inhibitory factor [15] ,and agglutination assays as in [16].

Bio-metery:

Means and standard deviations were calculated as in [17] .

## Results

I-Bacterin Development:

The developed monotypic bacterins ,balanced and unbalanced bacterins were found ,pure ,safe, antigenic and immunogenic in rabbits.

II-IL17 cytokine Responses:

i-BEC –IL17 and BPA-IL17 responses,

IL17 mean concentration was 40,12 pg/ml. in BEC primed rabbits. While ,for BPA primed rabbits was 38,48 pg/ml. as compared to normal as 45.49 pg/ml., Table 2

ii- Balanced combination of XEC-XPA-IL17 and 2XEC-2XPA cytokine response;

IL17 cytokine response of rabbits primed with XEC-PA was48.38 pg/ml. While that for 2XEC-2XPA was 38.75 pg/ml. as compared to control rabbit was 45.49 pg/ml.,Table2

iii-Unbalanced Combinations IL17 cytokine responses;

The IL17 in XEC-2XPA and 2XEC-XPA were 37,65 pg/ml and 36.44 accordingly as compared to control 45.45 pg/ml., Table 3.

iv-IL17 cytokine response features,

Both of BEC and BPA monotypic heat killed bacterins priming have shown IL17 inhibition than normal. XEC-XPA has shown enhancement in IL17 concentration means than the mono- typic bacterins and normal controls. The 2xEC-2XPA,XEC_2XPA, and xEC-2XPA combinations were with inhibiting concentration means than normal rabbits cytokine responses, Tables 2 and 3.

**Table 2:Rabbits IL17 cytokine response to balanced combinations**

| **Bacterin type** | **IL17 pg/ml. Mean +-SD** |
|---|---|
| XEC-XPA | 48.38+-3.9 |
| 2XEC-2XPA | 38.75+-4.05 |
| BEC | 40.12+-2.97 |
| BPA | 38.48+-4.5 |
| Control | 45.45+-1.58 |

**Table 3:Rabbits IL17 cytokine responses to unbalanced bacterin combinations**

| Bacterin types | IL17 pg/ml. Mean+-SD |
|---|---|
| XEC-2xPA | 37.65+_3.05 |
| 2X-XPA | 36.94+_11.37 |
| BEC | 40.12+_2.97 |
| BPA | 38.48+_4.5 |
| Control | 45.45+_1.85 |

## Discussion

The cytokine IL17 concentration means in response to monotypic BEC and BPA indicated that these bacterins were inducing IL17 responses but such responses were of lower grade than saline control cytokine response. A finding which may point to an inhibitory insults [18] like presence of weak suppressive antigenic epitope [ 19,20] .The response of rabbits IL17 to two strength balanced and unbalanced bacterins combinations can be attributed to antigenic competition and/ or the antigenic quantity effects [21,22,23,24 ] .Single strength balanced combination has shown increase IL17 concentration than control rabbits which points to an enhancement in the response than the monotypic bacterins and control .Thus ,lapin IL17 cytokine response to monotypic and combination bacterins expresses two forms immune interference as; one damp the other and one enhance the other [25,26,27] .Heat killed whole cell E coli and P.aeruginosa bacterins induce lapin IL17 responses, though such responses were affected by antigenic quantity, antigenic competition, weak suppressive epitope and epitope-epitope enhancement, the immune interference in both positive and negative forms [21-27] .The enhancement was in rationally accepted forms [within the limits for the absence of immunopathology]of immune interference may bears potential benefits for the host contracting such forms of combined infections and might holds a promise for bacterin efficacy in regulation and/or protection against natural or experimental challenges [28-30]

## Conclusion

E.coli-P.aeruginosa combined heat killed bacterins were laboratory scale developed and evaluated in a lapin model. These developed monotypic and combined were inducing IL17 cytokine responses. Such IL17 responses were affected by antigen quantity ,antigen competition , weak suppressive epitope ,epitope-epitope enhancement ,the immune interference in both negative and positive forms.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding**: Self-funding

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# Effect of Hearing Impairment on Behavior and Communication of Children in Schools and Special Education Centers in Mosul City

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## Abstract

**Objectives:** To identify the effect of hearing impairment on children behavior in daily activities and communication with peers and problems facing teachers of HI children in Iraqi environment. **Methods :** the strength and difficult questionnaire (SDQ) was used to measure the behavioral, and peer problems questionnaire to measure communication disorders of children with HI based on parents and teachers in (209) children (123) HI and (86) normal hearing control group. **Results:** on parent teacher questionnaire significantly higher behavioral problems for HI children compared with control group (p-value **0.043< alpha value 0.05)** and (chi-square 7.321) so increase the emotional problems (p-value 0.035)and peer problems (0.026) of HI children its highly significant found of behavioral problems, so 65% of hearing impaired children had communication problems with others and environment. The teachers facing many problems when deals with HI but the most common one difficult when communicate with them because the limited capabilities available and modern educational methods for teaching the HI children. **Conclusions:** The majority of hearing impaired children have congenital cause for their hearing loss. Behavior problems appear more common in children with hearing loss and communication problems. The vast majority of teachers agree that there are problems facing students with hearing impairment, and these difficulties need to be dealt with the benefit of their children and the community as a whole.

***Keywords:*** *hearing impairment, behavioral, communication, Mosul; children; activity.*

## Introduction

Hearing Impaired category is an important issue that should have taken enough care in one form or another . Hearing loss is a common problem in all ages and represents a. HI directly affects the quality of life and it is most often manifested in communication difficulties.

deviations in emotional and social development[4].

"WHO has documented and continues to document the increase in the proportion of HI people around the world, estimated that in 2030 the number of people with hearing loss will be around 630 million'', and within 2050 the number of injured will be 900 million[10].

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The effect of hearing impairment varies according to variables , type and degree of hearing disability , age at which they occur, and the extent to which hearing devices are used[6].

Hearing loss is categorized as **mild** (20-30 dB hearing level, HL), **moderate** (30-50 dB HL), **moderately severe** (50-70 dB HL), **severe** (75-85 dB. HL), or **profound** (>85 dB) [5].

Recently, the WHO Studies concerned with children had demonstrated that children with hearing loss develop more aggressive behavior[8].

Communication difficulties caused by hearing impairment directly affect the quality of life of affected children. Difficulties in communication can lead to an impairment of emotional and social development. It is well known that good hearing is essential for the

development of speech and language[1].

## Method

### participants

the study was school based populations (HI) children and normal hearing (control group) **(table 1)**. The selected intentional sample (non-probability) consisted (123) students (64 males) and (59 females) ,selected from several special education centers in Mosul, which was confirmed by medical examination as well the severity and cause of hearing loss, were include in this study , and (86) children (male 55.4%) and ( female 44.6%) of the same age group of case samples( 6-12 ) years as control group in order to compare the behavioral and communication problems. So **(50)** teachers in the field of special education were selected to answer the questionnaire prepared by the researcher and evaluated by experts to be suitable for the sample community and for the internal consistency of the questionnaire parts.

**procedure and measure:** After presenting the basic approvals , data were collected by interviewing the hearing impaired students to fill their questionnaire as well as in addition there were several meeting with the teacher to enquire about the child's behavior and to fill the teachers part of the questionnaire. Referral to the student registration data and medical examination when enrolled in the special education classes for the purpose of obtaining the degree of hearing loss and its causes.

### measure of behavioral problems

The present study confirmed the higher behavioral problems for children with HI compared to hearing controls. Children with hearing loss show an elevated level of behavior problems were measured using the Strengths and Difficulties Questionnaire(SDQ)[11].

This is a widely used behavioral screening questionnaire that provides data on children and young people's behaviors, emotions and relationships.

### measure of communications problems

To measure communication problems of (HI) children, the researcher used the "peer relationship questionnaire.

### measures of teachers problems facing them.

To measure the problems facing teachers who deal with the hearing-impaired category, a (12-items) questionnaire was built that obtained acceptable honesty and consistency and evaluation by experts.

## Results

### characteristics of the samples

**Table-1** show that there were no statistically significant differences between control group and experimental group where the value of the chi- square test **(5.000**) and degrees of freedom **(6)** and the significant value (**0.403)** more than p- value (0.05%) which indicates the convergence of the homogeneity of the control sample and the experimental group.

**Table (1) General characteristics of the children with hearing loss (123) and control group (86).**

| | | | Hearing impaired | | Control | | | |
|---|---|---|---|---|---|---|---|---|
| **N** | **Paragraph** | **Var.** | **F (%) (HI)n=123** | **M+S.D (HI)** | **F(%) (NH)n=86** | **M+SD (NH)** | **X2** | **P- value** |
| 1 | Gender | Male | 64 (52%) | 1.48(.50) | 48 (55.8%) | 1.44(.50) | 5.000 | 0.403 |
| | | Female | 59 (48%) | | 38 (44.2%) | | | |
| 2 | Age | 6-7 years | 34 (27.6%) | 2.14(.82) | 33 (38.4%) | 1.76(.68) | | |
| | | 8-10 years | 38(30.9% | | 41 (47.6%) | | | |
| | | 11-12 years | 51(41.5%) | | 12 (14.0%) | | | |
| 3 | Center/ School | Center | 91(74%) | 1.26(.44) | 27(31.4%) | 1.69(.46) | | |
| | | School | 32 (26%) | | 59 (68.6%) | | | |

**Table( 2) Hearing impairment children health status information n=(123).**

| S | Paragraph | Var. | F | % | Mean | S.D |
|---|---|---|---|---|---|---|
| 1 | Level of loss | Mild | 18 | 14.6% | 2.77 | 1.039 |
| | | Moderate | 29 | 23.6% | | |
| | | Severe | 39 | 31.7% | | |
| | | Profound | 37 | 30.1% | | |
| 2 | The age of HL detection | Less than 3 years | 86 | 69.9% | 1.30 | 0.460 |
| | | More than 3 years | 37 | 30.1% | | |
| 3 | Cause of hearing loss | Idiopathic | 31 | 25.2% | 1.33 | 0.071 |
| | | Disease | 34 | 27.6% | | |
| | | Congenital | 45 | 36.6% | | |
| | | Accident | 13 | 10.6% | | |
| 4 | What is the disease cause hearing loss | Otitis media | 22 | 64.7% | 1.35 | 0.485 |
| | | Encephalitis | 12 | 35.3% | | |
| 5 | child wear a hearing aid | No | 49 | 39.8% | 1.60 | 0.492 |
| | | Yes | 74 | 60.2% | | |
| 6 | Use hearing aid | One ear | 33 | 44.6% | 1.55 | 0.500 |
| | | Both ears | 41 | 55.4% | | |
| 7 | Was the child taken to a speech therapist | Yes | 74 | 60.2% | 1.60 | 0.490 |
| | | No | 49 | 39.8% | | |
| 8 | Filling the questionnaire by parents/teacher | Parents | 47 | 38.2% | 1.25 | 0.453 |
| | | Teacher | 76 | 61.8% | | |
| 9 | Does the child have difficulty in speech? | Yes | 81 | 65.85% | 1.58 | 0.451 |
| | | No | 42 | 34.15% | | |

**Table(2)** show severe to profound hearing loss (30.1-31.7)%. Most of them were diagnosed with a disability at less than (3)years old.(at this age because this age the child begins to communicate with others, speak and start talking). Most of these cases were due to congenital causes (36.6%) .Most of study children wear hearing aids in both of the ears by(both ear affected) 55.4%.The majority of them live in families without a disability 71.5% and show a great response about that the child has speech difficulty at 65.85%.

**Table (3) Teacher / parents information about the behavior of the hearing impaired n=(123) children and normal hearing children n=(86)of study sample**

| Scale axis | Questions | Sub averages mean (HI) | Total axis | Sub average mean (NH) | Total axis | X2 p-value |
|---|---|---|---|---|---|---|
| Emotional symptoms | Q 3 | 1.67 | 1.81 | 1.35 | 1.25 | 7.321 |
| | Q 8 | 1.79 | | 1.30 | | |
| | Q13 | 1.80 | | 1.22 | | 0.035 |
| | Q 16 | 1.96 | | 1.24 | | |
| | Q24 | 1.85 | | 1.18 | | |
| Behavioral problems | Q 5 | 1.93 | 1.82 | 1.33 | 1.21 | 8.120 |
| | Q 7 | 1.85 | | 1.41 | | |
| | Q12 | 1.71 | | 1.18 | | 0.043 |
| | Q 18 | 1.98 | | 1.13 | | |
| | Q22 | 1.63 | | 1.01 | | |
| Hyperactivity | Q21 | 1.71 | 1.77 | 1.61 | 1.54 | 10.000 |
| | Q 25 | 1.55 | | 1.44 | | |
| | Q 2 | 1.80 | | 1.53 | | 0.220 |
| | Q 10 | 1.94 | | 1.28 | | |
| | Q 15 | 1.89 | | 1.67 | | |
| Peer problems | Q 11 | 1.82 | 1.83 | 2.08 | 1.60 | 9.989 |
| | Q 14 | 1.80 | | 1.34 | | |
| | Q 6 | 1.72 | | 1.22 | | 0.026 |
| | Q19 | 1.93 | | 1.34 | | |
| | Q23 | 1.92 | | 2.03 | | |
| Personal social behavior | Q 17 | 1.76 | 1.75 | 1.64 | 1.91 | 8.000 |
| | Q 4 | 1.83 | | 2.05 | | |
| | Q 9 | 1.85 | | 2.06 | | 0.333 |
| | Q 20 | 1.71 | | 1.92 | | |
| | Q 1 | 1.64 | | 1.92 | | |

| | | | | |
|---|---|---|---|---|
| | Whole average | 1.796 | | 1.506 |

**Table (3)** shows a comparison between control and experimental group by chi-square test to compare the averages, showed the presence of statistically significant differences between the two groups in show include behavior disorder chi-square (8.120) and p-value (0.043). It is less than alpha value (0.05), which indicates the presence of statistically significant differences for behaviors, due to hearing impairment. So the emotional symptoms, showed statistically significant differences between the two groups. The value chi-square to 7.321 with a significant value (0.035), which is smaller than the alpha value (0.05). This indicates the effect of hearing impairment on behaviors.

**Table(4) Communication with others and the surrounding environment for hearing impaired and normal hearing children.**

| N. | Qus. | (HI) | | Mean (HI) | S.D (HI) | (NH) | | Mean (NH) | S.D (NH) | X2 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Yes | No | | | Yes | No | | | p-value |
| 1 | Q 1 | %77.2 | 22.8% | 1.63 | 0.486 | 82.6 | 17.4 | 1.83 | 0.38 | 6.000 |
| 2 | Q 2 | %65 | 35% | 1.65 | 0.479 | 72.1 | 27.9 | 1.72 | 0.45 | 0.423 |
| 3 | Q 3 | %66.7 | 33% | 1.67 | 0.490 | 89.5 | 10.5 | 1.90 | 0.30 | |
| 4 | Q 4 | 59.3% | 40.7% | 1.41 | 0.493 | 67.4 | 32.6 | 1.67 | 0.47 | |
| 5 | Q 5 | 56.9% | 43.% | 1.57 | 0.497 | | | | | |
| 6 | Q 6 | 76.4% | 23.6% | 1.76 | 0.426 | | | | | |
| 7 | Q 7 | 64.2% | 35.8% | 1.64 | 0.481 | | | | | |
| 8 | Q 8 | 65% | 35% | 1.65 | 0.479 | | | | | |
| 9 | Q 9 | 62.6% | 37.4% | 1.63 | 0.486 | | | | | |
| 10 | Q 10 | 59.3% | 40.7% | 1.59 | 0.493 | | | | | |
| 11 | Q 11 | 52% | 48% | 1.52 | 0.502 | | | | | |
| 12 | Q 12 | 35% | 65% | 1.35 | 0.479 | | | | | |

**Table (4)** explain the first four paragraphs(Hearing impaired children group and control group) that include both groups there were no statistically significant differences between the control group and the experimental group where the value of chi-square test (6.000), degrees of freedom (6) and p-value (0.423) was greater than the alpha value (0.05%) ,impairment greatly affects the relationship of students with friends and affects communication with others in the school and the surrounding environment, according to the majority of responses to questionnaire items with a number of 80

responses with a rate of (65%), with a general average of (1.60).

**Table (5) The teachers 'responses regarding the hearing impaired children, the problems and challenges.**

| N. | Paragraph | Responses | | Mean | S.D |
|---|---|---|---|---|---|
| | | Yes | No | | |
| 1 | Are you a graduate of special education | 44% | 56% | 1.44 | 0.051 |
| 2 | Do you have in the center modern means to educate people with hearing impairment | 38% | 62% | 1.38 | 0.490 |
| 3 | Are you talking to them and directing them loudly | 74% | 26% | 1.74 | 0.443 |
| 4 | Do you support setting up courses for teachers to train them in forms of communication with the them? | 86% | 14% | 1.86 | 0.351 |
| 5 | Do you support the presence of a speech specialist in special education centers and schools | 70% | 30% | 1.70 | 0.483 |
| 6 | Do you see progress in the field of special education in the city of Mosul | 40% | 60% | 1.40 | 0.495 |
| 7 | Is your center better from other centers in the city | 52% | 48% | 1.52 | 0.505 |
| 8 | From your point of view as a special education teacher, is it easy to deal with the hard of hearing class | 32% | 68% | 1.32 | 0.471 |
| 9 | Would the results of such studies benefit the hearing impaired group | 60% | 40% | 1.60 | 0.495 |
| 10 | Do you support teaching the hearing impaired sign language | 36% | 64% | 1.36 | 0.485 |
| Weighted average of the survey as a whole | | | 1.54 | | |

**Table (5)** show the opinions of hearing impaired teachers that agree on the presence of problems and challenges facing the hearing impaired in the local environment by 60% and the number of responses exceeding 30 responses, with a general average (1.54) and standard deviation (0.203). Also, the responses of dealing with the hearing impaired category was "not easy" in 68% of the teacher and talking to them loudly and repeatedly causes them stress 74%.

## Discussion

The purpose of the present study is to determine the effect of hearing loss on child behaviors and communication. The questionnaire was filled by parents with **38.2%,** while teachers were **61.8% .** A major problem facing those with hearing impairment is the effect on speech, where the percentage of those who had difficulty speaking and talking was **65.85**%. Another effect of hearing impairment which was shown in the present study is behavior by mean (1.79) and communication by problems that effect (65%) of the studied children. This can have deleterious effect on academic achievement as well as psychological wellbeing.

**level of hearing loss**

The levels of hearing loss were severe to profound by **30.1 _30.7%.(table 2)** Most of them were diagnosed with a disability less than **3**years old, (because this age

the child begins to communicate with others, speak and start talking). These results are consistent with study of [6].The percentage of children with severe hearing loss reached 67%[2].,*Babaroglu* said that aggressiveness varies depending on age and level hearing impairment and children with profound (81 db) hearing impairment show more aggressive behaviors at older ages (10-15 age) compared to normal hearing children.

**Behavioral effect**

**(Table 3)** showed the parents / teachers' opinions on the behavioral questionnaire for the hearing impaired children. **SDQ** contains sub-scale from 5 parts which are problems ***(behavioral, emotional, hyperactivity, peer relationship, social behavior***). Each part of these problems contains 5 points that assess if the child has any of these symptoms or not. In the present study the participants agreed on the presence of emotional symptoms in the behavior of children with hearing impairment with an average of **(1.81)**, and slight increased hyperactivity with an average of **(1.77).** Behavioral problems and aggression with the peers was highest found with average **(1.82),** the first four axes represent the negative behavior in the child's personality. In the **Fifth** part of the questionnaire the participants agreed on the existence of positive personal social behavior with an average (**1.75)** and a standard deviation (0.426).

**communication effect**

**(Table 4)** show that HI affects the relationship of majority students with peers and affects communication (**80)** responses with a general average of (**1.60**). This means that hearing impairment has effects on the relationship and communication with others and the surrounding environment, leading to constriction in social relationships with others and makes children more isolated(65%).The majority of children avoid communicate with peers because mocked him due to he had hearing loss and felt embarrassed about the hearing aids , which makes him avoid the gatherings of children by responding (**62%)** of the whole population sample, and difficulty communication with others when crowded environment rate **65%** .This finding is consistent with a study [3]. which documented communication problems in noisy setting such as family setting room or classrooms.

**Teachers' perspectives and challenges facing them.**

**(Table 5) showed** 65% of the teachers are not graduates of special education and this means that not all teachers have sufficient experience to deal with the hearing impaired group in a correct routs. Seventy four percent of the teachers (74%) need to speak loudly repeatedly which result stress. It was found that the vast majority of teachers support conducting training courses in this field for them in order to deal with the hearing impaired in a correct scientific manner, and the response is **86%,** with mean of 1.36 , they also support the presence of a speech therapist in every center and school, with mean 1.70 and percentage 70%.The teachers do not see progress in the field of special education in the city of Mosul.The majority of teachers do not support teaching the hearing impaired the "sign language»)**64%(**may be explained by the fact that the hearing impaired child who have hearing residue will use the sign language as an easier and faster.

## Conclusions

The majority of hearing impaired children have congenital cause for their hearing loss. Idiopathic cause have next and less common cause is otitis media. Behavior problems appear more common in children with hearing loss,the results of the current study showed an increase in behavioral problems among the hearing impaired and this problems limits their relationship with others. So the results of the study showed the opinions of teachers about centers and schools for the hearing impaired in the city of Mosul.

**Acknowledgment:** I thank the children who participated in this study, the teachers and the parents. And big thanks to the supervisors of *Dr. Rabei M. Aldobooni.*

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding**: Self-funding

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# Molecular Identification of Pathogenic *Klebsiella Pneumoniae* Strains Producing Biofilm

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## Abstract

*Klebsiella pneumoniae* is an opportunistic pathogen causing nosocomial infections with production of biofilm. In the current study, 73 samples were collected from both patient genders of different ages suffering of burn and wound injuries that referred to four hospitals in Baghdad city from Aug. to Nov. 2019. The samples were cultured on MacConkey agar and 60 bacterial isolates were obtained. Primary identification by cultural and microscopic examinations declared that all isolates belong to genus *Klebsiella.* Then the 60 isolates were identified by Vitek 2 system which insured they were belonged to *Klebsiella pneumoniae.* The identified isolates were screened for ability to produce biofilm by Microtiter Plate technique and Congo red agar method. Results showed that only 4 isolates (3 of wounds and 1of burns) were able to form biofilms. Upon such important characteristic, the four isolates were submitted to the *16S rRNA* gene amplification test by using PCR technique and results declared that they are certainly belong to Klebsiella *pneumoniae*. The "National Center for Biotechnology Information (NCBI)" verified and documented that they are new strains of *Klebsiella pneumoniae* to be discovered in this study for the first time and registered them as; KPWIQ25, KPWIQ49, KPWIQ51 and KPBIQ19 strains of *Klebsiella pneumoniae*.

***Keywords**: 16S rRNA, sequences, PCR, Strains, Biofilm, health; pathogen.*

## Introduction

In hospitalized patients, *K. pneumoniae* is a frequent reason of antibacterial-resistant opportunistic infections. Naturally, it is resistant to multiple antimicrobials; serious clinical concerns have stimulated the interest in *K. pneumoniae* research and especially the application of genomics [(1)]. *K. pneumoniae* bacterium is a Gram-negative pathogen that has the capability to form biofilms, Microorganism living in a biofilm sometimes have completely different properties from free-floating (planktonic) microorganism of identical species, as has been shown by completely different approaches [(2)], together with microarray analysis studies representing one of the main causes in hospital infections [(3)]. *K. pneumoniae* is a member of such clinically considerable organisms that have obtained much public health apprehension. It is a significant *Enterobacteriaceae* behold as one of the opportunistic bacteria causing wide series of infections and rendering increasingly recurrent acquisition of antibiotics resistance [(4)]. This microorganism accounts about one-third of whole Gram-negative infections like surgical wound infections, pneumonia, infections to the urinary tract, cystitis, endocarditis in addition to septicemia [(5)].

Among hospitalized individuals, *K. pneumoniae* leads to significant morbidity and mortality universally. The pathogenesis principle mechanism in hospital environments relates biofilms formation, foremost on implanted medical equipment's [(6)]. Biofilm arrangement bears a few stages to make a develop biofilm, which concede essential connection

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to the surface, microfilm development, mushroom shape development of biofilm, and discharging motile microscopic organisms inside separation organize [7].

Due to the importance and wide spread of burn and wound infections caused by *K. pneumoniae* and the limitation studies on new strains of this bacterium, the current study was planned for the aim of searching and identification of a new pathogenic strains of *K. pneumoniae* which are able to form biofilms.

## Materials and Methods

Samples collection

A gross of 73 samples were obtained from patients of several ages and both genders suffering from burn and wound injuries who referred to Baghdad Teaching Hospital, Ghazi Al-Hariri Hospital for Surgery Specialist, Specialty Burn Hospital and Al-Kindy Teaching Hospital in Baghdad city from Aug.to Nov. 2019. The samples were taken by sterile disposable cotton swabs and kept in Brain-Heart Infusion broth (Himedia, India) before culturing on MacConkey agar (Mast group, UK) and incubated at 37°C for 24h.

### Isolation and primary identification of bacteria

Colonies from bacterial cultures were described for their morphological properties including shape, size, color, texture…etc. [8]. Then, a touch from a colony was smeared and stained by Gram method to observe cells under the microscope for their Gram reaction, shape, arrangement [9].

### Identification of *K. pneumoniae* isolates by VITEK 2 system

The VITEK 2 (bioMérieux, France) system is a computerized microbiology program using growth-based technology. The suspension of **b**acteria was arranged depending on the recommendations of manufacturers. From overnight pure culture, a sufficient number of colonies were transferred and suspending in sterile saline (3.0 ml) into polystyrene test tube. By using the DensiChek meter, turbidity was regulated to 0.5 McFarland. Later, the same suspension was applied in GN-ID (bioMérieux, France) with VITEK 2 system. Finally, cassette of GN-ID was loaded to the VITEK 2 chamber jointly with the tubes of specimen suspension [10].

### Detection of *Klebsiella pneumoniae* biofilm

### By Microtiter Plate (MtP) method

Microtiter Plate is a quantitative assay used to deduct biofilms through the microplate reader. In the method, each of the bacterial isolates was grown on MacConkey agar (Mast group, UK) at 37°C for 24h. After incubation, part of a grown colony was suspended in physiological solution, then concentration of all isolate suspensions were equilibrated with 0.5 McFarland. A portion (180 µl) of Mueller-Hinton (MH) broth enriched with 1% glucose was put in each of the 96 wells, and then, 20 µl of bacterial suspension was added to it. The microtiter plate was incubated at 37°C for three periods (24, 48 and 72h).

The isolates of which their biofilms formed on the walls of microplate wells were stained with crystal violet for 15 min (Afco, Jordan). Cells not forming biofilms in the wells were discharged by washing twice with phosphate-buffered saline (Euroclone, Italy) and wells were dried at 60°C for 1h. After drying, dye of biofilms that lined the walls of the microplate was resolubilized by of 96% ethanol (ROMIL pure chemistry, UK) and then microplate was spectrophotometrically measured at 570nm by using GloMax Explorer Microplate Reader (Promega Corporation, USA).

The non-inoculated wells containing sterile MH broth augmented with 1% glucose were used as blanks (negative controls). Absorbance values of the blanks were used to detect if isolates form biofilms or not [11].

### By Congo red agar (CRA) method

Congo red agar assay is a qualitative method for screening of biofilm producing microorganisms which depends on colonies color change grown on CRA medium. This medium was prepared by dissolving 0.8g Congo red (Alfa Aesar, USA), 36g sucrose (Oxoid, UK) and 37g Brain-heart infusion (Himedia, India) agar in D.W. then the volume was completed to 1L by D.W. The medium was inoculated the isolate culture and incubated for 24h at 37°C. After incubation, black colonies are considered as biofilm formers while pink ones are non-biofilm producers [11].

**Identification of *K. pneumoniae* by 16S rRNA analysis:** [12]

(All materials of this analysis were from Promega, USA).

**Extraction of bacterial DNA**

The pure colonies were re-suspended completely in 200µl of Buffer CL, and 20µl of Proteinase K solution (20 mg/ml) was added before adding to the cell pellets. The tube was mixed by vortex and incubated first at 56˚C for 30min and second at 70˚C for same time. After incubation, 200µl of Buffer BL was added to the sample and mixed vigorously before incubation at 70˚C for 30 min. After that, 200µl of absolute ethanol was added, and mix thoroughly. All mixtures were transferred to the mini-column, centrifuged for 1 min at 6,000 x g and the collection tube was replaced by a new one. Then, 600µl of Buffer BW was inserted to the mini-column, centrifuged for 1 min at 6,000 x g and the collection tube was replaced with a new one again. A portion of 700µl Buffer TW was centrifuged for 1 min at 6,000 x g. The pass-through was discarded and the mini-column was reinserted back into the collection tube. The mini-column was centrifuged at 13,000 x g, the mini-column was placed into a fresh tube and 100µl Buffer AE was added before incubation for 1 min at room temp. Finally, it was centrifuge at 5,000 rpm for 5min.

**Quantitation of DNA**

Quantus Florometer was used to detect the fineness of isolates for downstream applications. For DNA (1 µl), diluted Quantiflor (199 µl) Dye was prepared. DNA concentration values were inspected after five minutes of incubation within an ordinary room environment.

**Agarose Gel Electrophoresis:**

The presence of amplification was confirmed, agarose gel electrophoresis was adopted after Poly Chain Reaction (PCR) amplification.

**a) Solutions:** DNA ladder marker, 1XTAE buffer, and 10mg/ml Ethidium bromide.

**b) Agarose preparation:** In a beaker, 100 ml of 1X TAE was taken, 1 gm agarose was mixed with the buffer, then all particles of the gel were dissolved by boiling the solution in the Microwave. Then, 1µl of Ethidium Bromide was mixed with the agarose and mixed by the blender. The solution was cooled down to 50 °C

**c) The horizontal agarose gel casting:** After both edges were fixed, agarose solution was flipped into the gel plate with tapes of cellophane and the agarose was solidified at room temperature for 30min. The barrier was gently expelled and the gel arranged in the plate. When the buffer reached 4 mm atop the gel surface, the platter was loaded with 1X TAE-electrophoresis buffer.

**d) Mixture of reaction:** The 25µl mixture of PCR amplification consists of; (12.5 µl Master mix, 2 µl DNA template, 1 µl forward primer, 1 µl reverse primer and 8.5 µl nuclease free water). The protocol of PCR started with initial denaturation at 95°C for 5 min, denaturation at 95°C for 30 sec., annealing at 60 °C for 40 sec., extension 72 °C for 1 min. and final extension at 72 °C for 7min (fig. 1).

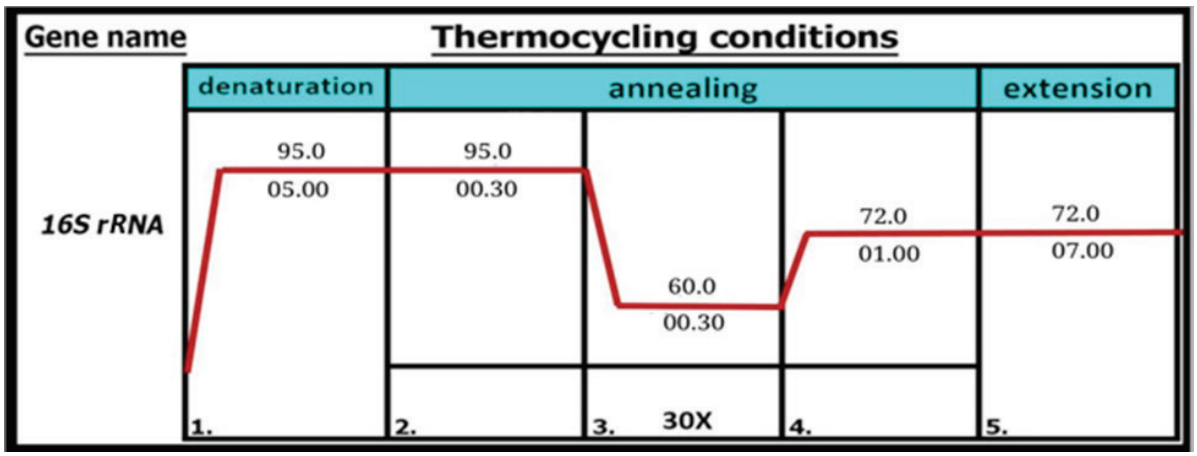


**Figure: (1): Thermocycling conditions diagram of PCR monitor for primer.**

**e) Loading of DNA:** Products of PCR were stacked. For Poly Chain Reaction item, 10µl was padded to well. For 75min electrical power was switched on at 100v/ mAmp. Towards plus Anode poles, DNA moved from Cathode. Investing Gel imaging system stained bands of the Ethidium bromide in gel were visualized.

**Standard Sequencing**

Automated DNA sequences and the product of PCR were sent for Sanger sequencing by Macrogen Corporation/ South Korea using ABI3730XL. The results obtained are shown in table 1. Afterward, it was analyzed depending on genius software and registered by the National Center for Biotechnology Information (NCBI).

**Table (1): Names and sequences of primers.**

| Name of primer | Sequences | Annealing Temp. °C) | Product size bp) | Ref. |
|---|---|---|---|---|
| 27F | 5`-AGAGTTTGATCCTGGCTCAG-3` | 60 | 1500 | (Hashim and AlKhafaji, 2018) |
| 1492R | 5`-TACGGTTACCTTGTTACGACTT-3` | | | |

## Statistical Analysis

Figures were drawn by Graph pad prism version 8 (Graph pad software Inc., La Jolla, CA, USA). Calculations and determination of forming biofilm, means and negative control standard deviation has been done according to [11] by using Microsoft Excel program.

## Results and Discussion

**Isolation and primary identification of bacteria**

From a total of 73 clinical swab samples, 42 were obtained from patients suffering of wound and 31 of burn injuries. After grown on MacConkey agar, 60 bacterial isolates were obtained; 36 (60%) from wounds and 24(40%) from burns. Colonies of the isolates appeared as large, round, mucoid and pink in color; such characteristics are similar to those described by [13] for *Klebsiella* spp. Microscopic examination of the suspected *Klebsiella* isolates revealed that they were Gram-negative short rods according to [9].

**Identification of *K. pneumoniae* by VITEK 2 system:**

By using VITEK 2 system, all the 60 bacterial isolates were identified as *Klebsiella pneumoniae* with a probability of 99%.

**Biofilms produced by *Klebsiella pneumoniae*:**

The results of Microtiter plate (MtP) for biofilm production by *Klebsiella pneumoniae* are shown in fig. (2). After incubation, only 4 isolates, 3 from wounds (symbolled K25, K49 and K51) and 1 from burns (symbolled K19) were able to form biofilms. Among these, K25 isolate was the strongest biofilm producer when its optical density reached 2.67. Adversely, isolate K49 was the weakest biofilm producer with an optical density of only 0.61.

**Figure (2): Optical densities of biofilms produced by *Klebsiella pneumoniae* isolates obtained from wound and burn infections**

**by using Microtiter plate method.**

After that, the Congo red agar assay was applied for qualitative evaluation of pathogenic biofilm. After incubation of *K. pneumoniae* isolates on the medium at 37 °C for 24 h, results illustrated in fig. (3A) showed that only the four biofilm-producing *K. pneumoniae* strains was able to turn color of the medium to black, while others (the non-biofilm producing isolates) were unable to change the red color of medium (fig. 3B). All isolates were let to grow for extended periods of incubation (48 and 72 h) and also found that they were unable to produce biofilms.

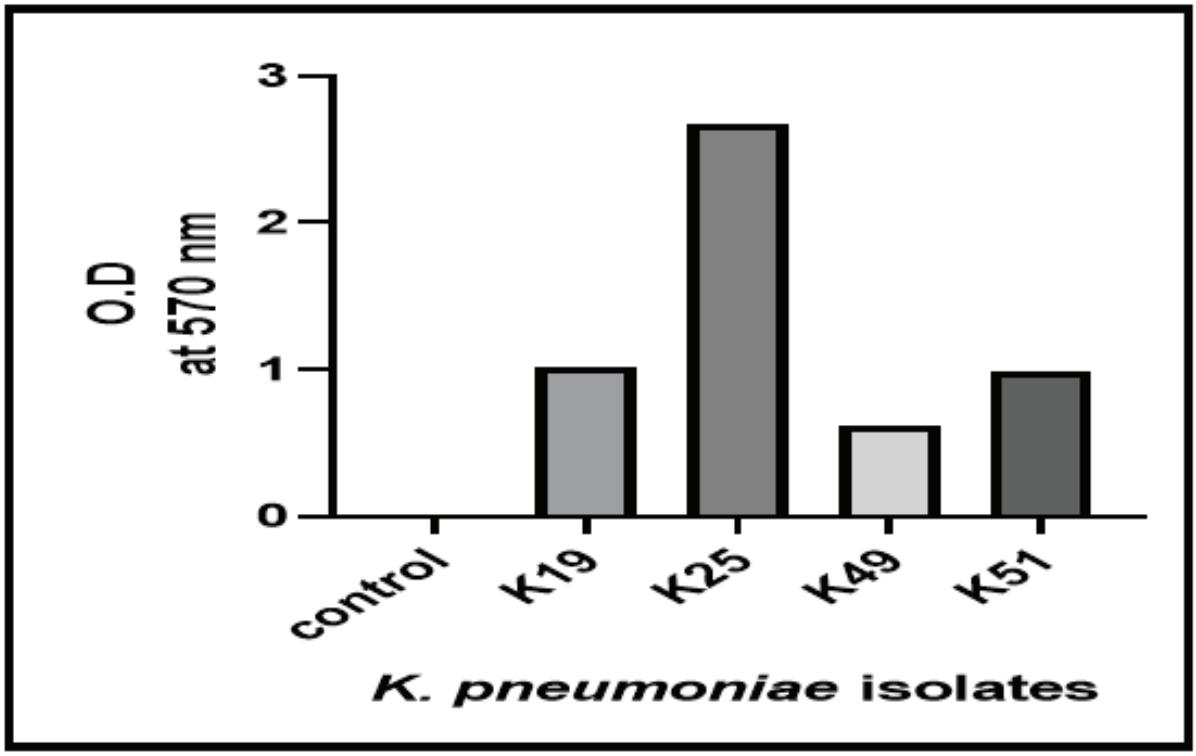


**Figure (3): *Klebsiella pneumoniae* isolates after incubation on Congo red agar at 37 °C for 24 hrs. A: growth of isolate given positive result for biofilm production, and B: growth of non-biofilm producing isolate.**

Results of [14] showed that most of the *Klebsiella* spp isolates collected from numerous clinical centers in Baghdad Province had potency to attach on the smooth surface (glass as well as plastic surfaces) but in various grades and different levels of producing biofilm by using microtiter plate method. However, a trial by [15] found that there is a relationship between color of the colonies and the strength of biofilm foundation; in which dark black reveals heavy biofilm formation, while red colonies declared the absence of biofilm production; they described the Congo red agar as specified method to characterize biofilm-forming bacteria morphologically.

**Identification and registration of new strains of *Klebsiella pneumoniae***

Depending on the 16S rRNA-based molecular identification of clinical isolates and to confirm the identification of *Klebsiella* spp to subspecies level, the amplification of *16S rRNA* gene was conducted by using PCR technique to detect the positive result, 4 new strains of *Klebsiella pneumoniae* namely (KPBIQ19, KPWIQ25, KPWIQ49 and KPWIQ51) were obtained from Iraqi burn and wound patients have been detected and registered in The National Center for Biotechnology Information (NCBI) as written within (table 2).

**Table (2): Gene bank locus registered by the "National Center for Biotechnology Information (NCBI)" based on 16S rRNA molecular identification for the new strains of *Klebsiella pneumoniae* isolated from Iraqi patients suffering burns and wounds.**

| Strain symbol | Gene bank locus | Source of strain |
|---|---|---|
| KPBIQ19 | MT102627 | burn |
| KPWIQ25 | MT102629 | wound |
| KPWIQ49 | MT102630 | wound |
| KPWIQ51 | MT102634 | wound |

In this study the molecular technique were used to confirm the identification of *Klebsiella pneumoniae* strains. where, also [16] performed sequence analysis by using the National Center for Biotechnology Information (NCBI) blast tool and searched in sequences of the Gene Bank database for comparison to identify the *K. pneumoniae* strain (symbolled SRP2), isolated from paper mill waste, Canada.

## Conclusions

After screening all isolates for biofilm production, only four of them were able to form biofilm. The four biofilm producers were discovered for the first time in this study to be new strains of *K. pneumoniae* and nominated by NCBI as KPBIQ19, KPWIQ25, KPWIQ49 and KPWIQ51 *K. pneumoniae* strains.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest**: Non

**Funding**: Self-funding

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# Molecular Localization of Human Papilloma Viral 16/18 DNA in Adenoctomized Tissues from a group of Iraqi Patients

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## Abstract

**Background:** Low- and high- oncogenic risk human papilloma viral infections have been related to the genesis of a variety of human benign and malignant tumors in the oral cavity and nasopharyngeal tissues. High- risk types of human papilloma virus are now well established as major etiologic factors of head and neck cancers, including tonsillar carcinomas. **Objective:** The current prospective case- control study aimed to unravel the frequency of HPV genotype 16/18 DNA detection rates in the adenoctomized tissues from patients with nasopharyngeal tonsillar adenoid hypertrophy. **Materials and Method:** A sixty (60) nasal as well as nasopharyngeal adenotonsillar tissues obtained from patients with adenoid hypertrophy via adenoctomies were enrolled. Forty (40) adenotonsillar tissues were from patients with adenoid hypertrophy, and (20) normal nasal tissue specimens were obtained from pediatric patients following trimming operations of inferior nasal turbinates' with unremarkable pathological changes (as an apparently healthy control group). A recent version of chromogenic in situ hybridization (CISH) method for HPV detection were performed by using specified DNA probes for DNA of high- risk HPV 16/18 genotypes. **Results:** Among nasopharyngeal adenotonsillar tissues group, 15 out of 40 have revealed positive CISH signals for DNA of HPV 16 / 18 genotype, constituting 35% of the total screened adenoid hypertrophied tissues. No positive–CISH reactions were detected in the control nasal tissues. Statistically, the results obtained in this study showed significant difference when compared to the control tissues group. **Conclusions:** The significant rate of such high- oncogenic HPV genotypes detection in those nasopharyngeal adenotonsillar tissues criticizes searching its further importance, as HPV 16/18 genotypes are critically correlated to many pre- neoplastic as well as malignant lesions.

***Key Words:*** *Adenoid hypertrophy; Nasopharyngeal adenotonsillar tissues; HPV 16/18; CISH.*

## Introduction

Waldeyer's ring consists of submucosal and subepithelial lymphatic tissues localized in the pharynx and comprises the tubal, pharyngeal, palatine, and lingual tonsils. The pharyngeal tonsils, also known as adenoids, located at the posterior superior nasopharynx [(1)].

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Adenoidal hypertrophy is an increase in adenoids size that might be associated with or without an acute or chronic infection[(2)]. An array of viral agent were recognized in association with the etiology of adenoid hypertrophy, such as herpes simplex virus, Epstein-Barr virus, , cytomegalovirus, adenovirus, coronavirus, coxsackie virus,,human boca virus, para influenza virus, rhinovirus, Parvovirus B19, and novel KI and KU polyomaviruses [(3-6).]

Among over 100 different types of Human papillomavirus (HPV) that are capable of infecting skin or stratified epithelial cells, at least 13 are cancer-causing types deemed 'high-risk'; the most common of

these being HPV 16 and 18 The remaining 'low-risk' types, causing non-cancerous lesions, of which HPV 6 and 11 are most common [7]. During the last 2 decades, an increasing evidence has suggested that human papillomaviruses (HPVs) can also infect the tonsillar epithelium,[3,4] and similar to other mucosal sites, have been associated with malignant transformation of tonsillar epithelia[8-10].

Since the incidence of tonsillar SCC has increased, whereas simultaneously the frequency of smokers has declined, additional risk factors probably exist for this malignancy [11,12]. Previous studies have suggested a substantial proportion of tonsillar SCCs to be associated with oncogenic HPV infections(13). The prevalence of HPV-positive related oropharyngeal SCC has been progressively increased and the tonsils were the most commonly affected sites [14] . Of note, >90% revealed HPV 16 [15] . However, to delineate when tonsillar HPV infection is first acquired as well as how long it remains latent, this goal could be approached by evaluating its prevalence in the pediatric population [7].

To our knowledge, this is the first molecular analysis that shade light on the association rate of HPV 16/18 infection in pediatric patients with tonsillar adenoid hypertrophy in Iraq.

## Material and Method

In this prospective case- control study, sixty nasopharyngeal adeno-tonsillar tissue specimens from patients with adenoid hypertrophy have enrolled that including 40 nasopharyngeal adeno-tonsillar tissues from patients with adenoid hypertrophy and other 20 normal nasal tissues (as an apparently healthy control group since have unremarkable pathological changes). CISH detection of HPV 16\18 DNA, a specified four- (4) µm tissue section was tested by a digoxigenin-labeled, oligonucleotide probe to target this HPV 16\18-DNA, via using specific CISH kit ( purchased from Zyto Vision GmbH. Fischkai, Bremerhaven. Germany).

For the statistical analysis, Chi–square test has used to calculate the statistical significance of the studied parameters, and the SPSS-23 package has been performed to analyze the relationship between the variables, where the p value of less than 0.05 points for a significant relationship between the studied parameters.

## Results

**Distribution of patients with nasopharyngeal adenoid hypertrophy according to their Age:**

In this study, the specimens were collected from patients with nasopharyngeal adenoid hypertrophy whom ages were ranging from 4 to 9 years with a mean of 5.77 ± 3.73 years. The mean age of those apparently healthy individuals (A.H. control) was 6.35 ± 5.66 years and their age ranged from 5- 12 years (Table 1) .

**Table (1): Distribution of studied patients with nasopharyngeal adenoid hypertrophy according to the mean and range of their age**

| Studied groups (Age / Year) | N | Mean | Std. Deviation | Std. Error | Range | | ANOVA test (P-value) |
|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | |
| Nasopharyngeal Adenoid Hypertrophy | 40 | 5.77 | 3.73 | 1.11 | 4 | 9 | P=0.4 |
| A.H. Control | 20 | 6.35 | 5.66 | 2.14 | 5 | 12 | |
| Total | 60 | | | | | | |

**Gender distribution of the patients with nasopharyngeal adenoid hypertrophy:**

Males **with nasopharyngeal adenoid hypertrophy** was higher (60%: 24) than their female counter parts (40%: 16) .Also, in the control group , the males were higher (60%: 12) than females (40%: 8 ). The statistical analysis showed significant difference (P<0.01) among the studied groups (Table 2).

**Table (2): Distribution of the studied patients with nasopharyngeal adenoid hypertrophy according to their gender.**

| Gender | | | Studied Groups | | Pearson Chi-Square (P-value) |
|---|---|---|---|---|---|
| | | | Apparently Healthy Control | Nasopharyngeal Adenoid Hypertrophy | |
| | Male | N | 12 | 24 | |
| | | % | 60% | 60% | P=0.007 Sign. (P<0.01) |
| | Female | N | 8 | 16 | |
| | | % | 40% | 40% | |
| Total | | N | 20 | 40 | |

**CISH expression of** Human Papilloma Viral types 16\18 DNA **in nasopharyngeal adenoid hypertrophied tissues**

**I-Positive HPV 16\18 DNA- CISH signal scoring**

The nasopharyngeal adenoid hypertrophied tissues have revealed 35% positive signals which represented 14 out of 40 tissues in this group. None of control tissues group presented positive signals for HPV 16\18-CISH test. The low signal scoring was noticed in (15%) whereas (12.5%) and (7.5%) have moderate and high signals scoring, respectively (detailed in Table 3). However, in comparison to the percentage of HPV 16\18-DNA in healthy control group, the differences are statistically highly significant (P value = < 0.0001).

**Table (3): Distribution of signal scores of HPV 16\18-DNA-CISH reactions.**

| HPV 16\18 scores | | Studied groups | | |
|---|---|---|---|---|
| | | A.H. Control | Nasopharyngeal Adenoid Hypertrophy | P-Value |
| Negative | N | 20 | 26 | |
| | % | 100% | 65% | |
| Positive | N | 0 | 14 | |
| | % | 0.00% | 35% | |
| Low | N | 0 | 6 | |
| | % | 0.00% | 15% | |
| Moderate | N | 0 | 5 | P=0.000 Highly Sign. (P<0.01) |
| | % | 0.00% | 12.5% | |
| High | N | 0 | 3 | |
| | % | 0.00% | 7.5% | |
| Total | N | 20 | 40 | |
| | % | 100% | 100% | |
| | | | | |

**Signal intensity of HPV 16\18- CISH testing:**

Regarding signal intensities of HPV 16\18-CISH signal detection in nasopharyngeal adenoid hypertrophied tissues, the weak signal intensity was noticed in (20 %) whereas (10%) and (5%) have in both moderate and strong intensity, respectively. Statistically, significant differences were recorded between studied groups at (P<0.01) (detailed in Table 4).

**Table (4): Distribution of signal intensities of HPV 16\18-DNA-CISH reactions.**

| HPV 6\11 intensity | | Studied groups | | |
|---|---|---|---|---|
| | | A.H. Control | Nasopharyngeal Adenoid Hypertrophy | P-Value |
| Negative | N | 20 | 26 | P=0.004 Highly Sign. (P<0.01) |
| | % | 100% | 65% | |
| Positive | N | 0 | 14 | |
| | % | 0.00% | 35% | |
| Weak | N | 0 | 8 | |
| | % | 0.00% | 20% | |
| Moderate | N | 0 | 4 | |
| | % | 0.00% | 10% | |
| Strong | N | 0 | 2 | |
| | % | 0.00% | 5% | |
| Total | N | 20 | 40 | |
| | % | 100% | 100% | |
| | | | | |

**Physical state assessment of HPV-16/18 DNA as an integrated and episomal forms**

Regarding episomal and integrated forms of HPV 16\18-CISH signal detection in adenoid hypertrophy tissues group, the episomal was noticed in (28.6 %) whereas (71.4%) have an integrated phase (Table 5).

**Table 5: Integrated and episomal forms of HPV-16/18**

| HPV 16\18 | Positive (No.) | % |
|---|---|---|
| Episomal | 4 | 28.6 |
| Integrated | 10 | 71.4 |

**V. Spearman's Rho statistical testing of age, gender, and HPV 16\18-CISH to evaluate the studied markers in nasopharyngeal adenotonsillar hypertrophied tissues.**

A strong positive relationship (with highly significant correlation) was found between HPV 16\18 and age of patients with nasopharyngeal adenotonsillar hypertrophy (r = 0.248, P = 0.003). However, there are no significant correlation between adenoid hypertrophy and gender ( and as illustrated in table 6).

**Table 6 .Spearman's Rho statistical testing of age, gender, and HPV 16\18-CISH to evaluate the studied markers in nasopharyngeal adenotonsillar tissues.**

| Spearman's rho | | Age groups (years) | Gender | HPV 16\18 |
|---|---|---|---|---|
| Age groups (years) | r | | 0.050 | |
| | P | | 0.898 | |
| Gender | r | | | 0.186 |
| | P | | | 0.342 |
| HPV16\18 | r | 0.248 | | |
| | P | 0.003* | | |

***Correlation is highly significant (P<0.01).**

## Discussion

While tonsillar and/or adenoidal hypertrophy are prevalent otolaryngology disorders in children, their pathogenesis are largely unknown [(16).] Normal tonsillar tissues have been assessed in only a few studies, where by the end of year 2002, 8.5% (17 of 200) of the tonsillitis samples contained HPV DNA, and out of them 12 samples of HPV 16[(1)] . However, the current rate of HPV infection in the tonsillar and adenoid hypertrophied tissues of the pediatric population remains poorly defined [(7).]

In the current study, 14out of 40 nasopharyngeal adenotonsillar tissues have revealed positive CISH signals for DNA of HPV 16 / 18 genotype, constituting 35% of the total screened group of tissues. The detecting of such important HPV 16/18 genotypes in these adenotonsillar tissues criticizes searching their further importance.

Based on a systematic review of the literature by Wojtera et al, [(7)], the range of prevalence of HPV in pediatric tonsillar tissues was 0 - 21%. However, an interesting parallel in the pathogenesis of HPV infection of the cervix, is that persistent and often asymptomatic HPV infection can lead to intraepithelial neoplasia and the eventual accumulation of mutations, resulting in cancerous invasion and metastasis. A similar cycle may occur with tonsillar HPV infection, emphasizing the importance of early detection of HPV[(17).]

Geographical distribution of HPV infection (in general) as well as HPV-related cervical lesions are alternate possibilities for supporting the notion of such variation in the prevalence of pediatric tonsillar- HPV infection [(18,19).]

In the present study, the CISH results of HPV DNA detection showed 15% low scores and 20% weak signal intensity.

In the present, and as all previous studies, the obtained tissues from tonsillar hypertrophy and chronic tonsillitis cases were the indications for tonsillectomies. The current findings support these authors that such subclinical HPV infections detected in childhood may represent a pre-malignant lesion with a long-term course, and as well as a risk factor for the development of tonsillar cancer in adulthood.

Of value in this respect to note that, up to 2003, a total world literature has reported presence of HPV DNA in 51% of the analyzed tonsillar SCCs via a variety of detection techniques .In addition, the most prevalent HPV type was HPV-16 (84%). Moreover, HPV-33 has been found in only 4.6% whereas HPV types 5, 12, 31, 35, and 59 have been detected in occasional tonsillar carcinomas. However, four studies have enrolled 1941 patients have failed to detect HPV[1].

These contradictable results were suggested to be related to a potential sampling or selection bias since were done on a smaller scale [20,21].

For being RT-qPCR as a gold standard [22], and since the unreliability of conventional PCR (that use broad-spectrum primers for HPV) as well as lack of controls (in some studies), some of the observed high prevalences in majority of the previous studies may be explained [23].

In the present study, the CISH results to analyze the physical state of HPV DNA detection in the tonsillar tissues have showed that 71.4% have an integrated forms while episomal forms constituting 28.6% of the tissues.

Only few studies have systematically analyzed the physical state of HPV in the tonsillar carcinoma(1,24). Interestingly, integration of HPV-18 into the chromosome at 10q24 in tonsillar SCC cases has also been reported [25].

It was also described an episomal forms of HPV-16 as well as integrated or both (the episomal and integrated) forms of HPV 33- positive tonsillar carcinomas[8]. One possible explanation, for being HPV is mostly in the episomal form in tonsillar carcinomas, could be a genetic alteration in the long control region of extra chromosomal HPV, that leads to dysregulation of the viral oncogenes[1].

It was also reported an episomal (but deleted) HPV-16 in tonsillar carcinomas, where the biological implications of such deletions remained obscure [8]. The pathogenesis of HPV- induced tonsillar carcinoma is different from cervical carcinoma, where HPV is mostly in the cervical carcinoma of an integrated form [1]. Whether these pediatric HPV 16 /18 infections are representing a transient and eventually eliminated by the host's immune system, or remains as a latently viral status, or eventually progresses to symptomatic disease, pre-malignancy states and ultimately lead to a malignant lesions is currently unknown and to be determined, too.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding**: Self-funding

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# Roles of Brain-Derived Neurotrophic Factor (BDNF) In Developing Jaw

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## Abstract

Brain-derived neurotrophic factor (BDNF) recognized to be involved in differentiation and proliferation of specialized cell such as osteoblast cell and endothelial cell. The study designed to identify the effect of exogenous BDNF on development of jaw and on neural marker expression.

Twenty pregnant rats, ten rats injected (I.M) with 0.1 ml normal saline, other ten injected (I.M) with 0.1 ml of BDNF. Rats were received three doses at intervals (0, 7, 14 day of gestation periods).The developmental jaw of embryos in 16th and 18th intra-uterine life studied for histological and immune-histochemical investigations.

The results Illustrated an enhancement of bone development during proceeding embryonic periods for both study groups .Moreover, the experimental group showed a significant differences in the mean of bone cell count at 18th day in comparison to 16th day IUL, and in comparison to control. Results revealed a positive expression of neuronal marker by proliferating nerve cells with a significant difference in comparison between experimental and control. The study suggests that BDNF may contributed in promoting the differentiation of bone cells and enhancement of bone formation with increasing in expression of neuron marker.

***Key words:*** *Brain derived neurotrophic factor, bone, embryogenesis, osteogenic cell, bone stem cell*

## Introduction

Neurotrophins and their receptors are important molecules that have a role in the development and maintenance of nervous organs and involved in regulating of organogenesis of skeletal tissues[1,2] . Studies have shown that neurotrophins are widely expressed in skeletal tissues, and shared in chondrogenesis, osteoblastogenesis, and osteoclastogenesis[3,4] .They illustrated to be involved in regulating skeletal tissue formation and in healing events[5] .Moreover ,BDNF stimulates and controls growth of new neurons from neural stem cells (neurogenesis)[6,7] and BDNF protein and mRNA have been identified in most neural areas of developing tissues[8,9] .

This study used Brain-derived neurotrophic factor (BDNF) to investigate its potential roles on expression of neural marker in developing bone of prenatal rat jaw.

## Materials and Methodology

Twenty female Albino Wister rats with age range of 4-5 months ,weighted 250-270g have been enrolled in this study and according to ethical approval from the ethical committee of the Al-Mustaqbal University College (license No: 069222) authorized all of the experimental approaches. Rats were first isolated from the rest, for two weeks to exclude any previous pregnancy. After examination and confirmation of non- pregnancy by the resident veterinary doctor, each female paired with a male in a separate cage and checked daily for the presence of vaginal plug. Then

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the pregnant rats maintained in the animal department of (National Center of Drug Control and research / Iraq) under control conditions of temperature, drinking and food consumption. All experimental procedures carried out according to the ethical principles of animal experimentation. The pregnant rats divided randomly into 2 groups, each consisting of 10 animals.

Group I (control group) received 0.1 ml normal saline by intramuscular injection

Group II (experimental group) received 0.1 ml BDNF (ab9794)/ Abcam (intramuscular injection).Both groups received three doses at gestation interval periods (0, 7, 14 day).

Five rats from each group sacrificed at 16$^{th}$ and 18$^{th}$ day of gestation date and their embryo heads used for histological and immune-histochemical investigation.

**Histological examination**

Embryo jaw resected, fixed in 10% buffered formalin, dehydrated, and embedded in paraffin wax. Then section (5µm) stained with Hematoxylin and Eosin (H&E). The histological examination done under light microscope by examining four microscopical fields for each slide. Mean readings of counting number of the bone mesenchymal stem *cells* (BMSCs), osteocytes, and osteoblast were calculated and used in statistical analysis.

**Immunohistochemistry investigation on tissue sections**

The Neuronal Marker (ab104224) from Abcam used and according to manufacture data sheets, the preparation and characterization of this monoclonal antibody described. Positive peroxidase staining produces brown color on light microscopy; the percentages of positively stained cells counted at five representative fields (40X). Quantification method for Immuno-response estimated for the positive cell that expressed neuronal Marker and assessed by identifying and scoring 100 cells in five fields, X40 of the examined area. The scoring is (Score 0, none; score 1, <10%; score 2, 10-50%; score 3, 51-80%; score 4, >80% )[10].

**Radiological examination**

All embryo's head radiographed by Plain X-ray before resection with standard dental radiographic film. Voltage(kV)=60, Current(mA)=70, Exposure(s)=0.08.

## Statistical Analysis

The data analyzed by using Statistical methods using SPSS software program (version 19) and including:

A. Descriptive statistics

1. Means 2. Std Dev.3. Std error 4.Min.&Max.

B. One-way ANOVA test with multiple comparisons by (LSD Method).

## Results

**1. Histological and immune-histochemical Findings**

Control group at 16$^{th}$ IUL showed new apposition of thin trabeculae surrounding by proliferating bone stem cells, and at 18$^{th}$ day, histologic section showed bone trabeculae with osteoblast on the surface.

Immuno-histochemical expression of neuronal marker for embryonic bone (control& exp.) at 16$^{th}$ & 18$^{th}$ IUL have showed a positive DAB stain by proliferating neural cells in developing jaw, and recorded score 1 for control and score 2 with intense immune reaction for the experimental.

Experimental group at 16$^{th}$ IUL showed bone trabeculae with osteoblast, and proliferating bone stem cell detected around the trabeculae. At 18$^{th}$ day of gestation period, histological views illustrated well, thick organized trabeculae surrounding by osteoblast and osteocyte cell trapped inside the trabeculae. Figure (1)

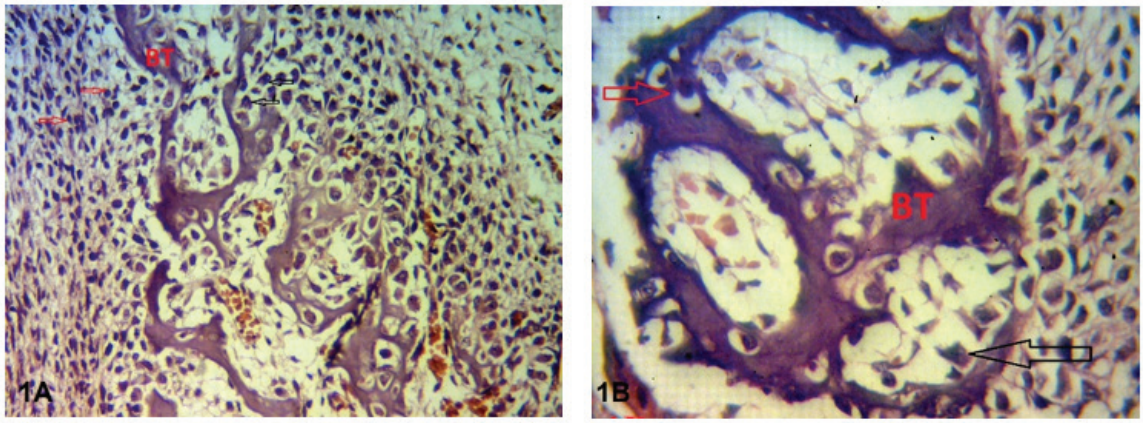


**Figure (1) embryonic bone at 18th IUL for control and experimental groups "1A: Control shows bone trabeculae (BT), bone mesenchymal stem cell.(arrows).H&Ex20 ; 1B: Experimental shows bone trabeculae (BT); osteocyte (red arrow) osteoblast (black arrow) H&Ex40"**

### 2. Radiological results

Radiographic evaluation for the study groups of embryos at 18th IUL illustrated that control group showed faint and streaky radio-opacity in upper and lower jaws, while experimental group has recognized more organized, linear radio-opacity in upper and lower jaws. Figure (2)

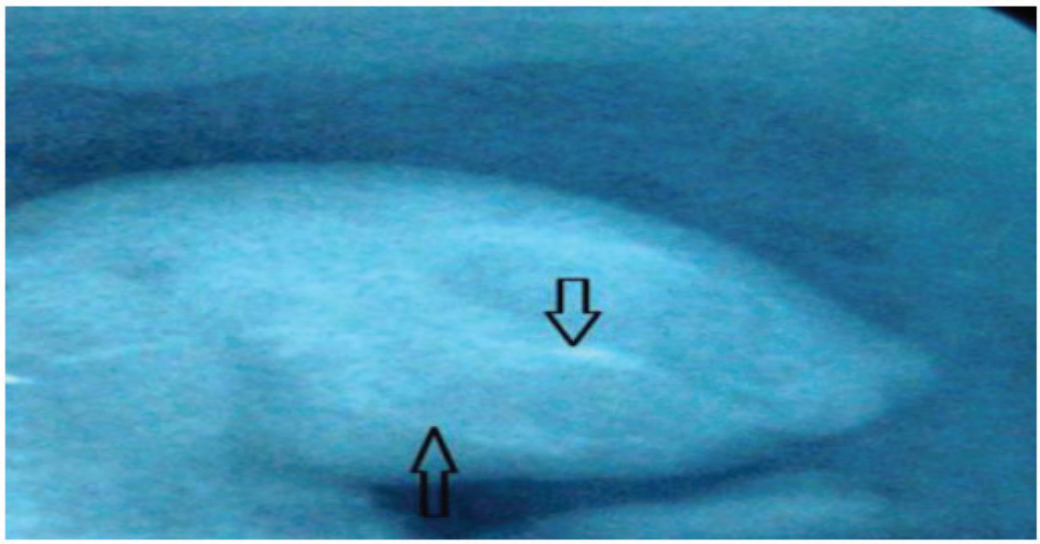

**Figure (2) Linear opaque radio-density represents development of upper and lower jaw (arrows) for Experimental group at 18th IUL**

## Statistical Analysis

Tables (1&2) illustrate the mean of bone cell (osteoblast and osteocyte) with bone mesenchymal stem cells (BMSC) for control and experimental groups at the16th and 18th gestation periods. Multiple comparisons by (LSD Method) of bone cells and BMSC count showed a significant value for the experimental group at the period 18th day in comparison to 16th day IUL, and in comparison to control at 18th day IUL .

Table(3) illustrates mean of neuron cells that expressed positive neuron marker .The results showed a high record in the mean of positive cells in experimental for both periods in comparison to control with a

significant difference value. On other hand, mean of positive cells in experimental group showed to be high at period 16th in comparison to 18th period, moreover, reversed results in control observed.

**Table (1): Statistic analysis with multiple comparisons by (LSD Method) among all pairs of different (S.O.V.) effect's Parameters in compact form, for the bone cells count Parameter in studied trials.**

| Groups/ Bone cells /periods | Sample No. | Mean | Std. Dev. | Std. Error | 95% C. I. for Mean L.bound | Up.bound | Min. | Max. | |
|---|---|---|---|---|---|---|---|---|---|
| Control - Osteoblast - 16th IUL | 10 | 8.97 | 1.03 | 0.42 | 6.58 | 10.75 | 6 | 11 | |
| Control - Osteoblast 18th IUL | 10 | 14.00 | 1.10 | 0.45 | 11.79 | 15.15 | 12 | 16 | |
| Control - Osteocyte -16th IUL | 10 | 4.67 | 1.88 | 1.58 | 3.59 | 5.74 | 3 | 6 | |
| Control - Osteocyte - 18th IUL | 10 | 8.87 | 2.07 | 0.84 | 6.50 | 10.83 | 7 | 12 | |
| Control - BMSCs 16th IUL | 10 | 28 | 0.63 | 0.26 | 27.1 | 29.6 | 26 | 29 | |
| Control - BMSCst - 18th IUL | 10 | 22 | 0.55 | 0.22 | 21.3 | 23.3 | 18 | 24 | |
| Exp-Osteoblast - 16th IUL | 10 | 10.70 | 1.64 | 0.67 | 9.78 | 11.22 | 9 | 12 | |
| Exp-Osteoblast -18th IUL | 10 | 26.88 | 0.75 | 0.31 | 24.04 | 27.62 | 24 | 28 | |
| Exp-Osteocyte - 16th IUL | 10 | 8.00 | 0.89 | 0.37 | 7.06 | 9.94 | 6 | 10 | |
| Exp-Osteocyte - 18th IUL | 10 | 12.89 | 1.83 | 0.75 | 10.91 | 13.76 | 10 | 14 | |
| Exp.-BMSCs-16th IUL | 10 | 24 | 0.52 | 0.21 | 22 | 25.4 | 20 | 26 | |
| Exp.- BMSCs - 18th IUL | 10 | 20.5 | 0.75 | 0.31 | 19.6 | 21.7 | 19 | 22 | |

**Table (2): Multiple comparisons by (LSD Method) among all pairs of different (S.O.V.) effects of Density Parameter in compact form for bone cells count**

| Groups | periods | Mean Difference | Sig.(*) | C.S. |
|---|---|---|---|---|
| Control /Exp. | 16th IUL | 0.14 | 0.655 | NS |
| Control/ Exp. | 18th IUL | 0.67 | 0.007 | HS |
| Control | 16th / 18h IUL | 0.16 | 0.522 | NS |
| Exp. | 16th / 18th IUL | 0.71 | 0.0001 | HS |

**Non Sig. at P> 0.0**

**Table (3): Multiple comparisons by (LSD Method) among all pairs of different (S.O.V.) effects of Density Parameter in compact form for positive expression of neuron marker**

| Groups | periods | Mean of +ve cell | Mean Difference | Sig.(*) | C.S. |
|---|---|---|---|---|---|
| Control /Exp. | 16th IUL | 7.33/ 12.44 | 0.16 | 0.000 | HS |
| Control/ Exp | 18th IUL | 9.34/8.67 | 0.43 | 0.011 | S |
| Control | 16th / 18h IUL | 7.33/9.34 | 0.22 | 0.000 | HS |
| Exp. | 16th / 18th IUL | 12.44/ 8.67 | 0.41 | 0.000 | HS |

**Non Sig. at P> 0.0**

## Discussion

The study focused on jaw development of rat model and confirmed how the use of brain-derived neurotrophic factor can affect formation and aggravation of bone. However, the effect of BDNF in bone development reconsolidation has been less studied.

A studies found that neurotrophins and their receptors expressed in mouse osteoblastic cell lines[11,12] .The present study shows that using of exogenous BDNF plays a role in development of the jaw as the results confirmed by histological and immune-histochemical investigations and by radiologic examination . The results show that the mean of the number of bone cell (osteoblast and osteocyte) with bone mesenchymal stem cells for experimental group are higher in comparison to control [13,14] .In addition, increment of expression of neuronal marker by the proliferative mesenchymal stem cell and formative bone cell enhanced bone formation [15,16] .

Furthermore, in experimental group, we observed that new bone trabeculae formation started at 16$^{th}$ day proceeding the control group with a coincidence of an increment for expression in neuron marker. At 18$^{th}$ day of gestation period a well, thick organized trabeculae surrounding by osteoblast with presence of osteocyte detected histologically .Moreover, the result confirmed radiologically as the radiographic view showed a linear opaque radio-dense demarcated the jaw.

The results could explained as following: BDNF is a key molecule that controls neuronal differentiation, survival and synaptic formation[17] which helped in differentiation of bone cells, and enhanced neuron expression as revealed in this study.

## Conclusion

Brain-derived neurotrophic factor (BDNF) has neurological and non-neurological effect on bone formation by increasing expression of neuronal marker with increment of the number of bone progenitor cells and bone forming cells.

**Acknowledgment:** This work was supported by Prof. Dr. Hasan Majdi, Dean of Al-Mustaqbal University College, Babylon, Iraq

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding**: Self-funding

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# Serum and Salivary Immunoglobulins levels in Tobacco Smokers of Baghdad Governorate

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## Abstract

It was shown that tobacco smoking was a major environmental factor which altered numerous changes in both antibody and cell mediated immune responses leading to increase the capability of the individual to develop various inflammatory and autoimmune diseases, thus the current study aimed to assess the levels of both serum and salivary Igs in 35 individuals who smoking tobacco and compared them to 35 non-smokers group. Results of this study revealed a slightly but non-significant increased ($p<0.05$) in the serum and salivary levels of IgM in smokers as compared to non-smokers, while the serum and salivary levels of both IgG and IgA shown a significantly decreased ($p\leq0.05$) in smokers as compared to non-smokers group. No positive correlation was found in the serum and salivary Igs levels in smokers. Body mass index (BMI) and smoking index (SI) were calculated for the smokers group, however, no significant differences were found in both serum and salivary Igs levels.

***Keywords:*** *Health, Smoking, Immunoglobulins (IgM, IgG and IgA); toxicity*

## Introduction

Tobacco smoking is one of the worldwide epidemic habits that associated with human beings death and morbidity[1] .Various chronic diseases in the brain, respiratory tract and cardiovascular system are induced because of the antigenic, carcinogenic and mutagenic impacts of the toxic chemical compounds which found in tobacco[2]. The World Health Organization (WHO) expected that in 2030 tobacco smoking will be one of the main causes that lead to the death of about 8 million individuals especially in the developing countries[3]. According to Hussain and Sullivan study in Iraq, about 29-31% males and 3-4% females considered as active smokers[4]. Inhalation of tobacco smoking has many adverse effects on both humeral and cellular immune response, it implicated in the inhibition or the production of many pro-inflammatory and anti-inflammatory cytokines in human body[5]. Many studies confirmed that tobacco smoking has prospective effects on inflammation process and autoimmunity such as Chronic Obstructive Pulmonary Disease (COPD), Rheumatoid Arthritis (RA) and Systemic Lupus Erythematosus (SLE)[6].Immunoglobulins (Igs) are glycoproteins found in serum, tissues and body fluids, synthesized by plasma cells in response to antigenic stimulation[7]. Five classes of Igs have been established which include: IgM: plays an important role in primary immune response, IgG: considers as the main Ig in secondary immune response, IgA: protects the mucosal surfaces from infections, IgE: acts as anti-parasitic and anti-allergenic, IgD: acts as B-cell receptor[8, 9]. Igs that present in saliva play a very important role in oral cavity protection especially salivary IgA which inhibit the entry of infectious microorganisms[10]. The current study aimed to investigate whether there are differences in the serum and salivary Igs levels in tobacco smokers and non-smokers.

## Materials and Method

The present study was carried out on 70 healthy males (with no clinical signs) lived in Bagdad Governorate, 35 individuals were smokers and 35 individuals were non-smokers, their age range from (18-40) years. Body mass index (BMI) was calculated by dividing the body weight (kg) on the square of the body height ($m^2$) in both smokers and non-smokers as the followings:7 smokers and 8 non-smokers had underweight BMI<18.5 kg/$m^2$, 20 smokers and 22 non-smokers had normal BMI (18.5-24.9) kg/$m^2$, 5 smokers and 4 non-smokers had over weight BMI (25- 29.9) kg/$m^2$, while only 3 smokers

and 1 non-smokers had obese BMI >30 kg/$m^2$. Smoking index (SI) for smokers was calculated as the number of cigarettes per day multiplying by the years of smoking as the followings: 30 smokers had mild SI < 200 while only 5 smokers had moderate SI (200-600).Serum samples from both smokers and non-smokers were obtained after centrifugation of blood samples for 5 min. at 3000 rpm, then they were stored at -20C° until use. Unstimulated saliva samples were collected from the study subjects (whom prevented from eating and drinking for nearly 1 hr. prior to donation) after cleaning and rinsing their oral cavity. All saliva samples were centrifuged for 10 min. at 10000 rpm, then the supernatants were stored at -20°C until use. The levels of serum and salivary Igs were measured by using the turbidimetric immunoassay. In order to analyze the data of the current study which were presented as mean ±Standard Error (S.E.), SPSS version 25.0 was used, one way ANOVA test has been dependent to find the differences between means which considered significant when the probability (P) value was ≤ 0.05[11].

## Results

Serum Levels of Igs (IgM, IgG and IgA) in Smokers and Non-Smokers:

Results of the current study revealed that serum level of IgM showed non-significant increase (p>0.05) in smokers as compared to non-smokers, while the serum levels of both IgG and IgA were decreased significantly (p≤0.05) in smokers as compared to non-smokers (Table.1).

**Table.1: Mean Serum Levels of Igs (IgM, IgG and IgA) in the Study Samples.**

| Samples | No. | Mean±S.E. IgM(mg/dl) | Mean±S.E. IgG(mg/dl) | Mean±S.E. IgA(mg/dl) |
|---|---|---|---|---|
| Smokers | 35 | 123.188±5.88a | 1075.76±33.112a | 243.654±11.774a |
| Non-Smokers | 35 | 119.385±2.99a | 1235.58±41.014b | 197.048 ±6.993b |
| *Similar letters=No significant difference (P> 0.05) between means.<br>*Different letters=Significant difference (P≤0.05) between means. | | | | |

Salivary Levels of Igs (IgM, IgG and IgA) in the Study Samples.

According to the levels of Igs in saliva samples, salivary IgM in smokers showed slightly but non-significant increase (p>0.05) as compared to non-smokers; however the levels of salivary IgG and IgA in smokers were decreased significantly (p≤0.05) as compared to non-smokers (Table.2).

**Table.2: Mean Salivary Levels of Igs (IgM, IgG and IgA) in the Study Samples.**

| Samples | No. | Mean±S.E. IgM(mg/dl) | Mean±S.E. IgG(mg/dl) | Mean±S.E. IgA(mg/dl) |
|---|---|---|---|---|
| Smokers | 35 | 0.585±0.01a | 1.869±0.06a | 7.365±0.99a |
| Non-Smokers | 35 | 0.56±0.07a | 4.519±0.13b | 16.05 ±0.56b |
| *Similar letters=No significant difference (P> 0.05) between means.<br>*Different letters=Significant difference (P≤0.05) between means. | | | | |

Correlation between Serum Igs (IgM, IgG and IgA) in the Study Samples.

In smokers, negative correlation was found between serum IgM and IgG levels, no correlation was found between serum IgM and IgA levels as well as between serum IgG and IgA levels. In addition, no correlation was found among serum Igs in non-smokers (Table.3).

**Table.3: Correlation between Serum Igs levels (IgM, IgG and IgA) in the Study Samples.**

| **Serum Igs levels in Smokers** | | **r** | **p** | **Significance** |
|---|---|---|---|---|
| IgM(mg/dl) | IgG(mg/dl) | -0.01 | 0.956 | Non-significant |
| | IgA(mg/dl) | 0.103 | 0.557 | Non-significant |
| IgG(mg/dl) | IgM(mg/dl) | -0.01 | 0.956 | Non-significant |
| | IgA(mg/dl) | 0.03 | 0.864 | Non-significant |
| IgA(mg/dl) | IgM(mg/dl) | 0.103 | 0.557 | Non-significant |
| | IgG(mg/dl) | 0.03 | 0.864 | Non-significant |
| Serum Igs levels in Non-Smokers | | r | p | Significance |
| IgM(mg/dl) | IgG(mg/dl) | 0.299 | 0.081 | Non-significant |
| | IgA(mg/dl) | 0.387 | 0.092 | Non-significant |
| IgG(mg/dl) | IgM(mg/dl) | 0.299 | 0.081 | Non-significant |
| | IgA(mg/dl) | 0.163 | 0.35 | Non-significant |
| IgA(mg/dl) | IgM(mg/dl) | 0.387 | 0.092 | Non-significant |
| | IgG(mg/dl) | 0.163 | 0.35 | Non-significant |

Correlation between Salivary Igs (IgM, IgG and IgA) in the Study Samples.

In smokers, negative correlation was found between salivary IgM and IgG levels as well as between salivary IgM and IgA levels; however no correlation was found between salivary IgG and IgA levels. In addition, in non-smokers negative correlation was found between salivary IgM and IgA levels but no correlation was found between salivary IgM and IgG levels as well as between salivary IgG and IgA levels (Table.4).

**Table.4: Correlation between Salivary Igs levels (IgM, IgG and IgA) in the Study Samples.**

| **Salivary Igs levels in Smokers** | | **r** | **p** | **Significance** |
|---|---|---|---|---|
| IgM(mg/dl) | IgG(mg/dl) | -0.092 | 0.599 | Non-significant |
| | IgA(mg/dl) | -0.197 | 0.256 | Non-significant |
| IgG(mg/dl) | IgM(mg/dl) | -0.092 | 0.599 | Non-significant |
| | IgA(mg/dl) | 0.046 | 0.792 | Non-significant |
| IgA(mg/dl) | IgM(mg/dl) | -0.197 | 0.256 | Non-significant |
| | IgG(mg/dl) | 0.046 | 0.792 | Non-significant |
| Salivary Igs levels in Non-Smokers | | r | p | Significance |

***Cont...*** **Table.4: Correlation between Salivary Igs levels (IgM, IgG and IgA) in the Study Samples.**

| | | | | |
|---|---|---|---|---|
| IgM(mg/dl) | IgG(mg/dl) | 0.124 | 0.478 | Non-significant |
| | IgA(mg/dl) | -0.43 | 0.807 | Non-significant |
| IgG(mg/dl) | IgM(mg/dl) | 0.124 | 0.478 | Non-significant |
| | IgA(mg/dl) | 0.08 | 0.649 | Non-significant |
| IgA(mg/dl) | IgM(mg/dl) | -0.43 | 0.807 | Non-significant |
| | IgG(mg/dl) | 0.08 | 0.649 | Non-significant |

According to the BMI and SI in smokers, no significant differences were found in both serum and salivary Igs levels.

## Discussion

Alteration in the immunological functions for both antibody and cell mediated immunity might be due to the inhalation of tobacco smoke[12, 13] .Several previous studies in other countries authorized that serum levels of Igs were lower in smokers by 10-20% as compared with non-smokers individuals[14].Depending on the results of the current study, non-significant increase in terms of serum IgM was found in smokers which came in agreement with the results of Arinola *et al.*[15] and Gonzalez-Quintela *et al.*[16] who stated that this increased may be attributable to the ability of IgM in neutralizing the harmful toxins found in tobacco smoke by complement activation, conversely, Tarbiah *et al.*[13] reported a significant increased while Olayanju *et al.*[17] reported a significant decreased in the serum IgM in smokers as compared with non-smokers. In addition results of this research showed that both serum IgG and IgA levels were decreased significantly in smokers which were similar to the findings of Tarbiah *et al.* [13] in terms of IgG and Aula and Fikry[18] in terms of IgA level, however, IgG and IgA levels were found to be higher in smokers according to Prajapati and Jyoti study[19].Various investigations have concentrated on the possible mechanisms by which tobacco smoke might alter B-cells (which responsible for the production of Igs after their differentiation into plasma cells) development, functioning and distribution, it was found that tobacco smoke might cause down regulation of murine marrow B220+CD34- pre-B cells and/or B220+CD34+ pro-B cells which they effect on B-cells development[20]. In addition several molecular studies have stated that nicotinic receptors such as α 4 and α7 subunits which have essential roles in B-cells lines show elevated expression after long term exposure to nicotine which suppress B-cells secretions[21].Furthermore, it was found that proliferative ability of T-cells and T-cells dependent antibody responses were decreased in smokers which subsequently suppress B-cells functions and causes reduction in the production of serum Igs[22].Moreover low number and impaired functions of regulatory B-cells in smokers infected by Helicobacter pylori had been improved by Li *et al.*[23].It was found that after smoking cessation the levels of serum IgM and IgG were increased significantly, however the level of IgA remained the same[24].Despite the fact that blood considered as an essential sample for disease diagnosis; saliva reveals the mucosal and systemic expression of many biomarkers in the human body, salivary IgA initiate from the plasma cells found in salivary glands, while salivary IgM and IgG are mainly originate from the serum[25].Regarding the results of the present study, salivary IgM revealed non-significant increase in smokers which analogs with the results of Barton *et al.* [26] but a significant decreased in salivary IgG and IgA which came in agreement with the results of Giuca *et al.*[27].It has been demonstrated that tobacco smoke has an adverse effect on the oral mucosa by altering the amounts of saliva secretions, enzymes and immune functions[28], so the reduction of salivary Igs which have important roles in mucosal defenses may increase the susceptibility of the smokers to develop several oral infections such as chronic periodontitis[29]. Low level of salivary IgA which was found in this paper may be due to the perceived impact of tobacco smoke on the salivary glands or on other immunological cells that responsible for the production of salivary IgA. The absence of positive correlation in the smokers Igs levels in both serum and saliva in this study may be due to the smaller size of the smoking samples, in addition this study included only men because of the low prevalence

of smoking in females.

## Conclusions

According to the data of the current study, tobacco smoking is strongly associated with the suppression of B-cell functions and thus alters the Igs production and levels in both serum and saliva samples of smokers individuals.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest**: Non

**Funding**: Self-funding

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# Association of Retinol Binding Protein-4 and Microalbuminuria and Blood Glucose Regulation in Type 2 Diabetic Iraqi Patients

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## Abstract

**Retinol binding protein 4 (RBP-4)** has long been known as the carriers for vitamin A, in the plasma it is banded to transthyretin to form too large complex for glomerulus filtration. Discovered as adipokine involved in the pathogenesis of type 2 diabetes induced insulin resistant and linked to obesity. Diabetic nephropathy one of serious microvascular complication that impact large numbers of the patient however, association with RBP-4 is not fully known.

The present study tested this hypothesis by measuring serum RBP4 in samples of Iraqi type 2 diabetic (n=120) with normal albumin excretion (n=57) and microalbuminuria (n=63) of either sex. and Also apparently health subjects (n=30) were involved to serve as control.

Concentrations of the RBP4 were significantly elevated in serum of microalbuminuric diabetic patients as compare with normoalbuminuric patients, ($p=0.000<0.05$). also glycemic index parameters significantly higher (for all $p<0.05$).

In conclusion, the study suggested that serum level of RBP4 are affected by microalbuminuria and the assessment of RBP-4 as controller for insulin resistant in type 2 diabetic in further studies must take into consideration other renal problems.

***Key Words:*** *retinol binding protein 4 (RBP4), type 2 diabetes mellitus, microalbuminuria.*

## Introduction

Diabetes is a set of metabolic defects recognizes mainly by hyperglycemia as a result of impairment in insulin sensitivity and/or secretion. Chronically, long-term hyperglycemia causes damage and dysfunction of multiple organs (kidneys, heart, eyes, nerves and blood vessels) [(1)]. The latest approximations show that there was a global prevalence of 463 million people with diabetes (9.3%) in 2019, which is expected to rise to 700 million (10.9%) by 2045, of whom 90% have type 2 diabetes [(2)].

About one third of diabetic patients will finally have progressive deterioration of renal function. The first clinical sign of renal dysfunction is generally microalbuminuria, which is occasionally reversible in type 2 diabetes, but may progresses to obvious proteinuria and then into chronic kidney disease. Most patients who have microalbuminuria are at greater risk to develop cardiovascular diseases (CVD) [(3)], this can be explained by the hypothesis that widespread vascular damage is resulting from renal albumin leakage, in other words, microalbuminuria seems to reflect a state of vascular dysfunction and is associated with changes in vasomotor tone regulation of peripheral vessels [(4)]. Furthermore, damaged endothelial cells secreted cytokines and growth factor and they accumulate into sub endothelial space of the injured region, this promoting atherogenic changes that makes an individual susceptible to CVD and other organ damage [(5)].

Retinol binding protein (RBP4) is a 21,000 Da protein that belongs to the lipocalin family of proteins; it has long been known as the carriers for retinol. Retinol is bound to apo-RBP4 which is attached to transthyretin

(TTR) to form too large complex (retinol-RBP4-TTR). The latter prevents glomerular filtration of RBP4 [6-8].

After delivery of retinol to target tissue, RBP4 is glomerulofiltered and degraded in the proximal tubules; thus, glomerular filtration rate (GFR) determines RBP4 concentration [9]. the impaired catabolism of the RBP4 complex in the kidneys leads to the accumulation of a truncated variant of RBP4 in plasma of patients with chronic renal failure; indicating the central importance of kidney function in the regulation of plasma RBP4 levels [5].

Ziegelmeier et al has correlated RBP4 to clinical and biochemical measures of renal function, glucose and lipid metabolism and inflammation in patients with a mild to moderate decrease in GFR [10]. In this study, higher levels of RBP4 were recorded in plasma of dialysis patients even though they excrete RBP4 in urine. Moreover, serum creatinine had predicted RBP4 concentrations in the control subjects with a GFR >50 ml/min [10].

In addition to its important function as retinol transporter, RBP4 is linked to obesity-induced insulin resistance and type 2 diabetes [11, 12]. The association of microalbuminuria with insulin resistance has been documented in both type 2 diabetic patients as well as in non-diabetic individuals [13, 14]. Serum RBP4 has also shown to be associated with albumin excretion; the relationship was not fully clarified [15, 16].

In the present study, we aimed to investigate the association of serum RBP4 with microalbuminuria levels and blood glycemic indices, fasting blood glucose (FBG) and glycosylated hemoglobin (HbA1c), in sample of type 2 Iraqi diabetic patients.

## Subjects and Methods

This cross-sectional study was conducted out in Specialized Center of Endocrinology and Diabetes in AL-Nasiriya city, south of Iraq. A total of 150 subjects were enrolled in the study; 120 of whom were an already diagnosed type 2 diabetes mellitus patients according to the American Diabetes Association Criteria [17], of age ≥ 18years and of either sex, with disease duration since diagnosis of at least 1 year. The remaining 30 were apparently healthy individuals to serve as control group.

Pregnant women, patients with end stage renal disease (ESRD) or patient on renal dialysis and patients with hepatic failure were excluded from the study.

Medical and social history were taken for each participant. Venous blood samples were collected after 12 hours of fasting. Ten milliliters blood samples were taken using 10 ml disposable syringes; about 2 ml of the collected blood was transferred to EDTA tube for analysis of glycosylated hemoglobin (HbA1c) by high performance liquid chromatography [18]. While (8 ml) of the blood was transferred to plane tube and centrifuged at (3000 rpm) for 10 minutes to obtain serum, which is used for the measurement of fasting blood glucose (FSG), blood urea (BU) and serum creatinine (S.cr.) by colorimetric assay [19]. The remaining part of serum was divided in Eppendorf tubes and kept frozen at (–20ºC) for the measurement of serum RBP-4 by enzyme-linked immunosorbent assay (ELISA) [20]. Finally, urine sample was collected from each participant for the measurement of microalbuminuria levels (MU) by NycoCard U-Albumin [21].

## Statistical Analysis

The statistical analysis was performed using The statistical package for social science (SPSS), version 25. Data are expressed as mean ± standard error of mean (SEM). Comparison of means of two groups were done by using student t-test. Categorical variables were presented as number and analyzed by the chi-square $\chi^2$- test. Pearson's correlation was used to study the correlation between different parameters and RBP4 Values. $P<0.05$ were considered significant.

## Results

The sociodemographic and clinical charecteristics of the participants are selected. Type 2 diabetic patients and control groups were of comparable age, gender and body mass index (BMI) (P-value >0.05). Fifty two of the diabetic subjects were males, and 68 were females. The mean age of them was (50 ±8) ranging from 33 to 69 year; and mean BMI was (29.3 ±4) kg/m$^2$. Regarding the control group, 13 of the subjects were males and 17 were females. Their mean age was (48.3 ±8.7) ranging from 32 to 65 year, and mean BMI was (27.9 ±4).

Serum RBP4, FBG, HbA1c% and MU levels were significantly higher in the diabetic group as compared with the control group ($P<0.05$). While, there was no significant difference in serum creatinine and blood urea between the diabtic and the control groups.

Diabetic subjects were divided according to urinary albumin excretion into two groups: normoalbuminuric patients with normal urinary albumin excretion (0-18 µg/l), (n=63); and microalbuminuric patients with albumin excretion (> 18 µg/l), (n=57). Sociodemographic and clinical characterizes for each group as choosen. There was no significant difference between the two diabetic groups with regard to gender, BMI, smoking habit and blood urea (P>0.05). Meanwhile, age, disease duration, serum RBP4, FBG, HbA1c and serum creatinine were significantly higher in diabetic patients with microalbuminuria (P<0.05).

Correlation studies of serum RBP4 with the studied variables of the pooled data are shown in Table 1. Serum RBP4 has a positive correlation with BMI, FBG, HbA1c, and microalbuminuria levels (P<0.001), and serum creatinine (P<0.05). While, there was no correlation between serum RBP4 with age, gender and blood urea (P>0.05).

**Table 1. Pearson's correlations of serum RBP-4 with the studied variables of the pooled data.**

| **Variable** | **r-value** | P-value |
|---|---|---|
| Age | 0.07 | 0.36 |
| Gender | -0.07 | 0.27 |
| BMI | 0.38 | 0.000* |
| FBG | 0.6 | 0.000* |
| HbA1c | 0.5 | 0.000* |
| BU | 0.06 | 0.4 |
| S. cr. | 0.17 | 0.04* |
| MU | 0.35 | 0.000* |

BMI, body mass index, FBS=fasting blood sugar, HbA1c= glycosylated hemoglobin, BU=blood urea, S.cr=serum creatinine, MU=microalbumin in urine**.** * Significant when p<0.05.

Correlation studies of serum RBP4 with the studied variables of the diabetic patients are shown in Table 2. Serum RBP4 has a positive correlation with disease duration, BMI, FBG, HbA1c and microaluminuria levels (P<0.05). While, it was not correlated with age, gender, serum creatinine and blood urea (P>0.05).

**Table 2. Pearson's correlations of serum RBP-4 with the studied variables of the diabetic subjects**

| **Variables** | **r-value** | **P-value** |
|---|---|---|
| Age | 0.14 | 0.13 |
| Gender | -0.1 | 0.15 |
| Disease duration | 0.5 | 0.000* |
| BMI | 0.31 | 0.001* |
| FBG | 0.6 | 0.000* |
| HBA1c | 0.4 | 0.000* |
| BU | 0.09 | 0.3 |
| S.cr. | 0.14 | 0.1 |
| MU | 0.33 | 0.000* |

BMI= body mass index, FBG=fasting blood glucose, HbA1c= glycosylated hemoglobin, BU=blood urea, S.cr=serum creatinine, MU=microalbumin in urine**.**

* Significant when p<0.05.

## Discussion

In the present study serum RBP4 levels were significantly higher in the diabetic study group than in the control group. Serum RBP4 levels were positively correlated with the glycemic indices, FBG and HbA1c, of the total study subjects or of the diabetic group. High plasma levels of RBP4 have been reported in many conditions characterized by insulin resistance such as obesity, polycystic ovarian syndrome, and type 2 DM [22, 23]. Moreover, exercise-induced improvement in insulin sensitivity was shown to be associated with a reduction in serum RBP4 levels [15]. In mice, it was found that RBP4 interferes with expression and phosphorylation of insulin receptor substrates in skeletal muscle. While, in the liver, RBP4 induces expression of phosphoenolpyruvate kinase [22]. Therefore, elevated RBP4 levels in humans might participate in impairment of insulin-induced uptake of glucose by skeletal muscles and elevated fasting hepatic glucose production, which are two important characteristics of type 2 DM. Furthermore, RBP4 may negatively affect pancreatic beta cells function [24]. It is worthy to mention that RBP4 gene is located on human chromosome 10q, a locus near regions that reported to be related with hyperinsulinemia or type 2 DM developed early in life in two populations [25].

Serum RBP4 levels were significantly higher in diabetic patients with microalbuminuria than in those with normoalbuminuric, and there was a significant positive correlation between serum RBP4 levels and microalbuminuria levels. Similar findings were reported in other studies [26]. Microalbuminuria represents an early marker of nephropathy developed in diabetic patients[27] , and it is also reported to be associated with insulin resistance in diabetic patients and in non-diabetic subjects [13]. As mentioned earlier, RBP4 (low molecular weight protein) is mainly cleared by the kidney, and its serum levels are determined by the glomerular filtration rate (GFR) and become greatly elevated in end-stage renal disease [5, 9]. However, in case of microalbuminurea; it is unlikely that pobable variation in GFR was responsible for for the raised RBP4 levels in microalbuminuric diabetic patients [28]. So this elevation of plasma free RBP4 has been recognisesd by the liver as a positive-feedback signal from peripheral tissues for the release of the RBP4-retinol complex [29], whereby RBP4 elevates in plasma of type 2 diabetic subjects with miocroalbuminuria.

**In conclusion**, our results revealed that serum RBP4 levels are high in type 2 diabetic patients and may be linked to the early manifistations related to the development of nephropathy, specifically, microalbuminuria. In addition, serum RBP4 correlate positively with the FBG and HbA1c. Larger scale study for the assessment of serum RBP4 levels as predictor of diabetic nephropathy is recommended.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding:** Self-funding.

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# Assessment of Nurses Knowledge Toward Neonate with Birth Asphyxia at Neonatal Intensive Care Unit in Pediatric Hospitals at Babylon Governorate

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## Abstract

**Background:** Birth asphyxia is neonates' inability to activate and sustain breathing at conception .. It is also recognized as a condition that arises when blood gas delivery is compromised, contributing to hypoxemia and hypercapnia The combination of hypoxia and ischemia may contribute to a cascade of biochemical changes in the body contributing to neuronal brain loss and brain harm

**Objectives:** In order the aim of study to Identify the demographic characteristic of sample , Identify knowledge of nurses in caring of neonate with birth asphyxia at NICU at pediatric hospitals in Babylon governorate , determine the relationship between nurses knowledge with birth asphyxia at NICU with certain of socio- demographic characteristics of sample Babylon, Iraq.

**Methodology:** A comprehensive research is undertaken to investigate nurses' understanding of Neonate with Birth Asphyxia in the Neonatal Intensive Care Unit at Babylon Governorate Pediatric Hospitals A randomized random sample of (62) nurse is chosen with the usage of the chance sampling method. The research group is spread in the Neonatal Intensive Care Unit at Babylon Governorate Pediatric Hospitals. The data was obtained using a built-in self-report questionnaire and evaluated using the concise statistical analysis method that involves "frequencies & percentages" and the Inferential statistical data analysis methodology used for the Chi-square test.

**Results:** Results of the analysis show that the participants with excellent awareness served (66.1 percent), whereas those with bad information (33.9 percent) reflected nurses in the Neonatal Intensive Care Unit at the Babylon Governorate Pediatric Hospitals. In comparison, the mean age of experienced nurses is 32.73 ± 9.33 while those with bad awareness are 26.05 ± 5.86. Significant linkages exist between Education and awareness engagement, $p = 0.015$.

**Conclusions and recommendations :** Around 66 per cent of nurses have experience of birth asphyxia, the study showed. Despite Born Asphyxia, about half of them have strong and optimistic disposition towards Neonate. Education will be deemed to improve nurses' awareness of Neonate with Birth Asphyxia

***Key words:*** *Knowledge, Nurses, birth asphyxia.*

## Itroduction

Birth asphyxia is neonates' inability to activate and sustain breathing at conception .. It is also recognized as a condition that arises when blood gas delivery is compromised, contributing to hypoxemia and hypercapnia The combination of hypoxia and ischemia may contribute to a cascade of biochemical changes in the body contributing to neuronal brain loss and brain harm **(1).** According to the (World Health Organization; 2007) Birth asphyxia can occur as a result of factors such as premature lungs with inadequate surfactant for proper functioning. Maternal, placental, or fetal triggers can be involved. Complications such as obesity, disease and drug consumption are motherly triggers Placental disorders such as placenta Previa, placental abruption or post-maturity may trigger asphyxia in utero **(2)** The fetal asphyxia triggers include complications with the thread, pregnancy, early delivery and multifetal childbirth.

(Maternal Newborn Foundations) However, if the arterial umbilical cord pH is < 7, the neonate is asphyxiated; the Apgar level is 0-3 for longer than 5 minutes; has cognitive signs such as epilepsy, paralysis or hypertension; and multisystem organ failure like cardiovascular failure;, gastrointestinal, hematological, pulmonary, or renal system [(3)] Relevant risk factors for prenatal asphyxia involve gestational maternal age below 16 or over 35 years. Age 41 years, asthma, prescription substance and alcohol consumption, hypertensive conditions, excessive breakup of the membrane, maternal inflammation, second or third trimester bleeding and > 24 hours' labour [(4)] The clinical form of birth asphyxia is persistent hypoxia, hypercapnia, hypo- perfusion, and metabolic acidosis. Birth asphyxia will be treated if the infant has gasping and insufficient respiration or no breathing at one minute, according to the Regional Neonatology Forum of India. It correlates to 3 minute or less of an Apgar ranking [(5)] All the attendants must also be trained in newborn resuscitation and must have the appropriate equipment ready to resuscitate the newborn infant. Approximately resuscitation equipment is necessary for effective treatment of asphyxia; but, without the use of equipment, asphyxiated babies can be resuscitated. For the event of birth time asphyxia. Newborn mothers should realize the value of interventions which contribute to the prevention of birth asphyxia. Nonetheless, this concern focuses mainly on the treatment of birth asphyxia, which is neonatal resuscitation rather than avoidance.

## Methodology

**Study design:** A comprehensive research is performed at the Neonatal Intensive Care Unit in Pediatric Hospitals, Babylon Governorate Babylon Teaching Hospital for Maternity and Children, and AL-imam Al-sadiq Clinic. Babylon Governorate, Babylon Health Directorate / Iraq.

**Study Sample:** A randomized random selection of (62) nurse is chosen through use of the approach to chance sampling. The research sample is spread in the Maternal and Children's Neonatal Intensive Care Unit in Pediatric Hospitals at Babylon Governorate Babylon Teaching Hospital and AL-imam Al- sadiq Hospital.

**Study Instrument:** Data collection tool which comprises the following:

**Part I**: Socio-demographic profiles of pediatric nurses in the Babel government clinics for newborns with birth asphyxia comprise (9)items and Respiratory structure and roles comprise (6)items.

**Part II**: Issues for evaluating the awareness of newborns with birth asphyxia include (6) items and reasons, and (4) items at risk for congenital asphyxia.

**Part III**: Issues for testing nurses on birth asphyxia include (12) objects, clinical symptoms include (2) objects and medical evaluation include (1) item.

**Data Collection the Methods:** The data were collected using a built-in self-report questionnaire. To get oral consent, the researcher introduced himself to the participants and clarified the intent of the test.

**Statistical analysis:** Data entry and interpretation were conducted using computer program SPSS version 23 (statistical kit for social sciences), categorical variables were presented as concentrations and percentages, continuous variables were presented as (mean ± standard deviation). The same Pearson chi square / Fisher check was carried out to establish the relation between categorical variables, In addition, student t-tests were used to evaluate mean discrepancies between classes. The P value of 0.05 has been considered statistically important

## Results

**Table (1): Nurses their Demographic Characteristics**

| Variable | mean±SD | Range |
|---|---|---|
| Age (year) | 30.47±8.86 | 35(19-54) |
| Gender<br>Male<br>Female<br>Total | <br>38<br>24<br>62 | <br>61.3%<br>38.7%<br>100.0% |

| | | |
|---|---|---|
| Marital status | | |
| Single | 16 | 25.8% |
| Married | 46 | 74.2% |
| Divorce | 0 | 0.0% |
| Widow | 0 | 0.0% |
| Separated | 0 | 0.0% |
| Total | 62 | 100.0% |
| Educational level | | |
| Preparatory nursing | 11 | 17.8% |
| Diploma | 34 | 54.8% |
| Bachelor | 14 | 22.6% |
| Master | 3 | 4.8% |
| Total | 62 | 100.0% |

This table shows that the mean age of nurses in year is 30.47±8.86 ranging from (19-54),two third of whom (61.3%) are male,74.2% of the respondents are married and just over half of them (54.8%) have a diploma.

**table (2): Nurses Knowledge Distribution of mean knowledge of nurse regarding birth asphyxia(n=62)**

| **Variable** | **Mean** | **Frequency** | **Percentage(%)** |
|---|---|---|---|
| Good knowledge | ≥ 17.85 | 41 | 66.1% |
| Poor knowledge | <17.85 | 21 | 33.9% |

This table shows that the participants with good knowledge represented (66.1%),while those with

poor knowledge represented (33.9%). The overall knowledge were estimated by taking the average score of all subscales ,the subscales score were obtained by summing items score and dividing by the total number of items. Good knowledge is participant who scored above or equal mean for knowledge questions.

Poor knowledge is participant who scored below mean for knowledge questions. Finding reveals that the majority of (60.7%) were poor knowledge of nurses at primary health care centers in Babylon Governorate.

**Table( 3): Association between variables related to work and training of nurses and knowledge(n=62)**

| **Study variables** | **Knowledge** | | |
|---|---|---|---|
| | **Good** | **Poor** | **p-value** |
| **Participation in training course** | | | |
| **Yes** | 37(90.2%) | 13(61.9%) | |
| **No** | 4(9.8%) | 8(38.1%) | **0.015*F** |
| **Total** | 41(100.0%) | 21(100.0%) | |
| If yes, type of training (n =50) | | | |
| Theoretical | 9(24.3%) | 3(23.1%) | |
| Practical | 6(16.2%) | 0(0.0%) | 0.402[F] |
| Both | 22(59.5%) | 10(76.9%) | |
| Total | 37(100.0%) | 13(100.0%) | |

***Cont...*** **Table (1): Nurses their Demographic Characteristics**

| | | | |
|---|---|---|---|
| Place of training (n =50)<br>Inside Iraq<br>Outside Iraq<br>Total | 37(100.0%)<br>0(0.0%)<br>37(100.0%) | 12(92.3%)<br>1(7.7%)<br>13(100.0%) | 0.26F |
| Number of times of training (n =50)<br>One time<br>Twice<br>More than twice<br>Total | 10(27.0%)<br>7(18.9%)<br>20(54.1%)<br>37(100.0%) | 2(15.4%)<br>4(30.8%)<br>7(53.8%)<br>13(100.0%) | 0.57F |
| Time till last training (year) (n=50)<br>Less than 1<br>1-2<br>More than 2<br>Total | 15(40.5%)<br>15(40.5%)<br>7(19.0%)<br>37(100.0%) | 4(30.8%)<br>6(46.1%)<br>3(23.1%)<br>13(100.0%) | 0.84F |

***P value ≤ 0.05 was significant , F: Fisher exact test**

Table (3)shows that Fisher exact test was conducted to show an association between variables related to work and training of nurses and knowledge regarding birth asphyxia (good or poor).

There is significant association between participation in training course and knowledge, p value = 0.015.

## Discussion

Part I: Discussion the demographic characteristics

Our results reflect the concise data of the socio-demographic details of the nurses who function in frequency and percentage terms in the neonatal intensive care unit. Of the (62) participants that took part in this research, their age distribution of nurses in the year was 30.47±8.86, varying from (19-54), two-thirds of which (61.3%) were male, (54.8%) had a certificate, (22.6%) had a Bachler, , (4.8%) had a master's degree According to their professional success, most nurses (54.8%) graduated with a nursing certificate, since the credential was deemed to be the highest percentage of staff nurses in a health system regardless of the vast number of establishments graduating with that degree. This statement also came from the pediatric hospitals' neonatal intensive care unit We are largely reliant on nurses who have graduated from nursing and high school while nurses that have graduated from nursing college are assigned to specific units of hospitals and are only in low numbers compared with other patients.

74.2% of respondents are dating and only over half are female as the bulk of these age ranges are dating., especially after the conclusion of the nursing studies and appointments. Where the Iraqi young take advantage of the marriage hand after graduation from the study and the availability of work opportunities. Mean years of clinical practice varied from (1-22) 7.77±4.94. Third (80.6%) took part in educational or academic classes, nearly exclusively inside Iraq (98.0%). 38.0 percent of nurses indicated that the last time they provided infant resuscitation instruction was the previous year, this finding was followed by a survey carried out of Awareness Evaluation, Birth asphyxia treatment mindset and experience at the Federal Medical Center Asaba, Delta State-Nigeria. Their analysis shows that 16 (32%) of the respondents have at least one neonatal resuscitation experience while 3 (6%) have two experience cycles. 3(6%)had less than a year earlier, 7

(14%), 2 (4%) and 5 (10%) had their last schooling from 1-2 years, 3-4 years.. And 12(0) appropriately for 1-5, 6-10, 11-15, 16-20 and 21-30. With regard to experience in neonatal resuscitation, respondents ranked 9.6 (2.9) and 10.1 (2.3) respectively for those with and without experience [6]

**Part II: Discussion the nurses knowledge**

The result indicates that participants with good information identified (66.1 per cent) strong information are participants who ranked at or equivalent mean for questions of knowledge. This finding is followed by a research conducted to determine the efficacy of a formal training system on information regarding neonatal asphyxia control among staff nurses in pediatric allied units in selected hospitals of Punjab According to this report, 24 (80%) respondents had strong information, 2 (6.67%) had great knowledge and 4 (13.33%) had outstanding knowledge in the experimental category and 23 (76.67%) respondents had acceptable knowledge and 7 (23.33%) had less than average knowledge in the control group [7] .

Weak information (33.9 per cent) was reflected. Participants who ranked below mean for information questions are followed by a test performed in Evaluation of Information of Birth Asphyxia in staff nurses employed in the workplace and NICU Results of this research 5 (16.67%) had weak awareness [8] .

**Part III: Discussion the relationship between variables related to work and training of nurses and knowledge**

Findings indicate the connection of information linked to birth asphyxia among nurses and their demographic characteristics. There is a strong correlation between involvement in training and information, p value = 0.015 This finding fits the test findings obtained in a cross-sectional analysis obtained in Nigeria Education. Health care professionals, so they should boost their capacity to provide patient treatment. It will also improve the capacity and their awareness to control birth asphyxia. Just 29.4 percent of nurses have been qualified in the new research. This result was comparable with the result in the analysis in Kenya that only 23% of the test participants provided training [9] .

## Conclusions

In terms of awareness, birth asphyxia was bad awareness among nurses. Nurses years of neonatal intensive care unit practice and preparation programs play an significant part in their expertise. To develop awareness, it requires to hire comprehensive educational courses relevant to birth asphyxia and neonate resuscitation.

**Ethical Clearance**

The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding**: Self-funding

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# Evaluating the Concentration of Cotinine, Lead and Cadmium in Newborns with Respsiratory Distress Syndrome

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## Abstract

**Background** Respiratory distress syndrome is one of the most common problems of newborns. Respiratory distress syndrome occurs when there is no enough surfactant in the lungs. Heavy metals are naturally occurring elements that have a high atomic weight and a density at least 5 times greater than that of water. Lead is a heavy metal, it is important environmental toxicant; the toxic effects of lead include many systems in the body like central and peripheral nervous system. Cadmium is heavy metal that exerts toxic effects on the kidney, the skeletal and the respiratory systems, and is classified as a human carcinogen. Nicotine, the main alkaloid of tobacco. It is readily absorbed from tobacco smoke, and its concentration rises over 6-8 hours during the day in regular smokers. About 70 to 80% of nicotine is metabolized to cotinine. **Methods** The study was carried out for 50 newborns divided in two groups: *Group 1*: 25 newborns with respiratory distress syndrome. Group 2: 25 newborns without respiratory distress syndrome. **Results** According to Demographic characteristics there are no significant differences when compered the age, gender, duration of pregnancy and the age of the mothers of newborns with respiratory distress syndrome and normal newborns *($p<0.05$)*. the whole blood lead and serum cotinine concentration in newborns with respiratory distress syndrome was significantly higher compering with normal newborns (*$p<0.05$*). The whole blood cadmium concentration in newborns with respiratory distress syndrome was not significantly different comparing with normal newborns *($p<0.05$)*. **Conclusions** Newborns with respiratory distress syndrome have high serum level of cotinine and whole blood lead when compared to healthy newborns.

***Keywords:*** *Cadmium, cotinine, Heavy metals, Lead, Nicotine, Respiratory distress syndrome*

## Introduction

Respiratory distress syndrome (RDS), or hyaline membrane disease, is one of the most common problems of newborns. It can cause newborns to need extra oxygen and help to breathe [(1)]. Respiratory distress syndrome occurs when there is no enough surfactant in the lung. When there is not enough surfactant, the tiny alveoli collapse with each breath. As the alveoli collapse, damaged cells collect in the airways and further affect breathing ability. As the newborn's lung function decreases, less oxygen is taken in and more carbon dioxide accumulates in the blood. Signs and symptoms of RDS include**:** cyanosis, flaring of the nostrils, tachypnea, grunting sounds with breathing, chest retractions [(2)]. RDS is usually diagnosed by chest X-rays of the lungs, blood gas tests and Echocardiography. [(3)] The multiple uses of heavy metals in industry, domestically, agriculturally, medically and technologically have led to their wide distribution in the environment [(4)]. Lead is a naturally occurring, present in small amounts in the earth's crust [(5)]. Exposure to lead and lead chemicals can occur through ingestion, inhalation and dermal contact, most human exposure to lead occurs through ingestion and inhalation [(6)]. Lead metal causes toxicity in living cells by ionic mechanism and that of oxidative stress. Antioxidants, e.g. glutathione, present in the cell protect it from free radicals such as $H_2O_2$. Under the influence of lead, however, the level of the ROS increases and

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the level of antioxidants decreases [7]. Cadmium (Cd) is a toxic heavy metal and the components of tobacco, together with water and food contamination, represent the main sources of non- occupational exposure in the general population. Cd enters the human body mainly after inhalation of environmental tobacco smoke and also via gastrointestinal absorption [8]. Continuous exposure to low levels of Cd may result in bioaccumulation and can cause a variety of adverse health effects on human beings, among which kidney function, lung diseases, and disturbed calcium metabolism and bone effects are the most prominent, depending upon the level and duration of exposure [9].Cadmium increases the activity of some hydrolytic enzymes such as peroxidase that lead to intensifying the respiration of the cells and depletion of the cells nutrients during this process that leads to the acceleration of senescence [10].

Nicotine, the main alkaloid of tobacco, is responsible for its addictive effect. About 70 to 80% of nicotine is metabolized to cotinine [11]. As the primary metabolite of nicotine, cotinine has been widely used as a specific biomarker of tobacco exposure because its half-life in the body (12-20 hours) is longer than that of nicotine (3-4 hours) [12].

## Subjects and Methods

### Research setting

A cross sectional study of 50 newborn babies divided as follows:

1- **Group 1**: 25 newborns with respiratory distress syndrome (RDS). The newborns within this group were taken from Al-Elwayia Pediatric Teaching Hospital.

**2- Group 2:** 25 newborns without respiratory distress syndrome (RDS). The newborns within this group were taken from welfare pediatric Teaching Hospital- Medical city

The newborns were taken from both sexes, at the age range from 24 hours to one week. This study was conducted from the 1st of March to the 30th of July 2019

### Blood sampling:

Approximately (3 ml) of venous blood was taken from each newborn, which divided into three tubes:

- The first tube (2 ml) whole blood is collected into EDTA tube for the measurement of blood levels of Pb and Cd by atomic absorption.

- The second tube (0.5ml) is collected in a gel tube from which immediately the serum was separated by centrifugation for the measurement of the concentration of cotinine by cotinine Elisa kit.

### Biochemical assay

Frozen serum was allowed to thaw at room temperature; assessment of inorganic elements (Pb) was performed by flame atomic absorption spectrophotometry (FAAS) [13], while (Cd) was performed by graphite furnace atomic absorption spectrophotometry (GFAAS) [14].

## Statistical Analysis

All the results were expressed as mean± standard deviation (SD). The data were analyzed by utilizing a computerized statistical package for the social sciences SPSS program. Unpaired Student t-test was performed for each group pair includes a comparison between two groups (P-values < 0.05) were considered to be statistically significant [15]. A chi-square test was used to assess the statistical significance in distribution between different discrete variables [16].

### Ethical Consideration

All administrative and Ethical approvals were taken from the parents, the administrative team of the hospital including the managing director, the head of the departments and collage of pharmacy- University of Baghdad.

## Results

### Demographic Characteristics

In table (1), according to the age of newborns, there is no significant difference in the age of RDS newborns when compare to the normal newborns *(p>0.05)*, the same finding was seen with the age of mothers in which there is no significant difference in age of mothers of RDS newborns when compared to the age of mothers of normal newborns *(p>0.05)*. The gender of RDS newborns was 18(72%) as a males and 7(28%) as females meanwhile the gender of normal newborns 15(60%) as males and 10(40%) as females. Regarding the duration of pregnancy, the duration of pregnancy of RDS newborns was not significantly differs from the duration of pregnancy of normal newborns *(p>0.05)*.

According to the residency of newborns, the residency of RDS newborns and normal newborns were significantly different *(p<0.05)*, The residency of RDS newborns was 20(80%) live in urban area and 5(20%) live in rural area meanwhile residency of normal newborns was 11(44%) live in urban area and 14(56%) live in rural area.

According to the smoking status of newborns mothers, there are significant differences when comparing the smoking status of the mothers of RDS newborns and normal newborns *(p<0.05)*. The smoking status of RDS newborns mothers was found 0(0%) for non-smoking mothers, 23(92%) for passive smoking mothers and 2(8%) for smoker mothers meanwhile the smoking status of normal newborns mothers was found 13(52%) for non-smoking mothers, 7(28%) for passive smoking mothers and 5(20%) for smoker mothers.

According to the types of delivery of newborns, there are significant differences when comparing the types of delivery of RDS newborns and normal newborns *(p<0.05)*. The types of delivery of RDS newborns was found 9(36%) for a normal delivery and 16(64%) for caesarian delivery meanwhile the types of delivery of normal newborns was found 20(80%) for a normal delivery and 5(20%) for caesarian delivery.

**Table (1): Demographic characteristics of study groups**

| | | **RDS Newborns** | **Control Newborns** | ***P-Value*** |
|---|---|---|---|---|
| **Age of newborns (days)** | | 2.92±1.29 | 3.04±1.24 | 0.7378 |
| Gender of newborns | males | 18(72%) | 15(60%) | 0.3740 |
| | females | 7(28%) | 10(40%) | |
| Age of the mothers (years) | | 25.76±6.78 | 26.44±5.75 | 0.70415 |
| Duration of pregnancy (weeks) | | 39.52±1.38 | 39.48±1.87 | 0.93203 |
| Residency | Urban | 20(80%) | 11(44%) | 0.00873 |
| | Rural | 5(20%) | 14(56%) | |
| Smoking status | Non-smoking | 0(0%) | 13(52%) | $1.1*10^{-5}$ |
| | Passive smoking | 23(92%) | 7(28%) | |
| | Smokers | 2(8%) | 5(20%) | |
| Type of delivery | Normal | 9(36%) | 20(80%) | $8.4*10^{-7}$ |
| | Caesarian | 16(64%) | 5(20%) | |

Clinical Signs and Symptoms for RDS Newborns

In the table (2), the average duration of residency of RDS newborns in the hospital was (2.72±1.2 days), the average heart rate was (159.19±1.77 beats/mints) and the average respiratory rate was (77.56±3.25 breath/mints).

According to bell shape thorax, the number of RDS newborns with bell shape thorax was 13(52%). According to grunting baby, number of RDS newborns with grunting was 9(36%). regarding to subcostal retraction, number of RDS newborns with subcostal retraction was 24(96%). Cyanosis was important sign for detecting the severity of RDS, number of RDS newborns with cyanosis was 12(48%).

The severity of RDS was categorized into three levels (mild-moderate - sever), newborns with mild RDS was 10(40%), and with moderate RDS was 7 (28%) and with sever RDS was 8 (32%).

**Table (2). Clinical Signs and Symptoms for RDS Newborns**

| | | **Clinical Sign and Symptoms for RDS Newborns** | **Normal value** |
|---|---|---|---|
| Duration of residency in hospital (days) | | 2.72±1.2 | |
| Heart rate (beats/mint) | | 159.19±1.77 | 120-160 (beats/min) |
| Respiratory rate (breaths/mint) | | 77.56±3.25 | 30-60 (breaths/mint) |
| Bell shape thorax | Positive | 13(52%) | |
| | Negative | 12(48%) | |
| Grunting baby | Positive | 9(36%) | |
| | Negative | 16(64%) | |
| Subcostal retraction | Positive | 24(96%) | |
| | Negative | 1(4%) | |
| Cyanosis | Positive | 12(48%) | |
| | Negative | 13(52%) | |
| RDS severity | Mild | 10(40%) | |
| | Moderate | 7(28%) | |
| | Sever | 8(32%) | |

Whole blood Lead and Cadmium concentration

In the table (3), according to whole blood lead concentration, the whole blood lead concentration in newborns with RDS was significantly higher when compared to the whole blood lead concentration in the normal newborns (*p<0.05*). Both groups of a newborns have a blood lead concentration higher than normal value (Normal levels in newborn: < 10 µg/dL) [17]. according to the whole blood cadmium concentration, whole blood cadmium concentration in newborns with RDS was not significantly differs when compared to the whole blood cadmium concentration in the normal newborns *(p<0.05)*. Both groups of a newborns have a blood cadmium concentration higher than normal value

(Normal blood cadmium is <0.005 µg/mL) [17].

**Table (3) Whole blood Lead Concentration**

| | RDS Newborns | Normal Newborns | P-value |
|---|---|---|---|
| whole blood lead concentration (µg/dl) | 16.36±3.1 | 13.02±2.87 | 0.0002411 |
| whole blood cadmium concentration (µg/dl) | 0.175±0.04 | 0.165±0.03 | 0.411070 |

Serum Cotinine Concentration

In the table (4), according to serum cotinine concentration, serum cotinine concentration in newborns with RDS was significantly higher when compared to serum cotinine concentration in the normal newborns *(p<0.05)*. Both groups of a newborns have serum cotinine concentration higher than normal value (normal value of cotinine less than or equal to 10 ng/mL) [18].

**Table (4). Serum Cotinine concentration**

| | RDS Newborns | Normal Newborns | P-value |
|---|---|---|---|
| Serum cotinine concentration (ng/dl) | 93.16±5.16 | 65.86±6.83 | 7.28*10-21 |

## Discussion

Respiratory distress syndrome (RDS) is a complex disease and several factors may contribute to its etiology. The incidence of RDS decreases with advancing gestational age, from about 60–80% in babies born at 26–28 weeks, to about 15–30% in those born at 32–36 weeks [19]. According to the table (1), male newborns with RDS were higher than the female newborns with RDS despite there were no significant differences between the sex when compare the healthy newborns and RDS newborns. This finding completely agrees with another previous study which found that male newborns are more likely than female newborns to develop RDS at ratio male-to-female ratio (1.3:1) [20]. These differences are thought to be partly due to androgenic actions on type II pneumocytes delaying the production of mature surfactant [21]. According to a table (1) the number of newborns with RDS who have a smoking mother or passive smoking higher than healthy newborns, this finding is compatible with previous studies which found that the cigarette smoking during pregnancy is associated with a decrease in the risk of RDS in very preterm babies [22]. In the present study, the newborns in both groups were at full term of gestation and it seems that the smoking of cigarettes loss its protective effect against RDS. According to a table (1) the number of newborns with RDS delivered by caesarian was higher than healthy newborns who delivered in a normal delivery. This finding completely matched with another previous study in which they found that at any given gestational age the incidence of RDS is greater for infants born by cesarean section, especially without established labor, than for those born by normal delivery [23]. In table (3), the concentration of lead in newborns with RDS was significantly differs comparing to healthy newborns. Lead is a well-known human reproductive toxin. For centuries, lead exposure has been linked to adverse outcomes in pregnant women and newborns [24]. There is no previous study that links between RDS and blood lead concentration but there is a previous study for children showed that children with asthma

were more likely to have 5-fold higher blood lead level (>10 mg/dL) than those without asthma . In table (4), the concentration of cadmium in newborns with RDS is not significantly differs comparing to healthy newborns. Short-term exposure to inhalation of cadmium can cause severe damages to the lungs and respiratory irritation while its ingestion in higher doses can cause stomach irritation resulting in vomiting and diarrhea. Long-term exposure to cadmium leads to its deposition in the bones and lungs. As such, cadmium exposure can cause bone and lung damage .

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**FUNDING**: Self-funding

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# Synergistic Effect of Some Natural Substances in Combination with Antibiotics on MDR *Klebsiella* isolates

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## Abstract

This study included the collection of 210 samples of Mid-stream urine samples of the patients who were confirmed to be infected with UTI by conducting a general urine examination and the patients of AL-Amriya General Hospital, Ramadi Teaching Hospital and Fallujah Teaching Hospital for the period between 2017 and January 2018. The results of the diagnosis showed a seven isolations of 17.5% of the total of 40 bacterial isolates. These isolations were diagnosed in aerobic conditions according to the microscopic examination and Culture characteristics on blood agar base and MacConkey agar as well as the biochemical tests, Diagnosis was confirmed using the modern diagnostic system VITEK2.

The synergistic activity of the natural substances used (sesame oil, olive oil, and royal Jelly) was studied against *Klebsiella* isolates by interfering with some of the antibiotics by disk diffusion method (Gentamicin, Amikacin, Ceftriaxone, Trimethoprim-Sulfamethoxazol, Nitrofurantoin, Amoxicillin/Clavulanic acid, Ciprofloxacin), and the synergic efficacy of natural materials was studied by adding 10 ul of sterile pasteurized natural substance directly to the antibiotic disk separately. The results showed increased efficacy of some antibiotics, especially Ciprofloxacin, Ceftriaxone and Amoxicillin/Clavulanic acid. so it can be concluded that sesame oil and royal Jelly have synergistic effectiveness in increasing the effectiveness of some antibiotics against *Klebsiella*.

***Key Words:*** *Klebsiella spp., Natural substance, Antibiotic resistance, Synergism*

## Introduction

The genus *Klebsiella spp* belongs to the enterobacteriaceae. This species includes several types: *K.pneumonia*, which affects all sites of the human body, especially the respiratory tract and urinary tract. The type *K.ozaenea*, affects the nose, as well as the respiratory tract and the urinary tract and blood and for the type (*K.rhinoscleromatis*) it affects the nose, and (*K.oxytoca*) It is similar to the first type in its ability to infect all sites of the human body[(1)].

These bacteria cause many diseases for both human and animal such as pneumonia, urinary tract infection, soft tissue inflammation, sepsis, meningitis, diarrhea [(2)].

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The development of bacterial resistance to antibiotics, as well as the emergence of new strains of the most important factors causing the disease, as it constitutes a major concern for society and also for public health [(3)].

The study of plant extracts is important to demonstrate the mechanics of their work and effectiveness, as well as their toxic effect. World Health Organization (WHO) has approved the use of medicinal plants to treat various diseases[(4)]. WHO has shown that 80% of the world's population (mostly developing countries) still rely on conventional medicine for the treatment of common diseases[(5)].The most important components of most vegetable oils are: Carvacrol, Eugenol, Linalool, Thymol. These compounds have been shown to have a wide spectrum of antimicrobial activity, some of which inhibit the growth of bacteria and some is lethal according to the concentration used. Sesame oil is one of the most important oils used because it contains fatty

acids (saturated and unsaturated). Unsaturated fatty acids reduce oxidation. In addition, oil contains flavonoids (Sesamol, Sesamolin, Sesamin), which have anti-oxidant properties,which contributes to keeping sesame oil in its natural properties for a long time without oxidation, and it also stimulates the work of vitamin E[6].

Research has shown that olive oil has an important effectiveness as phenolic olive oil compounds have antimicrobial properties, especially phenol compounds (oleuropein, hydroxytyrosol, tyrosol), which have been shown to have strong antimicrobial activity against several bacterial strains responsible for intestinal inflammation, respiratory tract infections and urinary tract infections[7,8]. Antimicrobial activity against foodborne pathogens such as *Staphylococcus aureus* and *Salmonella enteritidis* has been demonstrated in the laboratory when use high concentrations of oleuropein[9,10] have been used. In addition, oleuropein and hydroxytyrosial have antimicrobial effects against pathogenic bacteria and viruses[11,12].

On the other hand, some studies have shown that royal jelly has an anti-bacterial effect higher than the rest of bee products. The most sensitive organisms recorded are *S. aureus*, followed by *E. coli*[13]. Recently, royalisin, a powerful antimicrobial protein in royal jelly, has demonstrated the selective growth inhibition against gram-positive bacteria (*Lactobacilus helveticus*, *Clostridium*, *Corynebacterium*, *Leucnostoc*, *Stafilococcus*, *Streptococcus*), with effective concentrations less than 1μm[14]. Propolis and albumin in royal jelly have a role in inhibiting bacterial growth. Propolis also has a synergistic effect with antibiotics in the treatment of infections and also reduces resistance of antibacterial walls to bacterial cells[15].

## Materials and Methods

### Collection of samples

Urine samples were collected according to method[16], in special and sterile container, who have been found to have UTI through primary examination, which includes see of Pus cells and RBCs In the urine under microscope , to confirm the infection of the urinary tract, and then transferred directly to the laboratory under refrigerated conditions for the purpose of culture and diagnosis for the period between October 2017 to January 2018.

### Isolation and diagnosis of *Klebsiella* spp.

### Diagnosis by simple methods

Bacterial isolates were identified based on both culture characterize, microscopic examination, and biochemical tests, and based on what Goldman and Lorence[17].

- Culture characteristic and microscopic examination

the shape of the colonies on the different culture media , size, height, shape of edges, color, and ability to ferment some of the sugars were observed and made smears for gram stain and examined under a light microscope to observe the shape and arrangement of bacterial cells and also their response to the gram stain.

- Biochemical tests

These tests were conducted according to the way they were[18] and also[19].

### Diagnosis in modern methods

The diagnosis was confirmed using the VITEK2 diagnostic kit was used to further confirm the diagnosis of isolates for the species level[20].

### Antibiotic sensitivity test

The efficacy of antibiotics (Gentamicin, Amikacin, Ceftriaxone, Trimethoprim-Sulfamethoxazol, Nitrofurantoin, Amoxicillin/Clavulanic acid, Ciprofloxacin) was tested against bacteria by following the disc diffusion method, depending on the method [21], then the bacteria were considered resistant if the inhibition diameter reached as indicated by the indicator In the standard specifications mentioned in (CLSI 2013).

### Testing of Interference between Natural and Antimicrobial Materials

The interference test between the antibiotics under study with the natural substances (sesame oil, royal Jelly and olive oil) was performed for bacterial isolates, depending on the method [21], and then put 10μl of sterile sesame oil in pasteurization, and then incubated the dishes at a temperature of 37°C for a period of 18-24 hours and the diameter of the inhibition zone of the antibiotic with sesame oil was measured. and the same treatment was repeated with olive oil as well as royal jelly separately.

### The Statistical analysis

The statistical analysis of the statistical package of

social sciences-Version-22 (SPSS).

## Results

The results showed the isolation and diagnosis of *Klebsiella spp*. With a rate of (17.5%) of the number of isolates by 7 isolates, which are Gram negative bacteria, the *Klebsiella spp*. isolates were distinguished Which was isolated by the fact that its colonies are large in size and with mucosal shape due to they contain capsule, They are pink on the MacConkey medium for their ability to ferment the lactose sugar and are non-moving bacteria, positive for the Urease and Catalase tests as well as for the vogas- Proskauer, , And for the test of the indol, methyl red and the oxidase, they are negative and non produce hydrogen sulfide.

*Klebsiella* isolates showed resistance to (Ciprofloxacin, Trimethoprim-Sulfamethoxazole, Amoxicillin / Clavulanic acid, Ceftriaxone) were 100% and the resistance ratio of ( Gentamicin, Amikacin and Nitrofurantion ) was 85.7% for each antibiotics.

The results of the statistical analysis showed significant differences at the level of probability ($P \leq 0.05$). The results showed that the overlap of natural substances (sesame oil, olive oil, royal Jelly) with the antibiotics under study has a special role in increasing the sensitivity of antibiotics.

The results of the interaction of the antibiotics with the natural substances used showed significant differences in all antibiotics discs. The results of the Ciprofloxacin interaction showed significant differences, especially the increase in synergy with the royal Jelly. The rate of inhibitory diameter of the antibiotic disc was increased after its synergy with the royal Jelly compared to the standard of (4 mm) to 7.28 mm. Ciprofloxacin with both sesame oil and olive oil was increased for inhibition compared with the standard (5.14 mm and 4.85 mm) respectively, From 6.14 mm to 9.1 4 mm) compared to standard when synergistic with royal Jelly, as shown in the table 1.

**Table 1: interaction of the antibiotics with the natural substances**

| P value | Synergistic antibiotic with natural substances | | | Control ( antibiotic only ) | Antibiotics |
|---|---|---|---|---|---|
| | Royal Jelly | Olive oil | Sesame oil | | |
| 0.002* | 7.28 | 4.85 | 5.14 | 4 | Ciprofloxacin |
| 0.029* | 12.14 | 13 | 12.57 | 12.57 | Amikacin |
| 0.043* | 9.14 | 8 | 6 | 6.14 | Augmentin |
| 0.006* | 2 | 2.71 | 2.85 | 1.71 | Trimethoprim-Sulfamethoxazole |
| 0.006 | 11.42 | 14.42 | 13.57 | 13.42 | Nitrofurantion |
| 0.000* | 5.85 | 4.57 | 3.14 | 3.71 | Ceftriaxone |
| 0.006* | 10.28 | 10.57 | 10.42 | 10.28 | Gentamicin |

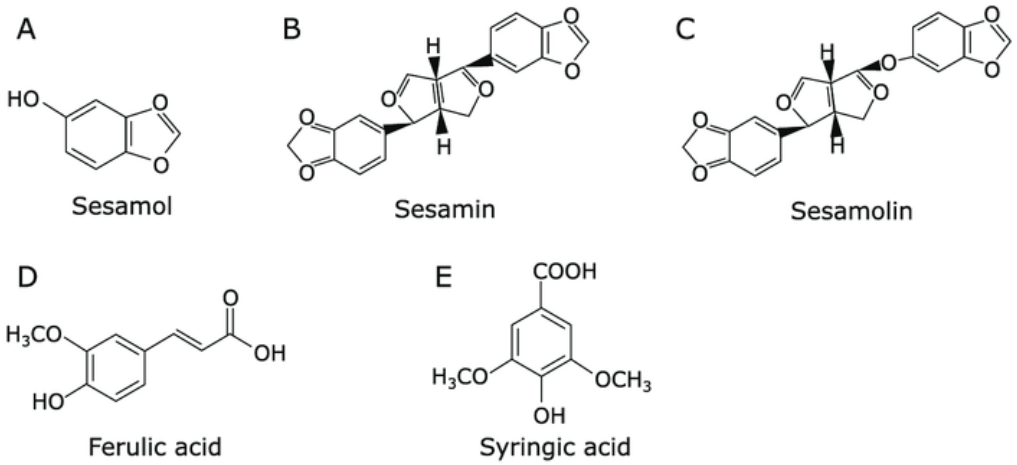
* Significant difference at a level below (0.05)

The results showed that there is a significant difference in the sensitivity of the isolates to the antibiotics alone, on the one hand, and the change of sensitivity in the use of antibiotics with natural substances on the other, due to the synergistic act between the natural substances and antibiotic.

The results of this study agree with what he found[22], which showed that the synergistic action affects the resistant and sensitive bacteria. The synergistic effect has a significant impact on the resistant and sensitive species and in percentages that may vary depending on the species. The synergy of natural substances and antibiotics reduces antibiotic resistance and also cooperates with antibiotics in the killing of bacteria [23] as confirmed in their study.

The results of the present study are consistent with what is found [24] in increasing the sensitivity of bacterial isolates to antibiotics mixed with honey, indicating the synergistic action between them.

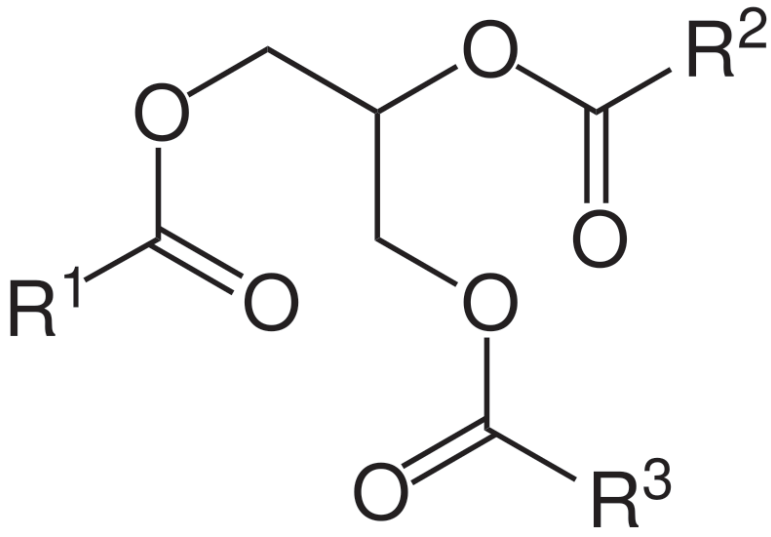
And the current study is consistent with[25] what found sesame oil shows different therapeutic characters , which indicates its antibacterial properties on Enterobacteriaceae .




Sesame oil contains phenolic groups capable of binding or depositing water soluble proteins. This disrupts the cell function and causes the cell to stop functioning by inhibiting enzymes, destroying the plasma membrane[26].

It can be said that the use of this extract will be a natural substance that provides the body with important compounds as well as the inhibitory effect of pathogenic Klebsiella bacteria when used by patients and this was the main purpose of using this extract against bacteria[27].

Our results are in concordance with those reported by[28] and[29], who observed higher activity in olive oils . The authors attributed this activity of olive oil to the phenolic compounds; the dialdehidic form of decarboxymethyl oleuropein and ligstroside aglycons, hydroxytyrosol, and tyro-sol were the phenolic compounds.




Phenolic products consisting of polyphenol, flavonoids, and tannic acid have been reported to have satisfactory antibacterial activity against food-borne pathogens[30].

Khan[31] has shown that many phytochemicals have an inhibitory effect on a wide range of microorganisms that have been used as drugs such as alkaloids, soapins, flavonoids and polyphenols.

The mechanism of action of these compounds is not clear, but there are studies indicating that these compounds enter the cell and interfere with the process of cellular metabolism, while other studies indicated that phenols (Carvacrol and Eugenol), Disturb the cell membrane and thus reach the effective site in the Enzyme[32].

Fatty acids and monoglycerides found in olives have been found to have a wide range of killer activity of microbes against bacteria and yeasts[33].

As indicated by[34], who indicated in his results that the inhibitory effect is most likely associated to lipid-containing molecules present in ether soluble fraction of royal jelly. The weaker antibacterial activity in ether-non-soluble fraction of royal jelly may be attributed to royalisin which is a portion of the ether-non-soluble fraction of royal jelly[35].

Studies on raw royal jelly have shown that because of its antimicrobial properties it can inhibit the growth of several types of microbes, including MRSA. In addition, the synergistic effect of mixing royal jelly with other products, such as honey, significantly improves antibacterial activity against dangerous pathogens such as *Staph. aureus*,*P. aeruginosa* [36,37].

## Conclusions

Natural substances under study have a significant effect on increasing the effectiveness of antibiotics against *Klebsiella* spp. Royal jelly is most effective in increasing the efficacy of antibiotics, especially the antibiotic Ciprofloxacin.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

## Funding: Self-funding

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# Assessing the Response of a Sample of Iraqi Asthmatic Patients to Different Medication Regimens

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## Abstract

Asthma is a chronic inflammatory disease of respiratory airways characterized by distinctive history of respiratory symptoms due to variable airflow obstruction which reverses either spontaneously or in response to certain medications. Acetylcholine is a parasympathetic neurotransmitter which plays fundamental roles in the development of persistent asthma. Treatment guidelines recommend using medium doses of inhaled corticosteroids in addition to another controller bronchodilator instead of using high doses inhaled steroid alone for treatment of moderate to severe persistent asthma. The inhaled long acting muscarinic antagonist, tiotropium, was approved recently to control unresponsive asthma to inhaled corticosteroid with or without a long acting β-2 agonist. The aim of this study was to assess and compare the responses of a sample of Iraqi asthmatic patients to three different medication regimens.

***Key words:*** *Persistent asthma, Medication regimens, Tiotropium*

## Introduction

Asthma is a disease characterized by chronic inflammation of respiratory airways causing the distinctive history of variable respiratory symptoms which include wheezing, shortness of breath (SOB), cough and chest tightness due to variable airflow obstruction which reverses either spontaneously or in response to certain medications [(1)].

Acetylcholine (ACh) is a parasympathetic neurotransmitter and plays principle roles in the development of chronic or persistent asthma via multiple types of muscarinic receptors resulting in enhancement of inflammatory mechanism, mucus hypersecretion, bronchial lumen narrowing and remodeling of respiratory airways [(2)].

Two important terms are used in the assessment of asthma; the first being severity which is concerned with describing disease process and is used primarily when initiating treatment, whereas the term control is a dynamic tool concerned with describing the response of patients to therapy depending on the efficacies of the prescribed therapeutic agents [(3)].

The level of asthma control during the previous four weeks can be assessed by asthma control test (ACT) questionnaire which involves five questions with answering score ranges from one which means worst control to five which means best control [(4)]. A change of three points in the total score of ACT is considered minimal clinically important difference (MCID) [(5)]. Pulmonary function test (PFT) maneuver is a valuable non invasive procedure for measuring airway caliber of both large and small airways [(6)].

Inhaled corticosteroids (ICS.s) are the cornerstone anti-inflammatory medication indicated alone or in combination with other controllers for controlling all severities of persistent asthma. Treatment guidelines recommend using medium doses of ICS in addition to another controller bronchodilator instead of using high doses of ICS monotherapy for long term control of moderate to severe persistent asthma [(7)]; long acting β-2 agonists (LABAs), formoterol and salmeterol, are the first line bronchodilator indicated for this purpose, but reduced responsiveness due to tachyphylaxis limits their prolonged use [(8)].

The recent addition to the list of maintenance treatment of persistent asthma is the inhaled long acting muscarinic antagonist (LAMA), tiotropium, which was approved to control unresponsive asthma to ICS with or without a LABA [9]. The aim of this study was to assess and compare the responses of a sample of Iraqi asthmatic patients who reside in Baghdad, Capital of Iraq, to three different medication regimens.

## Patients and Methods

### Patients

This study was designed as a prospective interventional open label randomized clinical study to evaluate the clinical efficacies of three medication regimens assigned for Iraqi patients with persistent asthma. The study was conducted in 2 sites located in Baghdad, Capital of Iraq, fromSeptember-2018 till June-2019. These sites were the respiratory clinic of Dowaly Private Hospital and AL-Zahra Center of Asthma and Allergy.

The inclusion criteria were: age between 18 and 70 years, current status of poorly controlled or uncontrolled moderate - severe persistent asthma according to diagnosis of the specialist physician, baseline forced expiratory volume in one second (FEV1) of 40-80 % of predicted values and patient being nonsmoker or previous smoker of less than 10 pack years who stopped before at least a year.

Meanwhile, patients should devoid of the following exclusion criteria: pregnancy or lactation for female patients, concurrent serious respiratory or cardiac disease, use of any maintenance asthma controllers within 4 weeks of enrollment visit and respiratory tract infection or use of systemic corticosteroids within the previous 4 weeks of the baseline visit.

Patients were allocated randomly to one of three groups according to the type of treatment regimen being studied:

**First group:** Combination of budesonide 160 µg and formoterol 9 µg **(Bud/For)** per inhalation of dry powder inhaler (DPI): dose was two inhalations every 12 hours

**Second group:** composed of budesonide 200 µg per inhalation of DPI and oral modified release aminophylline 225 mg tablets **(Bud/Ami)**: dose of budesonide was two inhalations every 12 hours, while dose of aminophylline tablets was a single tablet every 12 hours after meals.

**Third group:** composed of budesonide 200 µg per inhalation of DPI and tiotropium capsule containing 18 µg of dry powder intended for oral inhalation **(Bud/Tio)**: dose of budesonide was two inhalations every 12 hours, while that of tiotropium was a single capsule inhaled at evening

All patients were allowed to continue their use of salbutamol metered dose inhaler (MDI) when needed for reliving the acute attacks of asthma symptoms.

## Method

The duration of current study was 8 weeks and involved 3 visits: baseline or enrollment visit, first follow up visit 4 weeks after the baseline one and second follow up visit after additional 4 weeks.

Pulmonary function test procedure was performed and ACT values were recorded in each visit. Patients were instructed to perform PFT under the supervision of a well-trained technician for three times and the device recorded the best result automatically.

## Statistical Analysis

Discrete variables were presented using their numbers and percentages, whereas continuous variables were presented using their means ± standard deviation (SD). Discrete variables were analyzed using Chi square test or Fisher-Freeman-Halton exact test.

Trend ANOVA was applied to analyze the differences of means within each studied group over three visits (baseline, first follow up and second follow up visits) using the means of values measured in each visit, while One way ANOVA was used to test the differences among the groups using the means of values in the baseline visit and then means of changes of values (increment or decrement) produced during the first and second four weeks of study.. Thereafter, if the general comparison showed significant differences, post Hoc Tukey test was applied to test the significance difference between each pair of means.

Statistical Package for Social Sciences (SPSS) version 23.0.0 (Chicago, IL), GraphPad Prism version 8.0.0 for Windows, GraphPad Software, San Diego, California USA, software package was applied to conduct the statistical analysis. The level of difference

was chosen to be significant when p value was less than 0.05

## Results

This study recruited 78 patients. Fourteen patients terminated the treatment regimens prematurely due to different causes with subsequent exclusion of their data, while those who completed it were 64 patients; 21 patients in the first and second group and 22 patients in the third group. Socio-demographic data of patients were matched across the studied group; patients were older than 40 years in the first group. The first and second groups showed slight male predominance. Patients in all groups were overweight and their BMI values were between 25 and 30 kg/m$^2$. Nearly two thirds of patients were urban and one third was rural. About 70% of patients were nonsmokers and the majority of them were unemployed. Educational status showed higher ratio of secondary level.

The FEV1 values were increased after initiating study in all groups; medication regimens caused significant increases of measured FEV1 values in first follow up visit compared to baseline one. Both first and third groups developed further significant increase of FEV1 values measured in the second follow up visit in comparison with first follow up values (p<0.001), unlike the second group which showed a non-significant decrease of FEV1 values in second follow up visit compared to first follow up one (p=1.0) as presented in table-1

**Table-1: Effects of medication regimens on FEV1**

| **Group** | **First group (Bud/For)** | **Second group (Bud/Ami)** | **Third group (Bud/Tio)** | **p-value** |
|---|---|---|---|---|
| Number of patients | 21 | 21 | 22 | - |
| FEV1 (Liters) | | | | |
| Baseline | 1.6±0.3 | 2.0±0.5 | 2.1±0.6 | <0.01a |
| First follow up (After 4 weeks) | 1.9±0.3 * | 2.4±0.6 * | 2.6±0.6 * | <0.001a |
| Second follow up (After 8 weeks) | 2.2±0.3 *,¥ | 2.3±0.4 * | 2.9±0.7 *, ¥ | <0.001a |
| p-value | <0.001b | <0.001b | <0.001b | |

FEV1: Forced expiratory volume in one second
a: One way ANOVA

b: Trend ANOVA (repeated measure ANOVA)
*: significant difference compared to baseline values
¥: significant difference compared to first follow up values

Between groups analysis according to extent of FEV1 improvement revealed that third group developed significantly the largest improvement compared to other two groups during the first four weeks of study (p<0.001), while no significant difference was noted between first and second groups (p=0.71), as shown in figure-1

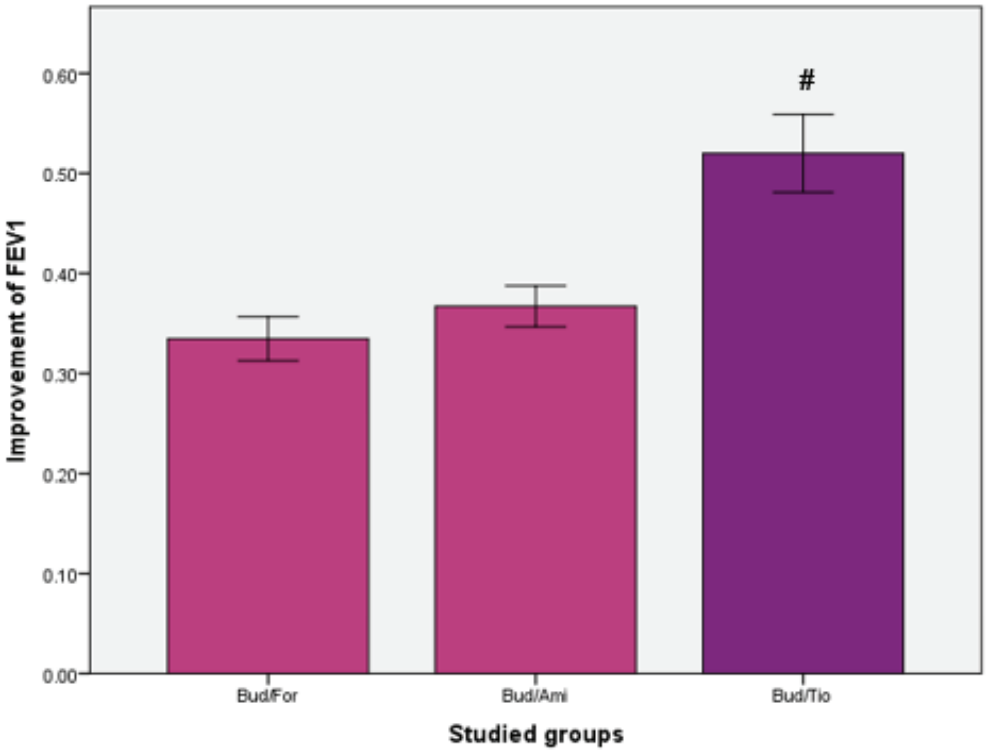


**Figure-1: Extent of FEV1 improvement during the first four weeks of study**

#: significant difference compared to other groups

The magnitude of FEV1 improvement during the second four weeks of study produced in first and third groups was significantly better than that produced in second group ($p<0.001$), while it was not significantly different between first and third groups ($p=0.93$) as shown in figure-2.

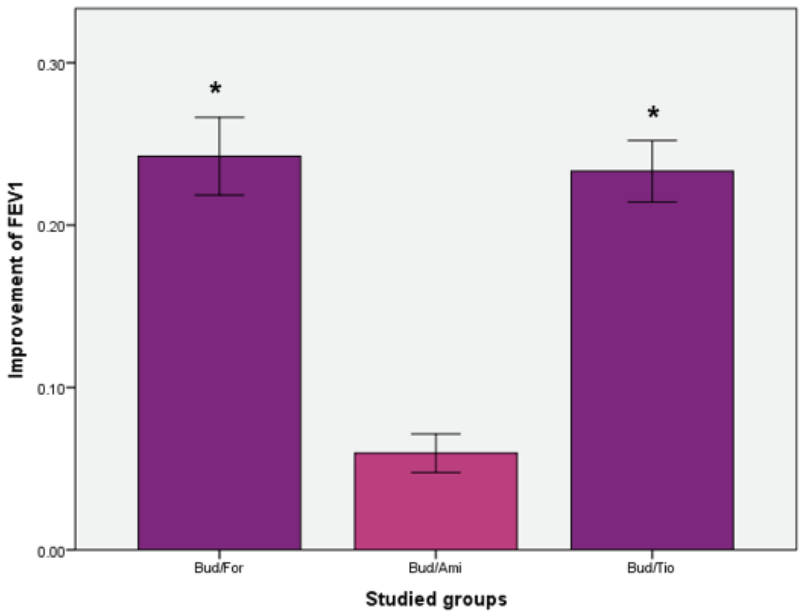


**Figure-2: Extent of FEV1 improvement during the second four weeks of study**

*: significant difference compared to second group

In all groups, treatment regimens caused significant improvement of ACT scores after 4 weeks of administration compared to pretreatment values (p<0.001). Studied groups continued the improvement and developed significant higher scores of ACT in the second follow up visit in comparison with first follow up scores (p<0.001) as illustrated in table-2.

**Table-2: Effects of medication regimens on ACT scores**

| **Group** | **First group (Bud/For)** | **Second group (Bud/Ami)** | **Third group (Bud/Tio)** | **p-value** |
|---|---|---|---|---|
| Number of patients | 21 | 21 | 22 | - |
| ACT scores | | | | |
| Baseline | 11.5±2.0 | 11.1±2.2 | 10.8±1.5 | 0.433 a |
| First follow up (after 4 weeks) | 17.0±1.3 * | 16.6±2.0 * | 17.4±1.1 * | 0.011 a |
| Second follow up (after 8 weeks) | 21.0±1.4 *, ¥ | 18.5±2.5 *, ¥ | 21.3±1.9 *, ¥ | <0.001 a |
| p-value | <0.001b | <0.001b | <0.001b | |

ACT: Asthma control test
a: One way ANOVA
b: Trend ANOVA (repeated measure ANOVA)
*: significant difference compared to baseline values
¥: significant difference compared to first follow up values

Comparison between studied groups based on extent of ACT scores increment during the first four weeks of study demonstrated that third group produced the largest significant increment compared to other two groups (p=0.024), while the first and second groups developed nearly equal extents of increment (p=1.0) as presented in figure-3

During the second four weeks of study, the first and third groups produced larger significant extent of ACT scores increment compared to second group (p<0.001) with non-significant difference between them (p=0.99) as shown in figure-4

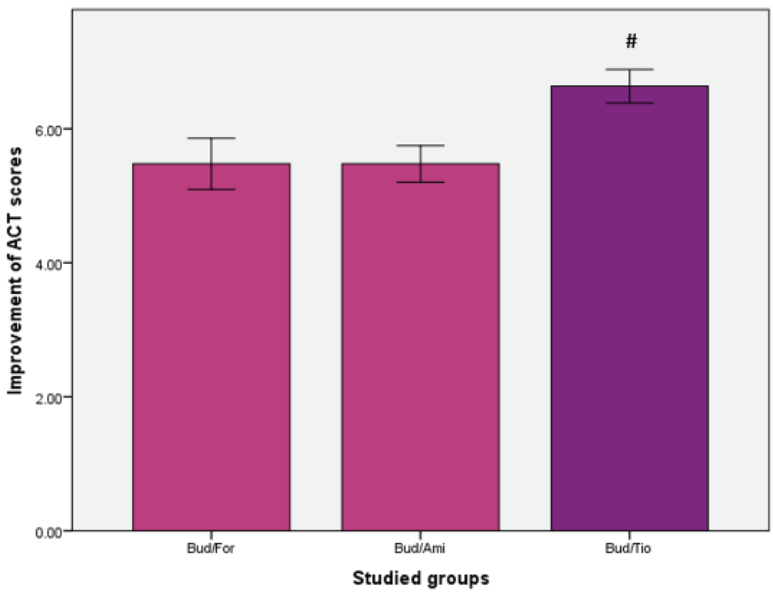


**Figure-3: Extent of improvement of ACT scores during the first four weeks of study**

#: significant difference compared to other groups

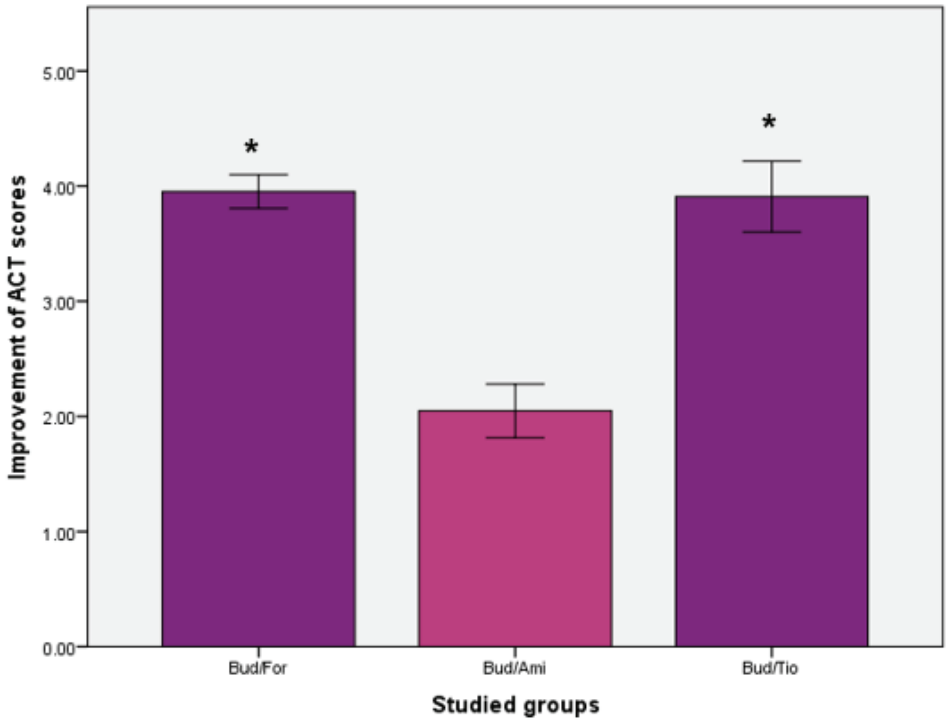


**Figure-4: Extent of improvement of ACT scores during the second four weeks of study**

*: significant difference compared to second group

## Discussion

The doses of budesonide inhaler used in studied groups of the present study were chosen to be equivalent in the medium range of 640-800 µg per day [10]. Therefore, the differences in clinical efficacies among the studied groups may be attributed to the second controlling medication which was combined with inhaled budesonide in each group, while the clinical efficacies within each group after initiating medication regimens in comparison with pretreatment status may be attributed to both components of studied regimens.

The FEV1 is a very important parameter for assessing the response of respiratory airways to bronchodilator medications indicated for long term maintenance of asthma [11] and it is obvious that the principle mechanism of action of the second medication combined with budesonide in each group of this study was bronchodilation

Zhang *et al*, noted that after 8 weeks of adding either tiotropium or LABA to asthmatic patients inadequately controlled on corticosteroid inhaler alone produced significant increment of FEV1 compared to pretreatment values. They also noted that despite the non-significant difference between these two controllers, tiotropium produced higher FEV1 increment (0.73±0.31) than LABA (0.68±0.26) [12]. This finding highlights the primary role of parasympathetic transmission in affecting asthma through its effects especially on airway patency despite the abundance of β-2 receptors in respiratory airways.

The results of the current study were consistent with those observed by Adachi *et al*, who conducted a double blind randomized study to assess the clinical outcomes of two treatment regimens; the first was ICS/salmeterol combination and the second was ICS plus prolonged release oral theophylline for 8 weeks in adult Japanese patients having persistent asthma. The ICS/salmeterol group showed continuous progressive increment of FEV1 at 4 and 8 weeks, while the ICS/theophylline group showed initial improvement of FEV1 during the first 4 weeks followed by decrement to baseline values during

the second 4 weeks. At the 8th week, the FEV1 change of the salmeterol group was significantly higher than the FEV1 change of theophylline group [13]. This finding supports the fact that locally administered medications by inhalation route produced more powerful effects on airways diameter than systemically administered ones.

In agreement with this study, Zhang *et al*, found that after 8 weeks of allocation to the studied treatment combinations, the ICS/tiotropium significantly improved the ACT scores from 14.4±2.41 (uncontrolled status) at baseline visit to 23.3±2.92 (controlled status). Similarly, ICS/salmeterol regimen significantly increased the pretreatment ACT scores of 12.6±2.2 (also uncontrolled) to reach 22.1±2.46 (controlled status). The magnitude of ACT improvement was not significantly different between these two medication regimens [12].

Wang *et al*, assessed the clinical outcomes of oral theophylline (400 mg daily) administered with fluticasone aerosol (500 µg daily) versus combined salmeterol and fluticasone (100/500 µg daily) in patients with moderate to severe persistent asthma for 12 weeks. Before treatment, the ACT scores were 17.09±3.837 and 16.24±3.936 in the theophylline/ICS and LABA/ICS respectively. Both medication regimens produced significant improvement of ACT scores after weeks of regular administration compared to baseline scores (20.39±3.43, 19.81±4.37 in the theophylline/ICS and LABA/ICS respectively). The changes in ACT scores brought about by these two regimens were not significantly different between them [14].

**Limitations of study**

1- The design of study did not involve blinding or enrollment of placebo group

2- The study recruited small sample size and was conducted at only two center in Baghdad

3- Duration of study was relatively short which did not allow for assessing the effects of treatment regimens on rate of asthma exacerbation as well as long term safety profile

**Conclusions and recommendation**

1. All studied group caused significant improvements in FEV1 and ACT scores in comparison with baseline values.

2. Patients who received inhaled tiotropium/ICS were associated with the best significant improvement of study parameters followed by those treated with inhaled formoterol/ICS and finally the group allocated to oral long acting aminophylline tablets/ICS developed the least extents of improvement

**Acknowledgement:** Great thanks and appreciation to the specialist physician, Ibtisam S. Hassan Zwaylif, for her great and valuable role in clinical evaluation of patients.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# Experimental Study of Prepared Killed Vaccine For *S. Aureus* in Local Rabbits

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## Abstract

This study was performed to estimate the *S. aureus* prepared killed vaccine in rabbits. The isolate of *S. aureus* that used in the present study were obtained from the college of veterinary medicine, University of Fallujah which were confirmed by using gram stain and other biochemical tests. A total of 30 local rabbits were used in this study, these were divided into 3 groups, each group contain 10 rabbits, the group 1 used as control negative, group 2 given 1 ml antigen contained 20 mg according to the pilot study that performed, group 3 serve as control positive. At day 21 post-immunization, a skin test was done, at the day 28 post first immunization, the rabbits of group 2 and 3 were challenged intra peritoneal with (1ml) of bacterial suspension containing $1\times10^8$ cfu/ml of viable virulent *S. aureus*. At day 33 post immunization, the rabbits were sacrificed then postmortem examination was carried out to all sacrificed rabbits, pieces from internal organs (liver, spleen and kidney).

The results showed that all animals in G2 showed positive reaction after 24 and 48 hrs. for skin test, the result of bacterial isolation after challenge with virulent *Staphylococcus aureus* showed the isolation of heavy bacterial isolation in control positive group from different organs of body, while immunized groups showed significant decrease in bacterial isolation as compared with control positive. The result of histopathological study of G2 showed PMNs infiltration in liver, spleen and kidney, with vacuolar degeneration of epithelial lining the renal tubule, also, the spleen showed hemorrhage, congestion of red pulp.

In conclusion, the killed vaccine that prepared showed a higher effectively when given to the rabbits; furthermore in our conclusion some bacteria were spread from the site of inoculation toward internal organs and during the course of the experiment, activated macrophages engulfed and destroyed most of them.

***Key words:*** *killed, S. aureus, ra*bbits.

## Introduction

It is a major pathogen in both community-acquired and nosocomial infections [(1)]. Many studies have reviewed the clinical infection of Staphylococcus infection which considered to be the 2nd most public cause of wound infection after *E. coli* .The wide spread use of antibiotics has led to result in multiple resistance strains [(2)].

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*Staphylococcus aureus* is regarded as a main pathogen for humans as well as animals importance due to the rise in antibiotic resistance being a highly adaptable organism, it has the ability to create infections in a wide-ranging in most body positions. The type of infections which caused by this species were to be frequently acute and pyogenic, if untreated may transmit to the adjacent deeper tissues or organs, may result in spread or deep-seated infections which are life threatening [(3)].

The important of this strain was due to multiple drug resistance as reported by [(4)].

Different type of *S. aureus* antigens were used previously as a vaccine but these Ags produced partial protection [5], however, Increasing of *S. aureus* resistance to the latest line of drugs, which is vancomycin may places of interest for seeking a new as well as novel antibiotics [6].

To this time the vaccine for *S. aureus* till unavailable to encourages the active immunity against infections from result from this bacteria [7].

A study designed to investigate the clumping factor as well as FnBPA for *S. aureus* as a vaccine, the authors showed a highly immunogenicity of the vaccine with a significant protection in mice [8].

A vaccine was developed which would offer protection against a wide-ranging of *S. aureus* strains and possibly other gram +ve bacteria. The use of peptidoglycan was studied, because it is the structure which has been exposed to play a main part in the opsonic recognition of Staphylococcal and also has a huge ability to activate both the classical as well as the alternative pathways for human complements [9].

The aim of current study was to estimate the *S. aureus* prepared killed vaccine in rabbits.

## Materials and Method

**Strain of *S. aureus*:**

The isolate of *S. aureus* used in this study were obtained from the college of veterinary medicine, university of Fallujah. This strain was ensured by using many tests including gram stain as well as the biochemical tests according to [10].

**Preparation of killed antigen:**

*Staphylococcus aureus* cultured on brain heart infusion agar, then incubated at 37 °C for 24 hrs., the harvesting was done by using PBS 7.2, then centrifuged at 3000 rpm for thirty minutes then washed for 3 times with sterilized PBS, and the precipitate was re-suspended by using PBS. This suspension were heated till boiling and then cultured on agar to ensure that the bacteria killed and preserved till used.

**Laboratory animals:**

Thirty (30) local breed healthy rabbits male and female were used in the present study. They were fed on pellet and green grass ad libitum. They were reared for two weeks for adaptation, these were divided into two groups:

G1: this include 10 rabbits were used as control negative.

G2: this include 10 rabbits and used as treated group which given 1 ml antigen contained 20 mg according to the pilot study that performed.

G3: this include 10 rabbits which serve as control positive

At day 21 post-immunization, a skin test was done according to [11]. At day 28 post first immunization, the rabbits of groups 2 and 3 were challenged intra peritoneal with (1ml) of bacterial suspension containing $1\times10^8$ cfu/ml of viable virulent *S.aureus* [12].

**Histological examination:**

At day 33 post immunization, the rabbits were sacrificed then postmortem examination was carried out to all sacrificed rabbits, 1 cm pieces from the internal organs (liver, spleen & kidney) were taken for bacterial isolation on Nutrient, blood, mannitol salt agars and other pieces were fixed in 10% formalin at (72)hrs. for histological examination which is done according to [13].

**Statistical analysis:**

This is done by using SPSS software according to [14].

## Results and Discussion

All animal in G2 showed a positive reaction after 24 and 48 hours of skin test, this positive reaction represented by presence of a circular erythema and increasing skin thickness against used Ag, the control groups give negative reaction (erythema & thickness) (Table 1).

**Table (1) Mean values of skin test in immunized Group (G2)**

| Animal No. | Erythema Diameter (cm) | | Skin Thickness( mm) | |
|---|---|---|---|---|
| | 24 hrs | 48hrs | 24hrs | 48hrs |
| 1 | 2.3 | 1.3 | 9.2 | 5.1 |
| 2 | 2.4 | 1.2 | 8.3 | 4.4 |
| 3 | 1.7 | 0.9 | 7.1 | 4.7 |
| 4 | 2.4 | 1.8 | 9.8 | 3.8 |
| 5 | 2.0 | 1.5 | 8.4 | 5.4 |
| 6 | 2.3 | 1.3 | 8.7 | 4.2 |
| 7 | 2.1 | 1.1 | 7.9 | 5.1 |
| 8 | 1.8 | 0.9 | 6.8 | 3.4 |
| 9 | 1.8 | 1.0 | 7.0 | 4.6 |
| 10 | 2.6 | 1.4 | 10.2 | 5.9 |
| Mean ± SE | 2.2±0.14 a | 1.4±0.26 a | 8.1±0.55 b | 5.40±0.22 c |

In the skin test, remaining macrophages in the skin epidermis collect the supernatant $Ag_s$ that pass from the skin and carrying into the local lymph nodes, where T-cells are activated by Ags and rapidly differentiate to Th-1 cells, which produce various cytokines and chemokine's like IL8, so that macrophages and other cells are activated and attracted to the site of skin test [15].

All rabbits in G2 gave different reaction this is due to the different degrees of immune response the same results were recorded by [16]. In general positive reaction of all Ags refer the ability of smooth strains to give immune response higher than rough strains due to their consisting of O-side chain [17].

The result of bacterial isolation after challenge with virulent *Staphylococcus aureus* showed the isolation of heavy bacterial isolation in control positive group from different organs of body, while immunized groups showed significant decrease in bacterial isolation as compared with control positive (Table 2).

**Table (2) Bacterial isolation from the internal organs of groups animals infected with virulent *S.aureus* at day 33 showed number of colonies in 1gm from each organs**.

| **Group of animal** | **Spleen** | **Liver** | **Heart** | **Kidney** |
|---|---|---|---|---|
| G3 | 42 | 49 | 23 | 26 |
| G1 | 0 | 0 | 0 | 0 |
| G2 | 1 | 1 | 0 | 0 |

O'Riordan and Lee [18] explained that the phagocytic response of PMNs is the body's first line of defense against invasion by *S.aureus* and critical determinant in the outcome of staphylococcal infections.

These findings indicated that some bacteria were spread from the site of inoculation toward internal organs and during the course of the experiment, activated macrophages engulfed and destroyed most of them. This evidence was consent with several previous studies that explained the opsonization of *S.aureus* is critical for

uptake and killing of bacteria by professional phagocytic cells, complement and Abs, are the principle serum opsonin and had been shown to play an important role in opsonophagocytic killing to *S.aureus* [19].

The result of histopathological study of G2 showed few number of leucocytic infiltration and small amount of fibrin deposition in the liver (Fig. 1), there's also PMNs infiltration with vacuolar degeneration of epithelial lining the renal tubule (Fig. 2). The spleen showed hemorrhage, congestion of red pulp as well as neutrophilic infiltration (Fig. 3).

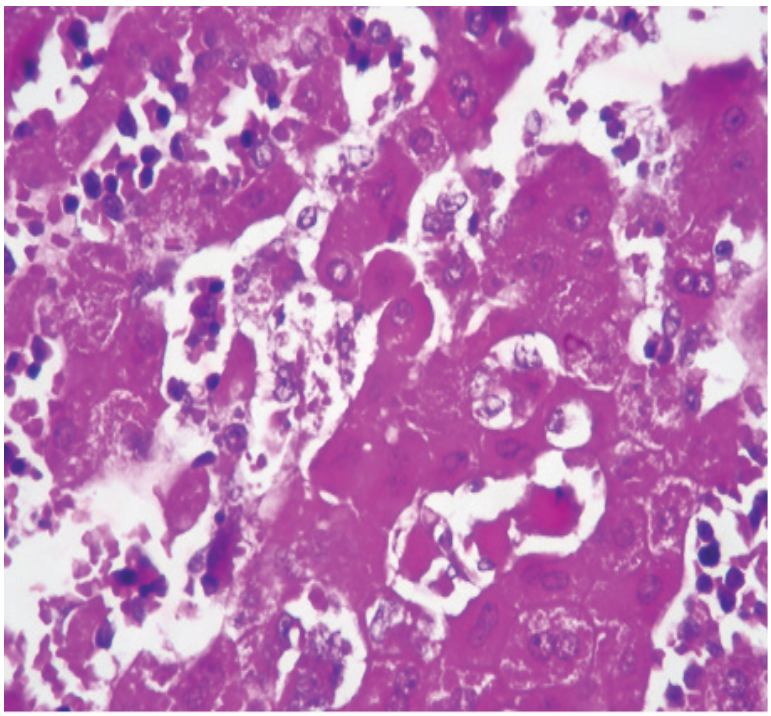

**Figure (1). Histological section in the liver of immunize group with killed *S. aureus* Ag showed few number of PMN leucocyte infiltration (H&E stain X40) .**

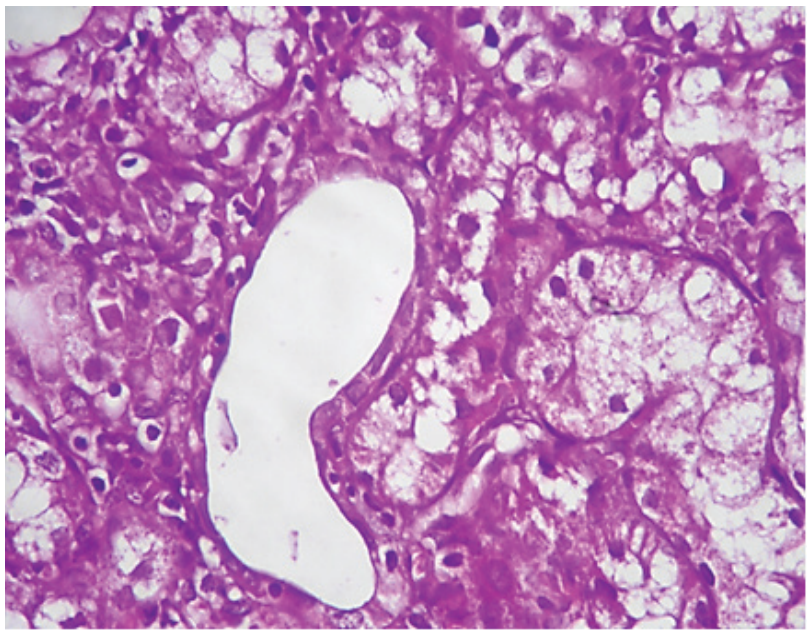

**Figure (2). Histological section in the kidney of immunize group with killed *S. aureus* Ag showed neutrophilic infiltration and vacuolar degeneration of epithelia lining of renal tubules (H&E stain X40).**

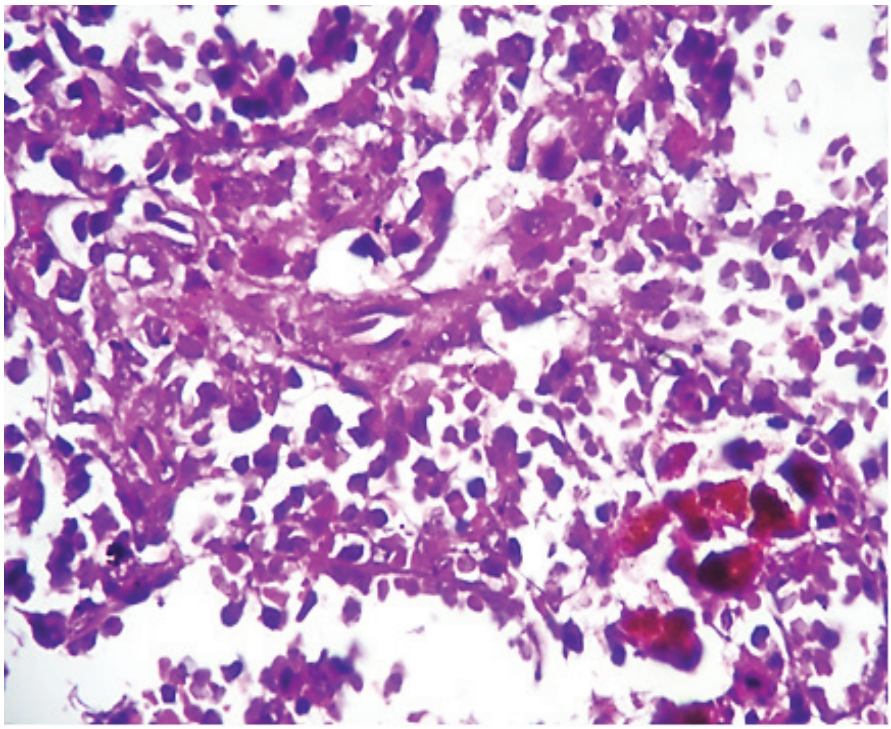

**Figure (3). Histological section in the spleen of immunize group with killed** *S. aureus* **Ag showed hemorrhage and congestion of red pulp and neutrophilic infiltration. (H&E stain X40) .**

The liver was the most affected organ, spleen, kidney, this is may be due to the nature of the function of the liver which mention nutritional metabolic balance in the body and this include all nutrient material and the liver considered to be the important filter which play potential role in elimination of toxins, body waste protected, metabolic substance and other foreign materials including pathogens more over the liver is major organ depended in portal circulation. These mean that all hard substance cross through the liver tissue [(20)].

The present neutrophils infiltration in organs of tissue included in this study the higher proportion of this infiltration in group 2 may related to the active production of TNF-α which proximal mediator of neutrophils chemo tactic factor [(21)] and related also to the fact that is the neutrophil represent essential cells for host define [(22)], neutrophil also can produce pro inflammatory mediators such as IL-12 [(23)].

In conclusion, the killed vaccine that prepared showed a higher effectively when given to the rabbits; furthermore in our conclusion some bacteria were spread from the site of inoculation toward internal organs and during the course of the experiment, activated macrophages engulfed and destroyed most of them.

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest**: The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# Evaluation of Serum Leptin Level in Correlation with CRP in a Sample of Iraqi Patients with Inflammatory Bowel Disease at Gastroenterology and Hepatology Teaching Hospital

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## Abstract

**Introduction:** adipocytokines display avital role in inflammation and metabolism, body metabolism changes in inflammatory bowel disease (IBD) and chronic inflammation conceder the pathognomonic of this disease, s. leptin and C-Reactive protein (CRP( in patients with active disease either Crohn disease or ulcerative colitis. The aim of this descriptive study is to evaluate the serum leptin and CRP level in a sample of Iraqi patients with IBD of variable disease activity index. **METHOD:** serum concentration of leptin was studied in 79 patients diagnosed as IBD [41 patients diagnosed as Crohn's disease (CD) and in 38 patients diagnosed as ulcerative colitis (UC)]. The diagnosis based on colonoscopy, CT, MRI, US and histopathological examination of mucosa. Serum leptin and CRP was measured by an indirect ELISA. Leptin level was compared with CRP and correlated with disease activity. **RESULTS:** data showed that out of 38 patients diagnosed as UC, 10 (26.3%) were in remission, 22 (57.9%) were in moderate activity, and 6 (15.8%) have severely active disease. On the other hand, out of 41 patients diagnosed as CD, 17 (41.5%) were in remission state, 20 (48.8 %) have moderate active disease, and 4 (9.8%) have severely active form. Serum leptin in the UC group was significantly associated with disease activity in an inverse pattern ($p$ = 0.045), while no significant association between action index in patients with Crohn disease and leptin level P-value = 0.77. While CPR level have significant association with ulcerative colitis patients P-value = 0.017 and with Crohn disease P-value = 0.043.Comparing both CRP and leptin level showed significant association with UC as an overall effect and those in decrease only (P-value = 0.047, 0.029 correspondingly), while this association was only significant as an overall effect for CD group P-value = 0.043. **conclusion:** a significant association between disease activity in UC and CD with serum CRP. Comparing both CRP and leptin level showed that there is an overall significant association with both UC and CD, but not useful for defining their activity index.

***Keys words:*** *serum leptin, CRP, Iraqi patients, inflammatory bowel disease, Hepatology Teaching Hospital.*

## Introduction

Inflammatory bowel disease (IBD) can divided into two types Crohn's disease and ulcerative colitis, it define as chronic immune disease inflammatory in nature of gut, incidence of it very universally [(1)]. Unclear pathophysiological mechanism but with many studies they recommends a multifactorial causes [(2)], some studies connected it with nature of food consumption, high energy loss and decrease absorption of food and minerals [(3)]. CD with features of weight loss and loss of appetite during acute stages of inflammation [(4-7)]. Traditionally, management of IBD was mainly depended on the presenting symptoms such as abdominal pain, bowel habits, and general well-being. Symptomatic treatment, however, may not improve long-term results or slow disease progression[(8)]. CRP used as substitute indicators of endoscopic IBD action, it conceders one of many plasma proteins that have significant action in serious stage of inflammatory action [(9)], it created in the hepatocytes and also extra-hepatic also been established [(10,11)]. CRP half-life is 19 hours and the level of it decrease quickly when acute phase end, so conceder vital sign of inflammation [(12)]. CRP action

independent in physiological and pathological situations so CRP produced by liver conceder a single agent so it is important factor to diagnosis and screen CD patients [12]. Leptin from the Greek word leptos, meaning 'thin' was first proposed in 1953 that it could be a marker of fat tissue regulation[13], later Zhang et al isolated the leptin hormone in 1994 [14]. It have important function to food intake rule, energy spending, and body weight, its receptors are expressed in a variety of tissues [15]. Leptin is considered a multi-task hormone [16], as well as an important regulator of inflammation [17]. Some of its immunological tasks includes increasing the synthetic activity and chemotaxis of macrophages and monocytes, induces the proliferation, activation and maturation of natural killer cells. Besides, leptin has non immunological tasks like regulation of food intake and digestion, regulation of metabolism, and angiogenesis [17,18]. **So the aim is** to assess the serum leptin level in association with CRP in a sample of Iraqi patients with IBD of variable disease activity index referred to The Gastroenterology & Hepatology Teaching Hospital/ Baghdad.

## Methods

Out of 88 patients diagnosed with IBD, referred to the GIT and Hepatology Hospital/Medical City at Baghdad from December, 2015 to October, 2016, 79 patients who fulfill the inclusion criteria were involved in this study, 38 with ulcerative colitis, and 41 diagnosed as a Crohn's disease. Exclusion criteria: **(**Patients diagnosed with diseases that may affect the serum leptin level such as liver cirrhosis, emaciated patients, malignant diseases or patients on chemotherapy or radiotherapy [18]**,** Diabetes mellitus on insulin therapy as insulin use may increase leptin level [19]**,** Obese patients (BMI more than 30) [18]**,** Lack of participant agreement and patients who did total colectomy). All patients were interviewed, clinical history, and proper examination was done. The diagnosis based on colonoscopy, CT, MRI, US and histopathological examination of mucosa. Patients with UC were separated into three clusters conferring to their disease action and by referring to ulcerative colitis disease activity score (UCDA Index) [20]: (remission and mild disease: UCDA Index ≤ 4, moderate disease: UCDA Index 4-10, severe disease: UCDA Index > 10). Regarding CD, assessment of action of disease by use (CDAI) Crohn's Disease Activity Index [21]. Patients were categorized into three collections: remission and mild disease < 220 points, moderate 220- 450, severe > 450. Fasting serum leptin were collected from subjects at morning. Centrifuged of blood for 10 mins and then accumulate and serum tasters were directly cold at – 48 c. Various methods for the estimation of body fat are available such as calculation of body mass index (weight (kg) divided by the square of height (m)) (BMI). So, the reference range of serum leptin differ from patient to other depending on the BMI, gender, and age group, for this reason patients divided (according to their leptin level) into three groups: (high leptin level, normal leptin level and low leptin level). Statistical analysis: t-test, for variances between the mean of 2 groups ( normal distribution), Mann W. test for variances between the mean of 2 groups ( skewed distribution), more than 2 group used K. W. test (skewed distribution). Binary logistic regression analysis used to calculate the odd ratio (OR). All data analysed by SPSS 22, P- value consider significant when less than 0.05.

## Results

Patients with UC had significantly higher BMI compared to CD, gender also had significantly difference between UC and CD, in which female to male ratio was 1.9:1 in UC and 0.64:1 in CD, serum leptin was significantly higher in UC compared to CD.

There was no significant difference in the distribution of disease activity index and type of IBD as illustrated in table 1. In UC disease activity index significantly associated with serum leptin, in which as the disease activity increase serum leptin decrease (inverse association), while in CD no such association was observed as illustrated in table 1. In patients with UC patients with remission had significantly lower serum CRP compared to both disease activity (moderate, severe) and in patients they had CD patients with remission had significantly lower CRP value compared to moderate and severe disease activity as illustrated in table 1.

**Table 1 : distribution of disease action index in IBD**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Crohn's disease** | | | | **Ulcerative colitis** | | | | **P value** |
| | **Number** | | **Percent** | **Number** | **Percent** | | | |
| Remission | 17 | | 41.5% | 10 | 26.3% | | | |
| Moderate | 20 | | 48.8% | 22 | 57.9% | | | 0.333 |
| Severe | 4 | | 9.8% | 6 | 15.8% | | | |
| **Leptin level** | **Ulcerative colitis** | | | | **Crohn's disease** | | | |
| | **Remission** | **Moderate** | **Severe** | **P value** | **Remission** | **Moderate** | **Severe** | **P value** |
| Low | 0 | 1 | 3 | 0.045a | 1 | 3 | 1 | 0.773 |
| | 0.0% | 4.5% | 50.0% | | 5.9% | 15.0% | 25.0% | |
| Normal | 3 | 10 | 2 | | 10 | 8 | 2 | |
| | 30.0% | 45.5% | 33.3% | | 58.8% | 40.0% | 50.0% | |
| High | 7 | 11 | 1 | | 6 | 9 | 1 | |
| | 70.0% | 50.0% | 16.7% | | 35.3% | 45.0% | 25.0% | |
| Median (IQR) | 20.2 (12.9 – 25.7) | 12.6 (5.6 – 23.4) | 3.8 (1.2 – 17.8) | 0.057a | 3.6 (1.7 – 8.5) | 5.0 (2.2 – 15.6) | 1.1 (0.7 – 3.3) | 0.134 |

| **Leptin level** | **Ulcerative colitis** | | | | **Crohn's disease** | | | |
|---|---|---|---|---|---|---|---|---|
| | **Remission** | **Moderate** | **Severe** | **P value** | **Remission** | **Moderate** | **Severe** | **P value** |
| Median (IQR) | 0.49 (0.27-0.80) | 1.22 (0.38-1.83) | 4.98 (2.4-7.3) | 0.017 | 0.25 (0.15-2.04) | 1.09 (0.22-7.1) | 1.06 (0.53-7.81) | 0.043 |

P- value < 0.05 ( significant).

Significant association between leptin and CRP in individual with UC, in subset analysis in which we divide UC into 3 groups (remission, moderate and severe disease activity), only in the patients with remission there was significant direct linear relationship between CRP and leptin, while in the other group no relationship was observed as illustrated fig. (1, 2).

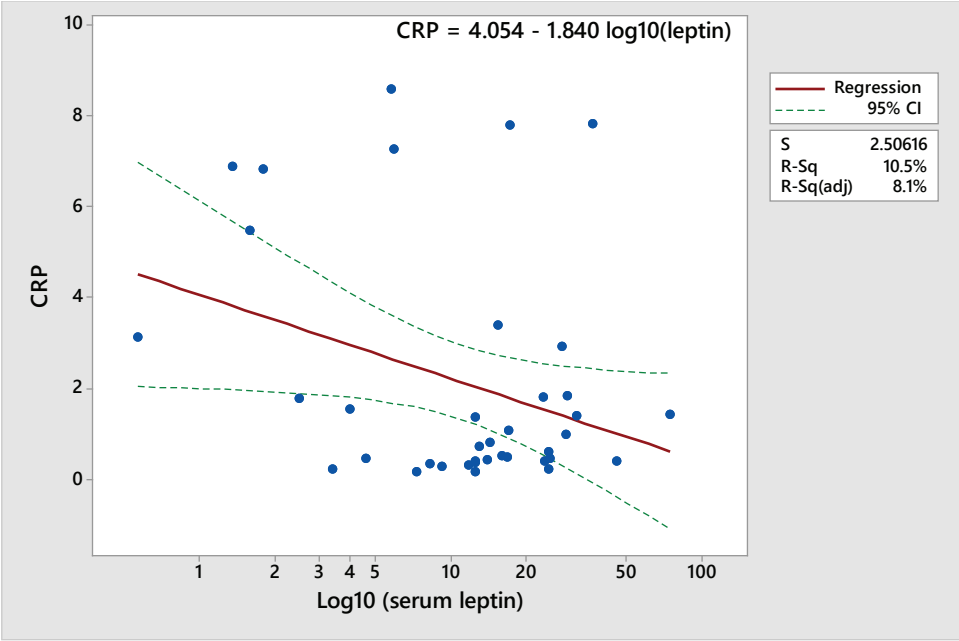


**Figure 1: correlation between CRP and leptin in patients with UC (serum leptin was transformed using logarithmic scale)**

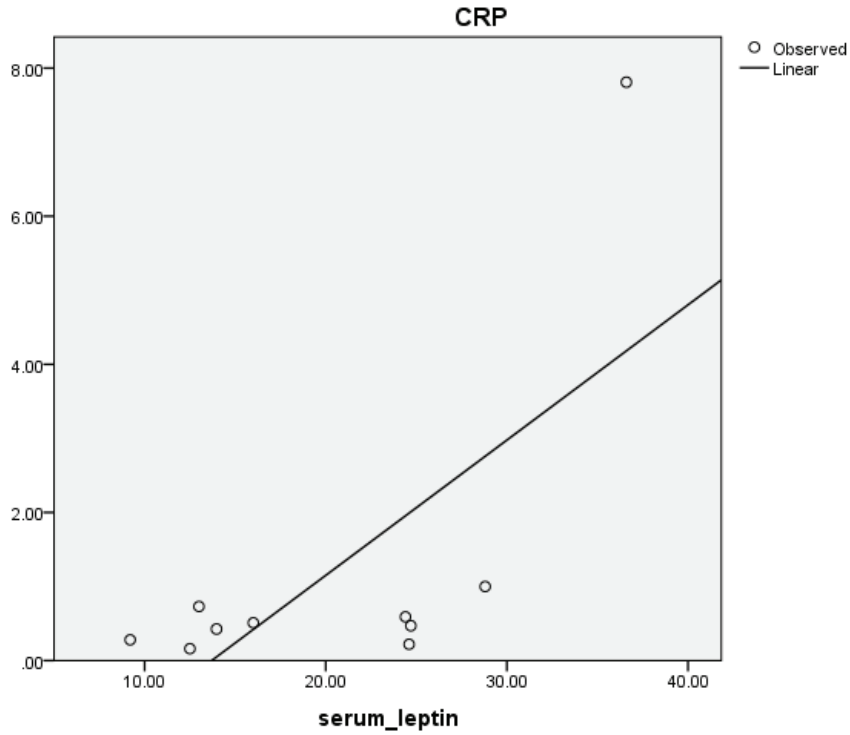


**Figure 2: correlation between CRP and leptin in UC for patients with remission**

Overall there was significant (direct) logistic relationship between CRP and serum leptin (see figure 3), in each of the subgroups (remission, moderate and severe), no significant association between CRP and leptin in patients with CD.

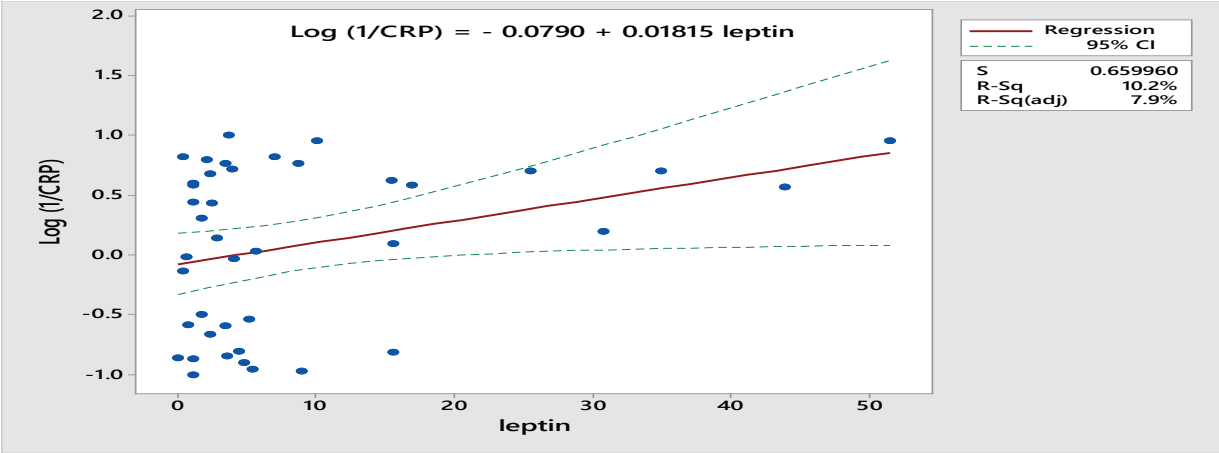


**Figure 3: correlation between CRP and leptin in patients with CD (serum leptin was transformed using logistic scale).**

## Discussion

Causes of IBD is blurred most studies showed the disease developed as genetic basis or due to immune response to food allergens and bacteria that casing agitated intestine [22]. The average age of patients they had IBD was 30 years old. UC can occur at any age, although diagnosis before the age of five years or after 75 years is uncommon. The peak incidence of UC occurs in the second and third decades of life [23]. Another studies show the median age was 30 years also [24]. Data reveled that there is a significant variance between patients with UC and CD by fact of gender, in which female to male ratio was 0.64:1 in CD and 1.9:1 in UC. many studies showed that female with less risk to have Crohn's disease, so female to male ratio was 1:3, 1:1. Our data reveled that patients with UC had significantly higher BMI compared to CD, this might be illustrated by the reduced dietary intake and malabsorption which was more severe in patients with CD. According to a large Chinese research done by Jie Dong et al [25] in which 1442 patients diagnosed with IBD were involved, results showed that CD patients had significantly lower BMI compared to controls (95% CI-2.77 to -1.00, P< 0.001), while no obvious difference was observed in UC patients. Our data reveled that serum leptin level was significantly upper in those patients with UC likened with CD patients, this may be due to the higher number of female patients with UC, since females have higher fat mass than males, which might the cause of this significant increase in leptin level. In patients with UC patients with remission had significantly lower serum CRP compared to both moderate and severe disease activity and in patients with CD with remission had significantly lower CRP value compared to moderate and severe disease activity, many past studies showed that CD had higher CRP level than UC patient, and high level of IL-6 [26]. In our study, results showed that the relationship between disease activity and leptin level in UC group was an inverse relationship, in which when the activity of the disease increase, serum leptin level decrease, On the other hand, there was no significant relationship between leptin level and CD activity index, Studies assessing serum leptin levels in IBD activity showed controversial results [27]. In a study by Karmiris et al [18], serum leptin levels ( s. leptin level in UC 10.6±2.0 ng/mL and in CD was 12.5±2.6 ng/mL) were significantly decreased in UC patients compared to CD patients these results were nearly comparable with our study's results. In our study we compared the level of serum leptin with that of CRP in both UC and CD. Significant association between leptin and CRP in individual with UC. Results showed that only in the patients with remission there was significant direct linear relationship between CRP and leptin, while in the other group no relationship was observed [22]. , there was significant (direct) logistic relationship between CRP and serum leptin, while in each of the subgroups (remission, moderate and severe) there was no significant relationship observed between CRP and leptin. there was non-significant relationship, while there was a significant one when we add CRP parameter. This means that the effect of CRP was stronger than that of serum leptin in CD patients. On the other hand the effect of leptin may be become more obvious when after adding the CRP effect as another variable, up to the date this study was established, we did not find other previous studies comparing the level of both serum leptin with that of CRP, so this study is an original one.

## Conclusion

There is a significant correlation between disease activity in UC and CD with serum CRP. Comparing both CRP and leptin level showed that there is an overall significant association with both UC and CD, but not useful for defining their activity index.

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# Influence of Quality of Nursing Work Life on Nurses' Turnover Intention: the Mediating Effect of Organizational Commitment

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## Abstract

The top priority of this study was to identify how nurses' organizational commitment (OC) serves as a mediating factor between Quality of Nursing Work Life (QNWL) and turnover intention (TI) among Korean nurses. Three hundred thirteen registered nurses working in hospitals participated in this study. Mediating effect analysis was conducted to identify the relationship between QNWL, OC, and TI. The results revealed significant correlations between variables. OC showed a perfect mediating effect in the relationship between QNWL and TI. The results suggest that nurses' QNWL has a significant influence on the TI, which is mediated via OC.

***Keywords:*** *Nurses, turnover intention, Quality of life*

## Introduction

With a continuous increase of the aging population and the number of chronic illnesses every year, hospitals are trying to provide specialized and patient-oriented medical services.[1] Frequent changes in the medical environment can be a burden to nurses, reducing job satisfaction and increasing the turnover intention, with most countries suffering from a nurse shortage.[2–4] A lack of skilled nursing staff due to high nurse turnover rates leads to overtime work and higher patient-to-nurse ratios, as many patients to be cared for increases. In turn, the quality of medical services is reduced and efforts made on quality improvement and workforce development programs, such as training for new nurses, result in increased health service costs.[5]

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The turnover intention is a response to job dissatisfaction and refers to the intention to move from one's current job to a new one; it is a variable that explains the actual turnover behavior.[6] To manage turnover intention, it is necessary to systematically grasp factors that affect the turnover intention from various perspectives.[7] Age, position, education level, marital status, working status, career, and salary are factors affecting the turnover intention.[8] Situational variables include QNWL, OC, job satisfaction, and job stress.[9]

QNWL is a very important factor for employees. In recent years, hospital administrators have been trying to identify and improve the indicators that affect the QNWL in order to prevent the loss of competent nurses. QNWL refers to harmony of work and personal life, including elements required by nurses in order to work satisfactorily in their workplace; therefore, it can be viewed as a reliable and valuable concept that can be used to measure the QNWL of nurses and identify changes that need to be implemented to increase the productivity of the organization.[12] In general, QNWL was found to affect nurses' job satisfaction and turnover intention.[13] QNWL and turnover intention have been reported to be negatively correlated,[3,9,10] while QNWL

and OC have been reported to be positively correlated.[14]

OC is closely related to how strongly the members trust and agree with the goals and values of the organization, how willing they are to do their best while at the organization, and how earnestly they wish to remain as staff members.[15] It has been identified as the most influential factor regarding nurses' turnover intention,[16] and a major attitude variable for nursing staff with a positive influence on organizational effectiveness.[17]

QNWL and OC influence each other, as do OC and the turnover intention. An intermediating effect of emotional OC on the relationship between the QNWL and the turnover intention was found for university professors and other employees.[18,19] However, no studies have explored the possible intermediating effect of OC on the relationship between QNWL and the turnover intention among nurses. Therefore, this study aimed to identify how nurses' OC serves as a mediator between the QNWL and the turnover intention.

## Material and Method

### Study design and sample

This was a descriptive study aiming to analyze the relationship between QNWL, OC, and the turnover intention and to confirm how nurses' OC serves as an intermediary between the QNWL and the turnover intention.

Three hundred and thirteen general nurses in Seoul and Gyeonggi Province for more than one year participated in this study. Nurses working in general institutions are usually not satisfied with their job during their first year[20]; thus, nurses with less than 12 months of experience were excluded from this study owing to differences in job satisfaction due to length of service.[20]

### Ethical Considerations

This study was approved by the Institutional Ethics Committee of Y University (IRB No. 2014-0061-1). Participants were requested to sign an informed consent form before taking part in the survey.

### Measures

Quality of nursing work life

The Korean version of the QNWL tool[21] based on Brooks'[11] QNWL tool was used in this study. This measure has 36 items in four sub-domains. The higher the score, the higher the QNWL.[21] The internal consistency of the original tool[11] was .37–.88, while the Cronbach's α of the QNWL-K[21] was .69–.93.

### Organizational commitment

To measure nurses' OC, this study adopted a tool designed by Mowday et al.[15] and translated by Kim.[22] This tool includes 15 items. Higher scores reflect higher OC. The reliability of the original instrument measured with Cronbach's α was .82 to .93, and .89 in the study by Kim.[22] Cronbach's α in this study was .82.

### Turnover Intention

We used a modified tool by Park[23] to measure nurses' turnover intention by adding four questions from the tool used by Lawler.[6] Lower scores reflect lower turnover intention. Cronbach's α was .88 in the study by Park,[23] and .85 in the present study.

## Data Analysis

Data were collected over one month from May 1 through 30, 2015. In the final analysis, 313 questionnaires were used.

SPSS 24.0 program was used to analyze the data. T-tests and ANOVA were performed to analyze the differences in variables by nurses' characteristics, and Scheffé's test was performed for post-hoc comparisons. Pearson's correlation coefficient was used to analyze the relationship between QNWL, OC, and turnover intention. Finally, we examined the mediating effect of OC using the procedure of Baron and Kenny,[24] and verified the significance of the mediation effect with the Sobel test.

## Results and Discussions

### Descriptive statistics

The QNWL of nurses showed a significant difference according to the following general characteristics: marital status ($t = 2.50$, $p = .013$), hospital type ($t = 5.43$, $p = .005$). OC showed significance for age ($F = 10.87$, $p < .001$), education level ($F = 10.30$, $p < .001$). Turnover Intention showed significant differences for marital

status ($t$ = -3.88, $p$ < .001), age ($F$ = 10.47, $p$ < .001), total clinical career ($F$ = 2.96, $p$ < .033). (Table 1).

**Correlations between variables**

Significant positive correlations between QNWL and OC ($r$ = .63, $p$ < .001), and between QNWL and nurses' turnover intention ($r$ = -.43, $p$ < .001) were found. (Table 2)

In order to determine the intermediating influence of OC on the relationship between QNWL and turnover intention, the three-step analysis procedure developed by Baron and Kenny[24] was used (Table 3). The Sobel test showed that OC had served as a significant mediator in the relationship between QNWL and the turnover intention ($Z$ = -8.07, $p$ < .001; Figure 1).

**Table 1. Differences in Quality of Nursing Work Life, Organizational Commitment, and turnover intention According to Participant Characteristics (N = 313).**

| Characteristics | Categories | N | (%) | QNWL | | Organizational commitment | | Turnover Intention | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | M ± SD | t or F (p) | M ± SD | t or F (p) | M ± SD | t or F (p) |
| Total | | 313 | (100.0) | 3.77±0.57 | | 3.02±0.47 | | 3.40±0.82 | |
| Gender | Male | 11 | (3.5) | 4.02±6.61 | 1.51 | 3.32±0.62 | 1.63 | 3.47±0.88 | .33 |
| | Female | 302 | (96.5) | 3.76±0.57 | (.133) | 3.01±0.49 | (.133) | 3.40±0.82 | (.742) |
| Age | ≤29 a | 153 | (48.9) | 3.69±0.53 | 2.49 | 2.88±0.39 | 10.87 | 3.56±0.75 | 10.47 |
| | 30–39 b | 117 | (37.4) | 3.74±0.54 | (.084) | 2.98±0.45 | (<.001) | 3.50±0.78 | (<.001) |
| | ≥40 c | 43 | (13.7) | 3.89±0.62 | | 3.22±0.47 | a,b<c | 3.03±0.86 | a>b,c |
| Education | College (3 years)a | 116 | (37.1) | 3.68±0.55 | 2.48 | 2.87±0.45 | 10.30 | 3.46±0.77 | 1.06 |
| level | Bachelor (4 years)b | 177 | (56.5) | 3.82±0.56 | (.085) | 3.08±0.46 | (<.001) | 3.46±0.77 | (.348) |
| | Master's degreec | 20 | (6.4) | 3.86±0.66 | | 3.31±0.40 | | 3.18±0.89 | |
| Marital status | Married | 104 | (33.2) | 3.89±0.63 | 2.50 | 3.14±0.51 | 2.94 | 3.15±0.88 | -3.88 |
| | Single | 209 | (66.8) | 3.71±0.52 | (.013) | 2.97±0.44 | (.004) | 3.52±0.76 | (<.001) |
| Hospital type | Tertiary | 94 | (30.0) | 3.93±0.60 | 5.434 | 3/26±0.43 | 20.505 | 3.40±0.91 | 1.75 |
| | General | 154 | (49.2) | 3.69±0.53 | (.005) | 2.90±0.44 | (<.001) | 3.46±0.75 | (.176) |
| | Hospital with less | 65 | (20.8) | 3.74±0.55 | | 2.96±0.47 | | 3.24±0.82 | |
| | than 300 beds | | | | | | | | |
| Total clinical | 1-3 a | 60 | (19.2) | 3.79±0.49 | .70 | 3.06±0.37 | 3.63 | 3.46±0.79 | 2.96 |
| experience | 3-5 b | 61 | (19.5) | 3.68±0.59 | (.168) | 2.90±0.47 | (.013) | 3.61±0.77 | (.033) |
| (years) | 5-10 c | 98 | (31.3) | 3.72±0.57 | | 2.97±0.47 | b<d | 3.39±0.79 | b>d |
| | ≥10 d | 94 | (30.0) | 3.87±0.57 | | 3.13±0.50 | | 3.23±0.87 | |
| Salarya | <30a | 120 | (38.3) | 3.62±0.53 | 7.66 | 2.88±0.44 | 20.66 | 3.43±0.77 | 9.79 |
| | 30-50 b | 155 | (49.5) | 3.83±0.54 | (.001) | 3.04±0.42 | (<.001) | 3.50±0.76 | (<.001) |
| | ≥50 c | 38 | (12.1) | 3.97±0.69 | a,b<c | 3.40±0.52 | a,b<c | 2.87±0.97 | b>a,c |
| Children | Without children | 228 | (72.8) | 3.71±0.54 | -2.88 | 2.97±0.45 | -2.90 | 3.51±0.79 | 3.90 |
| | Children | 85 | (27.2) | 3.92±0.61 | (.004) | 3.14±0.48 | (.004) | 3.11±0.83 | (<.001) |

[a]Korean currency: million won; QNWL: quality of nursing work life; M: mean; SD: standard deviation.

**Table 2. Correlational Relationships between QNWL, Organizational Commitment, and Turnover Intention (N = 313).**

| Variables | QNWL | Organizational commitment | Turnover Intention |
|---|---|---|---|
| | r (p) | r (p) | r (p) |
| QNWL | 1 | .63 (<.001) | -.43 (<.001) |
| Organizational commitment | | 1 | -.61 (<.001) |
| Turnover intention | | | 1 |

**Table 3. Mediating Effect of Organizational Commitment on the Relationship between QNWL and Turnover Intention (N = 313).**

| Equations | B | β | T | p | Adj.r2 | F | p |
|---|---|---|---|---|---|---|---|
| 1. QNWL → OC | 0.22 | 0.627 | 14.18 | <.001 | 0.39 | 201.05 | <.001 |
| 2. QNWL → TI | 0.07 | 0.43 | 8.43 | <.001 | 0.18 | 71.02 | <.001 |
| 3. QNWL, OC→ TI | | | | | 0.38 | 95.11 | <.001 |
| 4. QNWL→ TI | 0.01 | 0.08 | 1.34 | .182 | | | |
| 5. OC → TI | 0.26 | 0.57 | 9.86 | <.001 | 0.38 | 187.96 | <.001 |

**Figure 1. Model showing the Influence of Quality of Nursing Work Life on the Turnover Intention and the Mediating Effect of Organizational Commitment.**

## Discussion

The average score of turnover intention was 3.4 out of 4.00. This is relatively high compared to the turnover intention score of 2.96 found among nurses in small-sized hospitals obtained using the same tool by Hwang and Kang.[7] The general characteristics that showed a difference in turnover intention were age, marital status, children, and clinical career. Turnover intention was higher for those aged below 29, single, without children, and with clinical experience between 3–5 years and a higher salary. These results were supported by a previous study.[25] Nurses with clinical careers of 3–5 years tend to perceive their work as repetitive rather than experiencing

increased confidence. Therefore, differentiated policies and efforts are needed to lower the turnover intention among nurses.

In this study, there were statistically significant correlations between QNWL, OC, and the turnover intention. QNWL and OC showed a very strong positive correlation. Additionally, QNWL and the turnover intention were negatively correlated, as previously noted.[9,27] OC and the turnover intention showed a strong negative correlation, which adds to the body of literature suggesting that OC is the strongest correlated factor among those negatively correlated with the turnover intention.[7]

Our results showed that OC functioned as a significant mediator between QNWL and the turnover intention. This implies that OC is a critical factor in the relationship between QNWL and the turnover intention. OC can be increased by increasing QNWL, and the turnover intention can be decreased by increasing OC. In addition to the demonstrated mediating effects of OC in relation to nurses' perceptions of work environment and turnover intention.[1] This study confirmed the full mediating effect of OC between QNWL and the turnover intention. Therefore, hospital administrators need to understand the relationships between these variables in order to reduce nurses' turnover rates. Career development courses are needed to improve the relationship between multidisciplinary teams working together in hospitals, and customized welfare system should be strengthened in order to increase QNWL. Furthermore, employee management strategies that reflect the existing hospital system should be developed to enhance the overall QNWL, toward the aim of fostering a healthy work/life balance for nurses.[19,27]

This study has several significant implications. First, we confirmed the degree of QNWL of Korean nurses, which is an important concept for enhancing organizational productivity through the harmonization of work and personal life. Second, by analyzing the intermediating influence of OC in the relationship between QNWL and turnover intention, which is closely related to the quality and cost of medical services, we deepened our understanding of the turnover intention and provided basic data for the development of interventions. Third, by using the QNWL-K based on Brooks'[11] QNWL tool, which is widely used in Asian countries comparisons of the same items are made possible. However, since this study was conducted with nurses working in hospitals in Seoul and its metropolitan area, there is a limitation to the generalizability of the results.

## Conclusion

The findings of this study revealed that QNWL and OC were positively correlated, whereas OC and turnover intention were negatively correlated. OC was also found to fully mediate the relationship between QNWL and the turnover intention. Therefore, policies and organizational efforts to raise QNWL should be developed to increase OC.

Since this study examined the relationship between QNWL, OC, and the turnover intention, we propose further empirical studies to identify the factors affecting QNWL, which will be useful for the development of intervention programs for improving it. Additionally, we propose a follow-up study to identify QNWL levels and influential factors for nurses working in various fields as well as hospitals.

**Ethical Clearance**: Approved

**Source of Funding:** Self

**Conflict of Interest:** Nil

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# The Role of Aspiration and Thyroxine Suppression Therapy in Management of Benign Thyroid Nodules

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## Abstract

A prospective study on 142 patients presenting with (benign euthyroid nodule) , after diagnostic work-up included a clinical evaluation, thyroid function tests, ultrasonography, thyroid scintigraphy and fine needle aspiration cytology. Based on the investigations, patients were managed with aspiration andthyroxine suppression therapy for sex month . Patients were divided into four groups according to their response of treatment ,group( 1) complete shrinkage response ,group( 2) reduction in size ,group (3) no response but same size and group (4) enlarge in size non responders'.Of the 142 patients17 (12 %) were male, and 125 (88 %) were female. The age rangein 99 (69.7%) patients were between 21 and 50 years and forty three patients were above 50 years of age. We divided our result into four groups,group( 1) complete shrinkage response29 patients' (20.5%),group( 2) reduction in size 45 patients' (31.8%),group (3) no response but same size38 patients' (26.7%) and group (4) enlarge in size non responders30 patients'(21% )Thyroxine suppressive treatment were effective in shrinking about one fifth of thyroid nodules. Similarly, there was reduction in size in about one third of nodule.From 17 male 6 patients (35 %) achieve complete response ,while only23 female patients (18 %) achieve complete response, and from17 male patients 5 (29 %) achievereduction in size,while only 40 female patients (32 %) achieve reduction in size. Young age less than fifty achieve good response than older patients(63.6%).Single aspiration needed in26 patients(18.3%) while multiple aspiration needed in 116 patients(81.7%).

***Key words :*** *Aspiration, Thyroid Nodules , thyroxine suppression treatment.*

## Introduction

Medical management of benign thyroid nodules may deter the requirement for medical procedure and morbidity related to it. Thyroxine inhibition treatment is being used in the medicinal management of euthyroid benign nodules [1 2]. Nodular thyroid infection still one of the common endocrine troubles. The majority thyroid nodules are benevolent hyperplastic injury however 5 to 20% of thyroid nodules are genuine neoplasm [3]. The predominance of thyroid nodules differs impressively relying upon an assortment of elements that incorporate iodine consumption inside a given populace, age, sex, diet, drug and natural radiation presentation.

The age-related is increment the nodularity and thyroid volume. Little thyroid nodule are ordinarily found in patients with a simultaneous history of Hashimoto's Thyroiditis[4]. The significance of dealing with a thyroid nodule in the early separation among benign and harmful nudule, since the way to deal with treatment in the two is thoroughly different. The viability of thyroxine concealment treatment in benign euthyroid nodule brings about the justification of medical procedure in such patients.

Most investigations have demonstrated that a little of thyroid nodule relapse in patients treatment with thyroid hormone. Nonetheless, the suppressive treatment appears to intervene with goitrogenesis in numerous patients, and recent hypothesis proposes that it could diminish the danger of thyroid oncogenesis[5].

Inhibition of thyroid-stimulation hormone(TSH) discharge in ordinary subjects by the giving of thyroid hormone brings about thyroid decay [6],even though the pathogenesis of thyroid nodule and irregular nontoxic multinodular goiters is ineffectively comprehended, TSH is dared to be essential if not adequate and, along these lines, inhibition of TSH secretion may be relied upon to bring about a diminishing in nodule or goiter size or possibly avert further augmentation.

The significance of TSH in goiter production changes with the reason for the goiter. For instance, in patients with iodine inadequacy or autoimmune disease (Hashimoto's), an elevated in TSH secretion is the dominating reason for goiter. Conversely, the majority patients with thyroid nodule or irregular nontoxic multinodular goiters have typical serum TSH levels, especially persons with nontoxic multinodular goiters, the thyroid expansion is most likely caused by many factors (include TSH) that work after some time on thyroid follicular cells that have special manufactured and growth possibilities. The effect is spread and presently multinodular thyroid augmentation; a few nodule inevitably become independent [7]and others may experience cystic deterioration. Since the thyroid hormone is assumed to decrease goiter size by diminishing TSH emission, inhibition treatment would be relied upon to be ineffectual in patients in whom plasma TSH levels were previously subnormal because of autonomous thyroid hormone creation [8]

## Patients and Methods

The research was carried out in AL-Zahra teaching hospital from May 2011 until May 2015, on 142 patients presenting with (benign euthyroid nodule) , after diagnostic work-up included a medicalevaluation by history information, write of present symptoms with their period, a systemic assessment and local assessment of the thyroid enlargement and the neck . The quantitative determination of plasma triiodothyronine(T3) and plasma thyroxine(T4) was carried out by radioimmunoassay(RIA), (normal values of T3: 0.72-2.2 ηg/ml, T4: 5.6-13.6 μg/ml). Serum TSH was measured by the immunoradiometric assay (IRMA), (normal range 0.3–6.5 μIU/ml). Fine Needle Aspiration Cytology( FNAC) was performed as therapeutic and diagnostic, result were write as thyroid cyst. According to the earlymedical, biochemical assessment, FNAC and thyroid examine. The subsequentsubjects were excluded from this study: Goiter hypothyroidism, hyperthyroidism, pre-pubertal and pubertal, distribute nodular goiter and suspicious FNAC result.

All included patients after aspiration given thyroxine suppression at a dose of 50–100 μg every day. TSH was reserved in the littletypical range for 6 months. subjects were followed up every month to observe the size of the nodules by medical palpation and ultra-sonography also repeated aspiration was performed for those with persistent nodule. Patients were divided into four groups according to their response of treatment group(1) complete shrinkage response ,group(2) reduction in size ,group (3) no response but same size and group (4) enlarge in size non responders' .Operation was performed in states where the nodule did not retreatfollowing6 months of thyroxininhibition.

## Findings

Of the 142 patients17 (12 %) were male, and 125 (88 %) were female. The median age was 37 years Ninety nine (69.7%) patients were between 21 and 50 years and forty three(30.3%) patients were above 50 years of age. We divided our result into four groups, group( 1) complete shrinkage response 29 patients'(20.5%),group( 2) reduction in size 45 patients' (31.8%),group (3) no response but same size38 patients' (26.7%) and group (4) enlarge in size nonresponders30 patients'(21% ) Thyroxin suppressive treatment were effective in shrinking about one fifth of thyroid nodules. Similarly, there was reduction in size in about one third of nodule. From 17 male 6 patients (35 %) achieve complete response ,while only23 female patients (18 %) achieve complete response, and from17 male patients 5 (29 %) achieve reduction in size, while only 40 female patients (32 %) achieve reduction in size. From 99 Young age patients(less than fifty years) 63 patients(63.6%) achieve good response either complete response 25 patients(25.2%) or reduction in size 38 patients(38.3%),while from 43 older patients11 patients(25.6%) achieve good response either complete response 4 patients(9.3%) or reduction in size 7 patients(16.2%). The common side effect areweight loss 7 patients(4.9%) , insomnia4 patients(2.8%) and palpitation 16 patients (11.2%) but all patients tolerate these side effectby reduction the dose.Single aspiration needed in6 patients(4.2%) while multiple aspiration needed in 136 patients(95.8%. Group 3 and 4( 68 patients 47.8%), there was no response in spite of aspiration and thyroxin suppressionunderwent subtotal thyroidectomy.

**Table (1) Response groups and Sex.**

| Response | Male | Female |
|---|---|---|
| ( 1) Complete Shrinkage | 6 | 23 |
| ( 2) Reduction in Size | 5 | 40 |
| (3) Same Size | 3 | 35 |
| (4) Enlarge in Size | 3 | 27 |

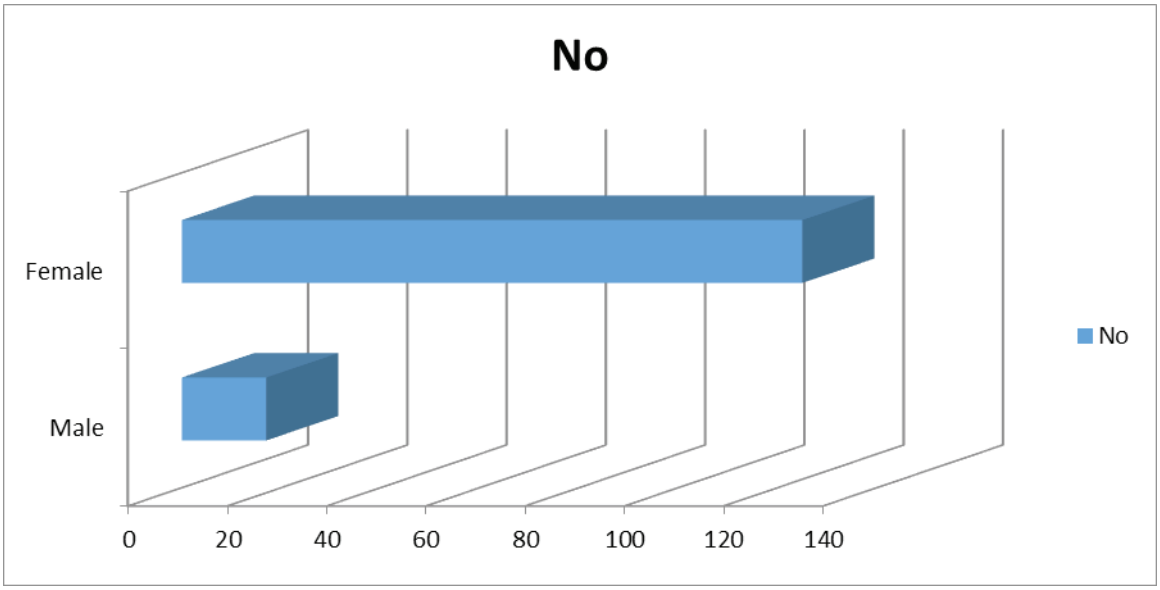


**Figure (1) number of patients sex.**

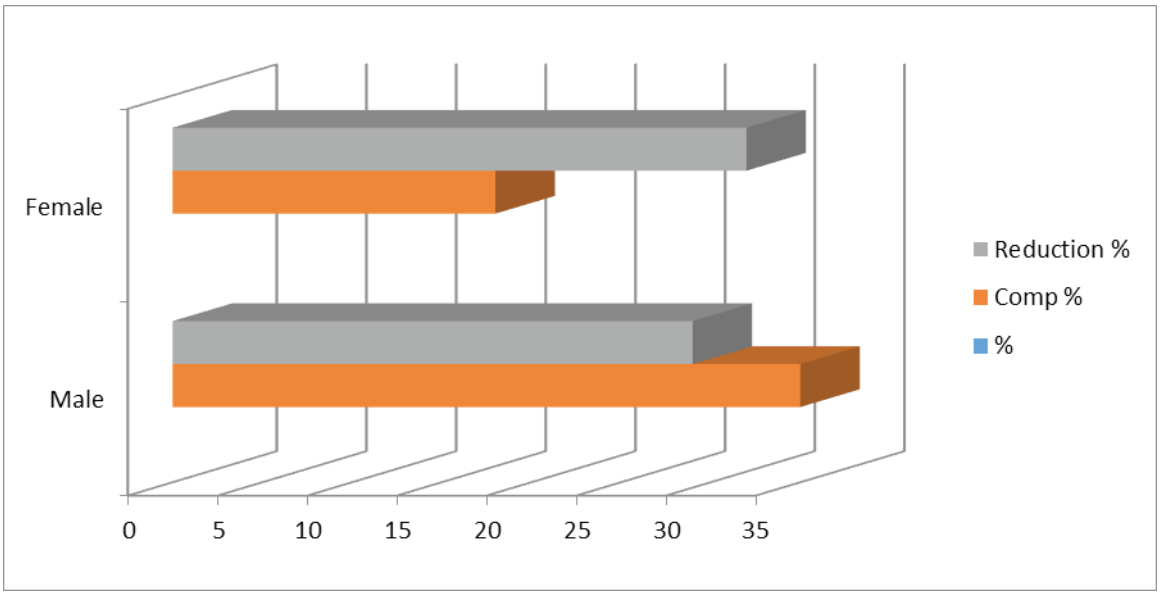


**Figure (2) patient sex and response to thyroxine suppression therapy.**

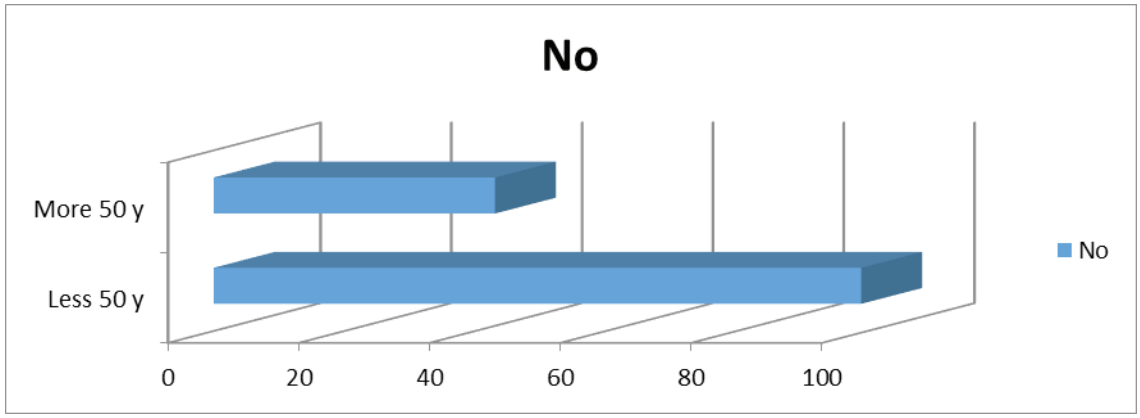


**Figure (3) patients age distribution .**

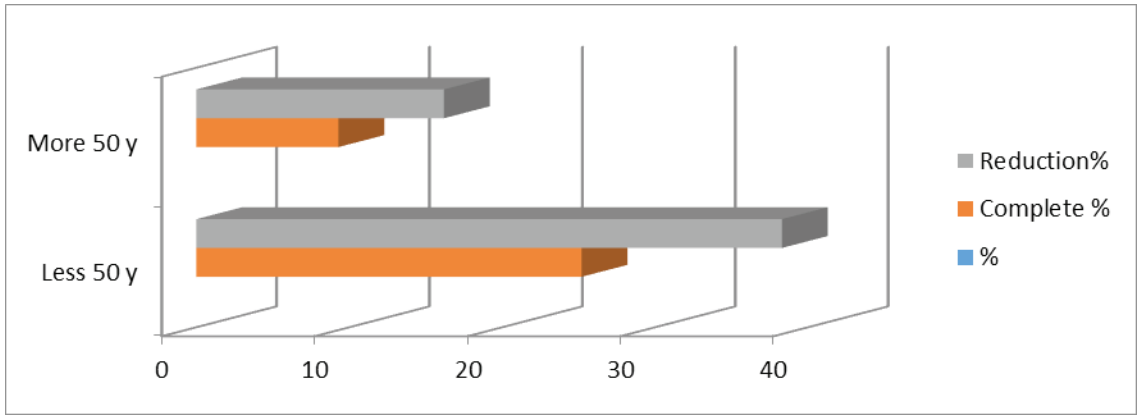


**Figure (4) patients age and response to thyroxine suppression therapy.**

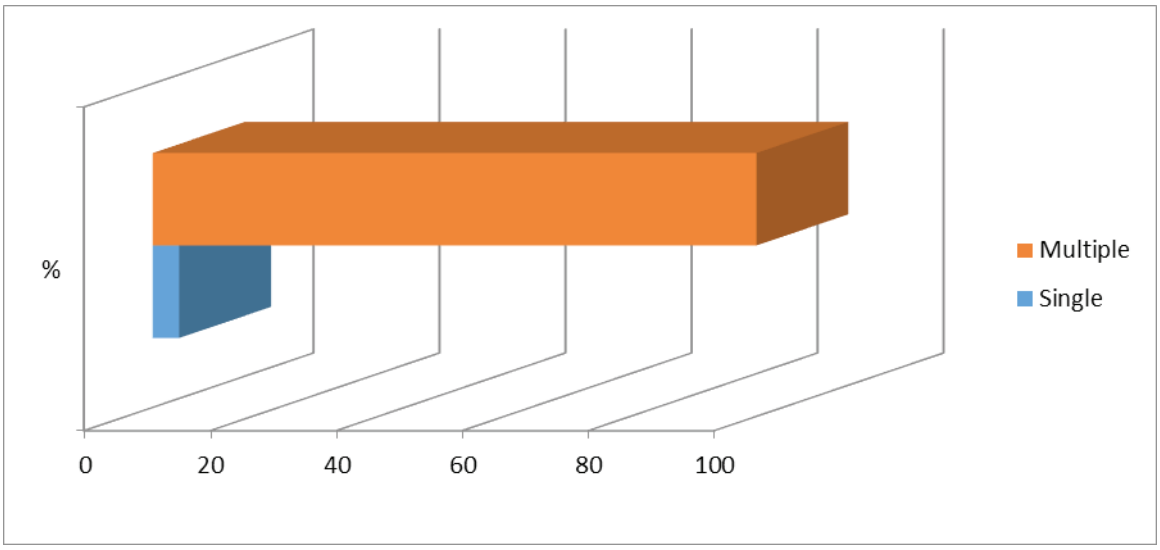


**figure (5) the percentage of aspirationneeded**

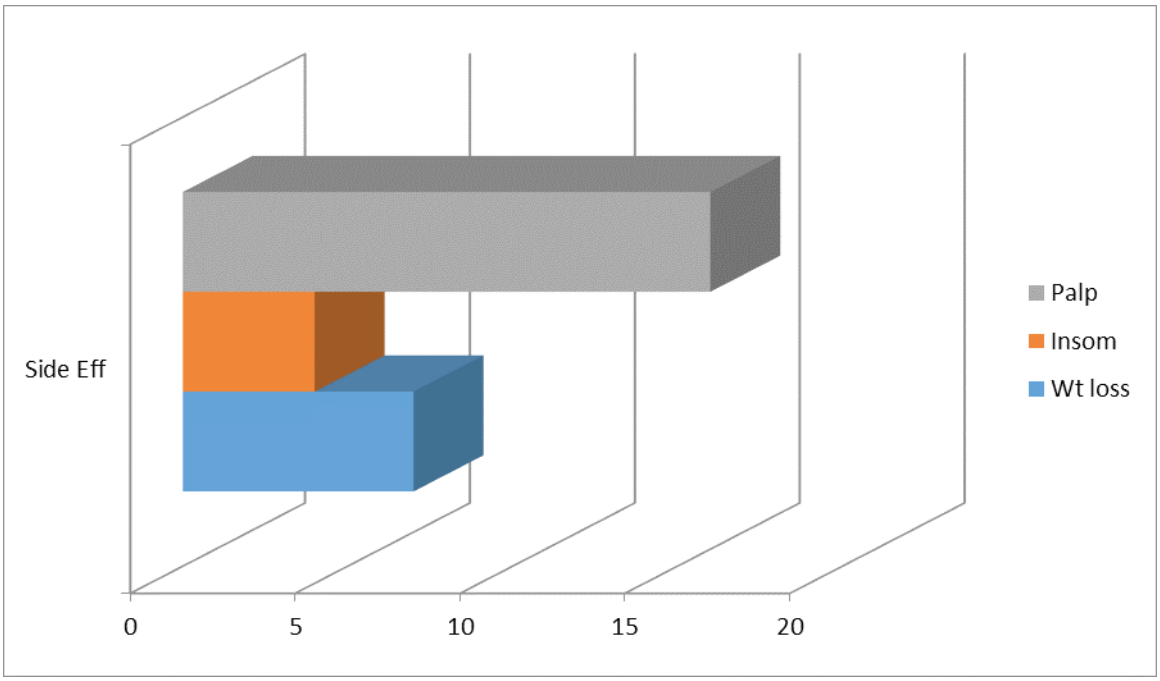


**Figure (6) The common side effect**

## Discussion

The American Association of Clinical Endocrinologists(AACE) does not containthyroxininhibition in its advice for running of benign euthyroid nodule[8]and restricts its use to patients with FNAC negative thyroid nodules not from iodinepoorregion, youthfulpersons with little goiter and nodules with no confirmation of practical autonomy. It additionalconditions that thyroxine inhibitionmust be avoided in big goiter, clinically doubtfulinjury or those with insufficient cytologic example, in postmenopausal females or persons with osteoporosis and cardiovascular disease. However, thyroid hormone treatment for nodular goiter, for superficial reasons or to avoid investigative and healingoperation surgery, results in reasonable to totalweakening of the nodule[9].Zygmunt, reports that in the early stage hyperplasic goiter may regress if thyroxine is given at a dose of 0.15- 0.2mg daily for a few months [10].

Thyroxine inhibitiontreatment with aspiration is an suitablesubstitute as long as the person is followed-up cautiously at 3-month period because fluid may be re accumulated[11].It is set in dosageenough to inhibit the TSH value to 0.1–0.5 µU/ml for 6 months; additionalextendedtreatment is kept for persons in whom a reduce in nodule size is recognized on USG. following 12 months, the dosage of thyroxine is reduced to preserve the plasmalevel of TSH in the little normal value. information also propose that thyroxine inhibition for benign nodules does not decisively result in decline of nodules, while a littleexamination of inhibition may be sensible in special patients[12].A study by La Rosa [13]has shown a 35% reduction in the size of the colloid and regenerative nodules. In our study, we achieve shrinkage in about one-fifth of thyroid nodules(20.5%),. Similarly, there was a reduction in size in about one-third of nodule(31.8%) at a response rate of 52,3%. In our study 17 patients (12 %) were male, and 125 (88 %) were female, Figure (1). These because that every kinds of simple goiter are extrafrequent in women than menas a result of the found of estrogen receptors in thyroid tissues[10].

The age range in 99 patients (69.7%) were between 21 and 50 years and 43 patients (30.3%) were more than 50 years of age Figure (3). In a review article, Mazzaferri [14]reports an elevated in the occurrence of thyroid nodules with age and a occurrence of 5% in persons at 50 years present by physical palpation. The ultrasonography (USG noticeoccurrence is far elevated, approximately 55%)[15]. Among the response groups, From 17 male 6 patients (35 %) achieve complete response ,while only23 female patients (18 %) achieve complete response,

and from17 male patients 5 (29 %) achieve reduction in size, while only 40 female patients (32 %) achieve reduction in size Figure (2). From 99 Young age patients (less than fifty years) 63 patients(63.6%) achieve good response either complete response 25 patients(25.2%) or reduction in size 38 patients(38.3%), while from 43 older patients11 patients(25.6%) achieve good response either complete response 4 patients(9.3%) or reduction in size 7 patients(16.2%) Figure (4). We conclude that the younger age group of our patients due to the iodine deficiency which endemic in our country and most of our patients were fertile women.

We achieve good responses in the male group because of the absence of the estrogen receptor in thyroid tissue that not competent with thyroxine therapy[10]. Aspiration and FNAC have good sensitivity and a specificity in the exclusion of suspicious nodules[16],but single aspiration was needed in 6 patients(4.2%) while multiple aspirations needed in 136 patients(95.8%) Figure(5) these mean that aspiration was not significant than thyroxine and fluid may re-accumulate without thyroxine and benefit only in FNAC stay the basis of helping to identify suspicious nodule. In our study, no response but the same size in 38 patients' (26.7%) and enlarge in size in 30 persons (21% ), despiterecurring aspiration and thyroxine inhibition. The response speed of 52.3% to aspiration and thyroxine inhibition in the current study was more than that in other studies, wherever it is write to level from 17% [15] to 35%. [13] .The cause could be a larger number of younger persons(63.6%) presented less than 50 years of age). The common side effect is weight loss 7 patients(4.9%), insomnia 4 patients(2.8%) and palpitation 16 patients (11.2%) Figure (6) but all patients tolerate these side effects by reducing the dose.

## Conclusion

Aspiration and thyroxine suppressive treatment were effective in shrinking thyroid nodule. Male patients achieve good response than female patients. The response is better in younger patients.

**Conflict of Interest :** none

**Source of Funding :** self

**Ethical Clearance :** From patients and my college .

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# Assessment of Risk Factors of Lung Cancer Patients in Babylon Governorate ,Iraq

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## Abstract

**Background:** Lung cancer is one of the most common and serious types of cancer. Cigarette smoking is the main cause of lung cancer.The aims of this study was therefore to assess the risk factors of lung cancer patients in Babylon governorate including tobacco smoking , family history, and occupational exposures, measurement of radon gas in the bed room of patients with lung cancer. **Patients and Methods:** A case – control study was conducted in Babylon oncology center , Murjan medical city during the period from 8th of may to 2nd of september 2019. This center received all lung cancer patients in Babylon governorate. **Results:** The study showed that 43.3% of cases were in the age groups 60- 69 years**.** Males constitute 69.5 % of cases, seventy one percentage of cases were residing in a rural area. Smoking is the main risk factors of lung cancer in 75.8% , the risk of lung cancer in current smoker is three times more than that of non smoker .Those who had a family history of lung cancer constitute 8.3% ,of them 3.9% were first degree and 4.4% were second degree ,there was a significant association between lung cancer patients and first degree family history with lung cancer .Those who had a family history of other cancer was 23.6 % .The risk factors include radon exposure, asbestose, beryllium ,cadmium and diesel exposure were significant associated with lung cancer . The radon value in (77) patients of lung cancer were within exceptable limit.**Conclusion :** This study revealed that males, age group 60 and above, rural area and smoking is the main risk factors of lung cancer in Babylon city.There is highly significant association between smoking habits and lung cancer cases p-value<0.05.

***Key words:*** *Risk factors , Lung cancer, Radon exposure, Smoking in lung cancer.*

## Introduction

Lung cancer is the most common cause of cancer death in men and the second in women after breast cancer [1] .There are two main types of lung cancer small-cell lung carcinoma(SCLC) and non-small-cell lung carcinoma(NSCLC).The most common symptoms are coughing(including coughing up blood),weight loss, shortness of breath, and chest pains[2].

The risk factors of lung cancer is a multifactorial ,that is many factors work together to cause lung cancer. Globally, risk factors of developing lung cancer include smoking ,exposure to radon gas, asbestos, radioactive ores such as uranium, inhaled chemicals or minerals like, beryllium,cadmium,chromium compounds,diesel exhaust, air pollution.Family history of lung cancer increases its risk. The debilitated patients with compromised immune system and elderly over the age of 65 years are more prone to the disease [3]. In the USA in 2019 there were about 228,150 new cases of lung cancer 116,440 in men and 111,710 in women , and 142,670 deaths from lung cancer 76,650 in men and 66,020 in women[4]. Each year, more people die of lungcancer than of colon, breast, and prostate cancers combined[4]. The problem of tobacco smoking in Iraq associated with the social and cultural environment, which encourages smoking and influence an individual's attitude toward cigarette smoking [5]. Tobacco smoking is responsible for the majority of lung cancer cases, cigarette smoking is the cause of approximately 90% of lung cancer deaths [6]. Another study reported that lung cancer killed approximately1,590,000 persons in2012[7].The primary

risk factor for lung cancer development and the leading cause of preventable death [8].

## Patients and Methods

Babylon governorate located in the middle of Iraq is about 100 , kilometers south Baghdad city and has an area of 5,119 Square Kilometers, and population of 1.931.700 people in 2014.

A case – control study was conducted on patients attended Murjan medical city , Babylon oncology center throughout the period from 8th of may to 2nd of september 2019 .

**Sampling :** convenient sample that including all a available patients .

Case: was diagnosed by specialist and referred to the center .

Controls: were age and sex matched .

First degree of family history is defined as a family member who shares about 50% of their genes with a particular individual in a family , first degree relatives include parents, offspring and siblings[9] .Second degree defined as someone who shares 25% of persons genes, it includes uncles, aunts, nephews, nieces, grandparents, grandchildren, half- siblings, and double cousins[10]. Current smokers: is ever smokers who are still smoking at the time of the interview[11].Its including Number of cigarettes smoking per day , and age at beginning of cigarette smoking in years and duration of smoking , number of cigarettes smoking per day [11] .

**Data collection technique :**

Data for lung cancer patients risk factors were collected by direct observation using a structured questionnaire after reviewing previous studies.The questionnaire consists of demographic characteristics of patients, risk factors include(smoking, radon ,family history, first degree of family history is defined as a family member who shares about 50% of their genes with a particular individual in a family , first degree relatives include parents, offspring and siblings [9] .Second degree defined as someone who shares 25% of persons genes, it includes uncles,aunts,nephews, nieces, grandparents, grandchildren, half- siblings, and double cousins[10] .

**Measurement of radon :** Radon gas was measured in bed rooms of patients, in cooperation with Babylon environment directorate by using alphaguard professional radon monitor ,a modern device used to examine radiation and especially to measure the value of radon gas, normal value of radon is 100Bq/$M^3$ according to( WHO)[12].

## Statistical Method

Data were presented in simple measures of frequency, percentage , mean, standard deviation, and range(minimum- maximum values).The significance of difference of different means (quantitative data) , and odd ratio, confidence interval around odd ratio [13] .

**Statistical analysis :**

Data analysis was carried out by using the Statistical Package for Social Science (SPSS/ version 25). **Finding:** A total of 203 cases were include in the study :

**Table 1 : Family history of cancer among cases and controls.**

| Variables | | (Cases) | | Controls | | OR | 95% C.I | P-value |
|---|---|---|---|---|---|---|---|---|
| | | No. | % | No. | % | | | |
| Family History of Lung Cancer | First degree | 8 | 3.9 | - | - | 8.69 | 0.08-70.03 | _ |
| | Second degree | 9 | 4.4 | 1 | 0.5 | 9.77 | 1.23-77.89 | 0.009 |

***Cont...*** **Table 1 : Family history of cancer among cases and controls.**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No family history | | 186 | 91.6 | 202 | 99.5 | Reference | Reference | _ |
| Family History of other Cancer | First degree | 8 | 3.9 | 3 | 1.47 | 3.23 | 0.84-12.40 | 0.071 |
| | Second degree | 40 | 19.7 | 12 | 5.9 | 4.04 | 2.05-7.98 | 0.0001 |
| No family history | - | 155 | 76.4 | 188 | 92.6 | Reference | Reference | _ |

**Table 1** showed that 8.3 % of lung cancer patients had a family history of lung cancer of which first degree were 3.9 % , and second degree were 4.4 % .The percentage of lung cancer who had a family history of other cancer was 23.6% of which 3.9% were first degree and 19.7% were second degree.

**Table 2 : Association of smoking with lung cancer** .

| **Smoking Habits** | **Lung Cancer (cases) 203** | | **Controls 203** | | **OR** | **95%C.I** | **P.value.** |
|---|---|---|---|---|---|---|---|
| | **No.** | **%** | **No.** | **%** | | | |
| Current smoker | 154 | 75.8 | 140 | 69 | 3.07 | 0.65 -2.47 | 0.496 |
| Passive smoker | 32 | 15.7 | 42 | 20.7 | 0.94 | 0.43-2.07 | |
| Not smoker | 17 | 8.5 | 21 | 10.3 | Reference | Reference | |

In table 2 showed that 75.8% of lung cancer patients were current smoker .The risk of lung cancer in current smoker is 3 times more than in the non smoker .

**Table 3 : Association of other risk factors with lung cancer in the studied sample.**

| **Risk factors and duration of exposure** | **Lung cancer (Cases) 203** | | **Controls 203** | | **OR** | **95%C.I** | **P- value** |
|---|---|---|---|---|---|---|---|
| | **No.** | **%** | **No.** | **%** | | | |
| Asbestose exposure | 25 | 12.3 | 8 | 3.9 | 3.42 | 1.51-7.79 | 0.002 |
| Duration (years) | 13.8± 6.9 (2 - 33) | | 12.6± 2.4 (9- 17) | | 0.628 | | |
| Beryllium exposure | 46 | 22.7 | 18 | 8.9 | 3.01 | 1.68-5.41 | 0.0001 |
| Duration (years) | 16.6± 5.8(7 -29 ) | | 18.9± 7 (11- 32) | | 0.177 | | |
| Cadmium exposure | 11 | 5.4 | 2 | 1 | 5.76 | 1.26-26.32 | 0.011 |
| Duration (years) | 9.5± 3.4 (3 - 14 ) | | 8.5 ± 4.9(5- 12) | | | | |
| Chromium exposure | 9 | 4.4 | 4 | 2 | 2.31 | 0.70-7.62 | 0.159 |
| Duration (years) | 12.1 ± 6.6 (5 -28) | | 12.8 ± 1.3(11- 14) | | 0.855 | | |
| Diesel exposure | 27 | 13.3 | 7 | 3.4 | 4.30 | 1.83-10.11 | 0.0001 |
| Duration (years) | 9.8 ± 5.2(3 -27) | | 7.9 ± 2.9 (4 - 12) | | 0.361 | | |
| Others * | 31` | 15.3 | 26 | 12.8 | 1.23 | 0.70- 2.15 | 0.475 |
| Duration (years) | 14 ± 11.2 (2-52) | | 12.5 ± 7.1(4 -34) | | 0.558 | | |

***** Others include those who were works in brick factories ,spray pesticide and chemicals , exposure to agricultural chemical wastes, individuals that presence in area of asphalt plant and generators worker.

Table 3: Showed that (22.7 % , 13.3% , 12.3 % and 5.4 % ) were exposed to (beryllium ,diesel exhaust ,asbestose and cadmium) respectively , and the association were significant .

Figure 1:This figure showed the radon value in (77) patients of lung cancer. All values of radon were within exceptable limit .The duration of exposure 21.2±6 range (5 - 32 ) P.value 0.0001.

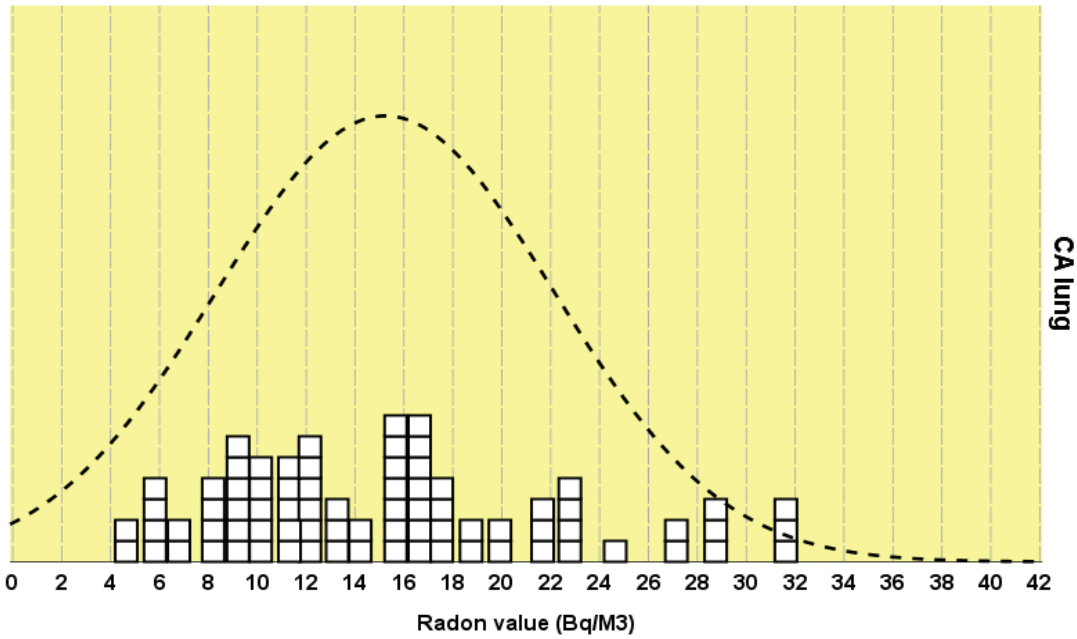


**Figure 1 : Distribution of radon value of lung cancer patients .**

## Discussion

Regarding the age , the results of this study demonstrated highest percentage ( 43.3%) of cases in age group (60 – 69 )years.

Higher percentage of males 69.5 % had lung cancer. This study agrreed with others studies that showed: increase risk of lung cancer in smoking persons more than non-smokers, and in male more than females and in the age groups (50 years and above) [14,15] . This may be due to higher percentage of smoking in males , passive smoking , type of occupational exposure and other risk factors are more in the males than in the females.This study demonstrated the risk of lung cancer in the current smoker were three times more than non smokers, which was supported by other studies, that indicated that cigarette smoking plays an important risk factor in the occurrence of lung cancer [16].The current study revealed that 71.4% of cases were living in rural area, which agreed with the study of Stamm *et al.,*2007, which found that lung cancer was more in rural area than in urban area .[17]

This showed that the 22.7 % , 13.3% , and 12.3 %, there was a significant between lung cancer and exposed to beryllium , diesel exhaust and asbestose . The results agreed with others studies . These studies found that occupational exposure including radon exposure, and asbestos, beryllium, cadmium, chromium, diesel exhaust are constitutes a leading risk factors for lung cancer according to the type of occupation[18,19] .There was a significant association between lung cancer patients and first degree family history lung cancer .Lung cancer patients had 8.7 times more family history of first degree patients with lung cancer. That was in agreement with a study that found brothers, sisters, and children of people who have had lung cancer may have a slightly higher risk of lung cancer themselves, especially if the relative was diagnosed at a younger age. It's not clear how much of this risk might be due to shared genes among family members. [20].

There were many limitations for this study . Firstly : The sample was convenient which included all available cases at the time of the study ,so we not able to include all cases .

Secondly : Measurement of radon was done for (77) patients only , which not reflect the total exposure for all patients . This because there was only one radon gas measurement device available in the directorate of environment of Babylon , and the far distance between houses of patients .

## Conclusion

This study revealed that males, age group 60 and above, rural area and smoking is the main risk factors of lung cancer in Babylon city .There is highly significant association between smoking habits and lung cancer cases p-value<0.05.

**Conflict of Interest :** none

**Source of Funding :** self

**Ethical Clearance :** From patients and babel health directorate and my college .

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# Preparation & Characterization of Some Poly Ester-Amide as Drug Polymers

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## Abstract

In this research,lactide was synthesized by ring opening polymerization then reacted with amino acid to obtain drug polymer,poly (ester-amide)by condensation polymerization at 90C˚with mixture DMF&dioxane(1:1),then the biodegradable polymers substituted by some hydroxyl drug units such as 3-hydroxy pyridine .The action of polymeric drugs depends on hydrolytic & cleavage of the drug moiety from the polymer,this give advantage of late & sustained release of drug over long time with decrease of side effects .The new polymers wich has bioactive group's moiety were measured physical properties and characterized by FTIR & UV spectroscopy and TG thermogram.

***Keywords:-*** *lactide ; aminoacid ; biodegradable ; polymeric drugs*

## Introduction

Human health is threatened by autoimmune,neurodegenerative,metabolic and cancer disease ,just to mention a few,which are difficult to treat with systemically ,delivered drugs[(1)] .Conventional pharmacotherapy involves the use of drugs whose absorption and therefore bioavailability dependes on many factors , such as solubility , molecular weight , number of bonds per hydrogen atom of the molecule ,and chemical stability , all of wich can hinder the achievement of therapeutic response [(2,3)].

Research is being conducted into new formulations that ensure a greater pharmacological response , which in turn would lead to lower doses and therefore the minimization of side effects .Thus , it is necessary to improve the bioavailability of drugs .Bioavailability is affected by several factors ,including the physical and chemical characteristics of the drug [(4)],the dose and concentration , the frequency of dosing , and the administration route.

Therefore ,research into drug delivery systems seeks to improve the pharmacological activityof drugs by enhancing pharmacokinetics (absorption,distribution,metabolism and excretion) and also by amending pharmacodynamics ptoperties , such as the mechanism of action , pharmacological response , and affinity to the site of action[(5)]

Hence , the main function of polymeric carriers is to transport drugs to the site of action .Drugs are protected from interacting with other molecules which could caise a change in the chemical structure of the active ingredient causing it to loose its pharmaceutical action [(6,7)].Moreover , polymeric carriers avoid the intreraction of the drug with macromolecules .

In the case of biodegradable polymers , another option to consider in their design is the chemical structure of the polymer (degree of hydrophobicity , covalent bonds between monomers ,etc.),sincs the speed and degradation condition , and therefore , the rate and site of drug release,can be modulated depending on the chemical structure of the polymer used[(8)].

If the polymer is not biodegradable , the drug can be covalently attached to the polymeric structure by a linker which can be degrade d under different conditions such as in an acidic medium or by different enzymes[(9)] .On the other hand , targets can be bound covalently to the surface which will help the directionality of the vector to the site of action.

Lactide is iactone cyclic di-ester.,Tow molecules of lactic acid can be dehydrated to lactide,a cyclic lactone avarity of catalysts can polymerize lactide to either[10] heterocic or syndiotacticpolylactide[11].

Lactide is one of the most promising biodegradable polymers (biopolymers).The basic aim of prodrug designs to eliminate undesirable drug properties,such as low solubility in water or lipid membrane,low target selectivity,chemical instability [12],undesirable taste,irraitation or pain after local administration,pre systemic metabolism and toxicity .

## Materials & Methods

Glycine,arginine,3-Hydroxy pyridine ,ether,zincpowder,NaOH,dioxane, and lactic acid were purchased fromAldric,Dimethylformamide was purchased from Merck.

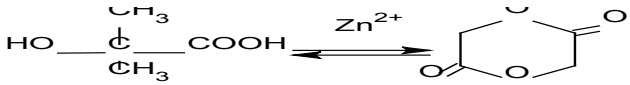
FTIR spectra were reached by (4000-900)$cm^{-1}$ on shimatau spectrometer using KBr pellet .

Ultra violet spectra were recorded using Shimadzu (UV-Vis)-160 , TGA and DTG were performed using CINTRAS-UV[13].

**Synthesis of L-lactide (P1):-**

The synthesis of l-lactide was carried out according to the procedure that was reported by Bendix with some modification including the use of Zn as catalyst.

Lactic acid (88gm,0.97mole)and zinc powder (0.44gm,0.0146mol.) were added to 100 ml round bottom flask containing magnetic stirrer and the mixture was stirred for 15 minutes,then the reaction was placed in a sand bath at 130C˚and the temperature raised to about 200C˚with continuous stirring under vacuum pressure for four hr.Theflsk content was left to cool down to room temperature with a continuous stirring until colorless viscous material was formed,chloroform (100ml)was added to the reaction flask,and then the content of the flask transferred to a separate funnel,washed by (45ml) of NaOHsolution.The organic layer was received and the solvent removed under reduce pressure [14,15],a light yellow viscous was collected with yield 70% and softening point 270C˚.




**Poly condensation of some amino acids with poly lactide(P2,P3) :-**

(1 mole,1.19gm) of prepared lactide was dissolved in (5ml) mixture of dioxane and DMF (1mole,2gm)of amino acid such as glycine was added ,the mixture was heated to 90C˚for 1 hr .The brown product was washed with ether and was dried at 50 C˚in vacuum oven, rigid product .

Modification of prepared polymers with heterocyclic compound(P4,P5).

(1.7gm,0.014mole)of 3-hydroxy pyridine was dissolved in( 1ml)DMF and (10ml)dioxane,the (2gm,0.014mole)of preparing polymers (P2,P3) which dissolved in (1ml)DMF and (10ml)dioxanewas added with stirring in flask equipped with condenser , then reflexed 3hr.The solvent was evaporated under vacuum,the substituted polymers were washed by ether for several times and dried,physical properties .

## Finding

Recently ,studies on biodegradable polymers has increased in importance due to wide range of biomedicine applications an addition to packaging and agriculture applications .(lactide importance) in the present study lactate polymers which have biological activities was prepared studied .

FTIR spectrum of lactide(P1) shows the absorption of (C=O)ester in( 1724)$cm^{-1}$, the absorption of (C-O) was appeared at (1207)$cm^{-1}$,finally,the absorption of (C-H)aliphatic was appeared at (2943)$cm^{-1}$,(2887)$cm^{-1}$, figure 1.

FTIR specrum of (P4) shows absorption of bands at (3377)$cm^{-1}$due to (OH) group of remaining carboxylic acid ,(1732)$cm^{-1}$due to (C=O)este,(1300)$cm^{-1}$(C-O) estere ,(1651)$cm^{-1}$due to (C=O)amide ,(3522)$cm^{-1}$due to (NH)and at last , figure shows absorption bnnds of (C-H) aliphatic at (2026)$cm^{-1}$,(2856)cm,$^{-1}$figure2.

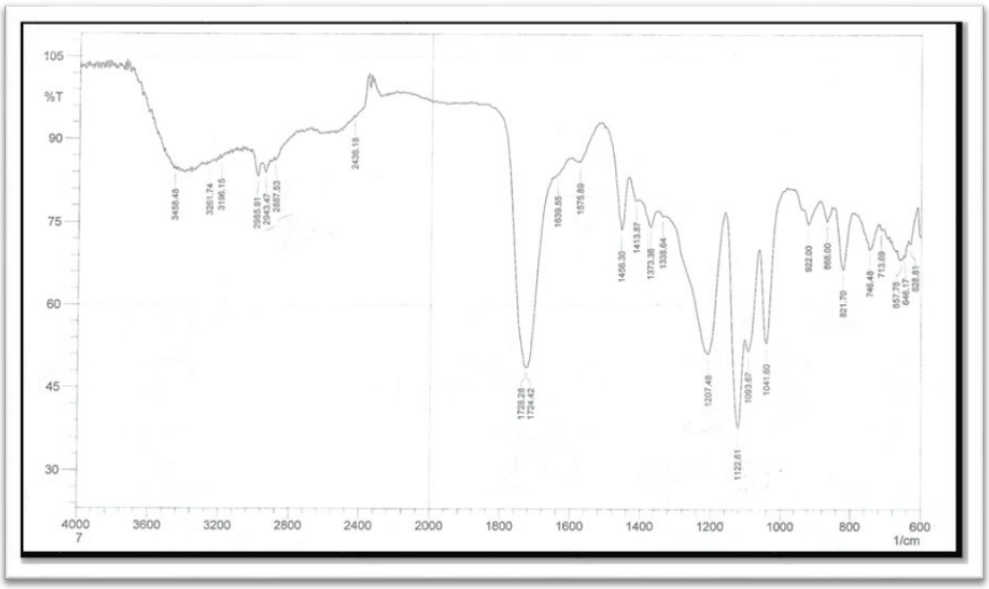
FTIR specrum of (P5)shows absorption bands at (3308) $cm^{-1}$due to (OH) group of remaining carboxylic acid ,(1734)$cm^{-1}$due to (C=O)ester ,(1307)$cm^{-1}$ due to

(C-O)ester ,(1647)$cm^{-1}$due to (C=O)amide ,(3290)$cm^{-1}$due to (NH)and at last ,we can see also absorption bands at (2928),(2870)$cm^{-1}$due to(C-H) aliphatic, figure3.

ultraviolet spectrum of (P5) shows an absorption band at (280)nm,figure4.

The thermal stability of the prepared polymer(P1) was investigated by thermogravimetric analysis (TGA).This technique is based on measuring the weight loss as a function of time at constant temperature and a function of tempreture at constant rate of heating . In the present study, the thermal stability of the prepared polymer was tested by measuring the sample weight as a function of temperature Figure5. The thermal measurement gave valuable information about thermal stability of the prepared compound in four steps of weight loss-temperature .This high thermal resistance indicated the high molecular weight of the prepared polymers with high interaction between hydrogen bonding through the polymer chain.

The weight loss of P2,P3 were measured as a function of temperature which gave valuable information about the thermal stability of the P2,P3 polymers as shown in, figure6.




Figure(1) : FTIR spectrum of P1

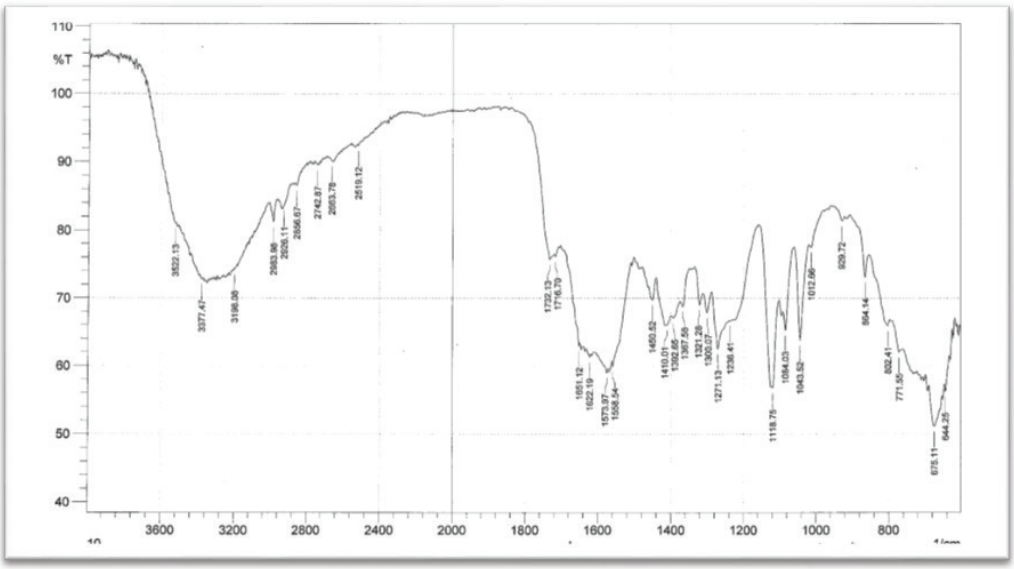



**Figure (2) : FTIR spectrum of (P4)**

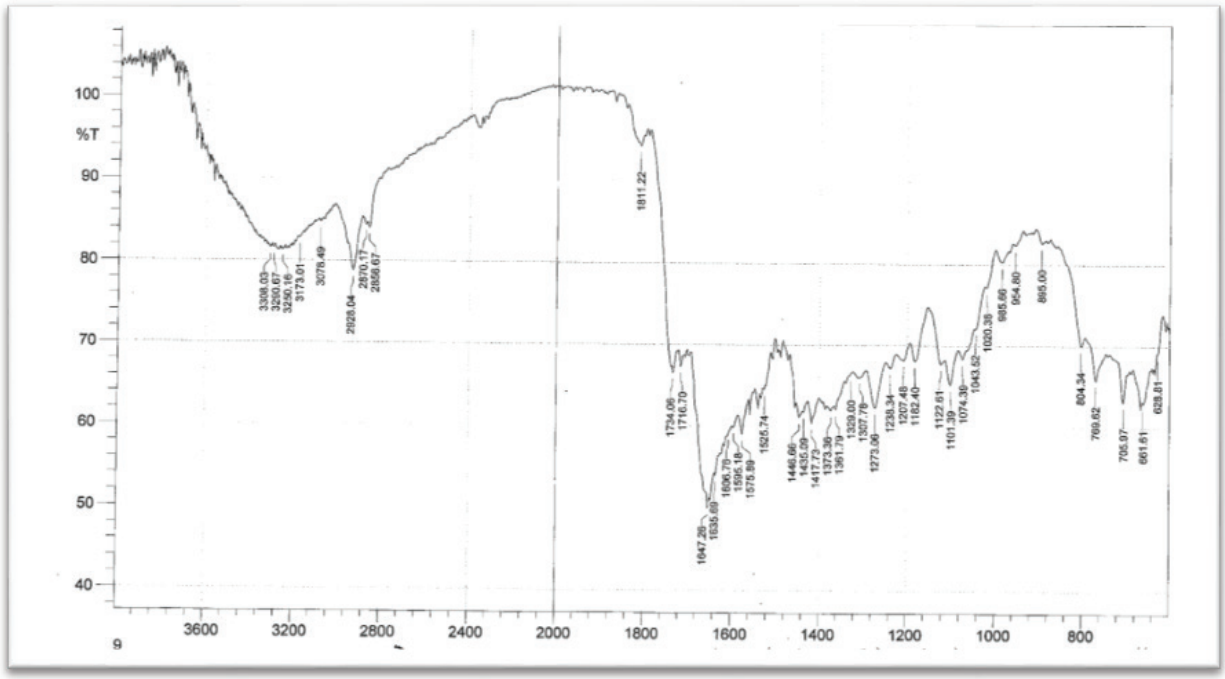
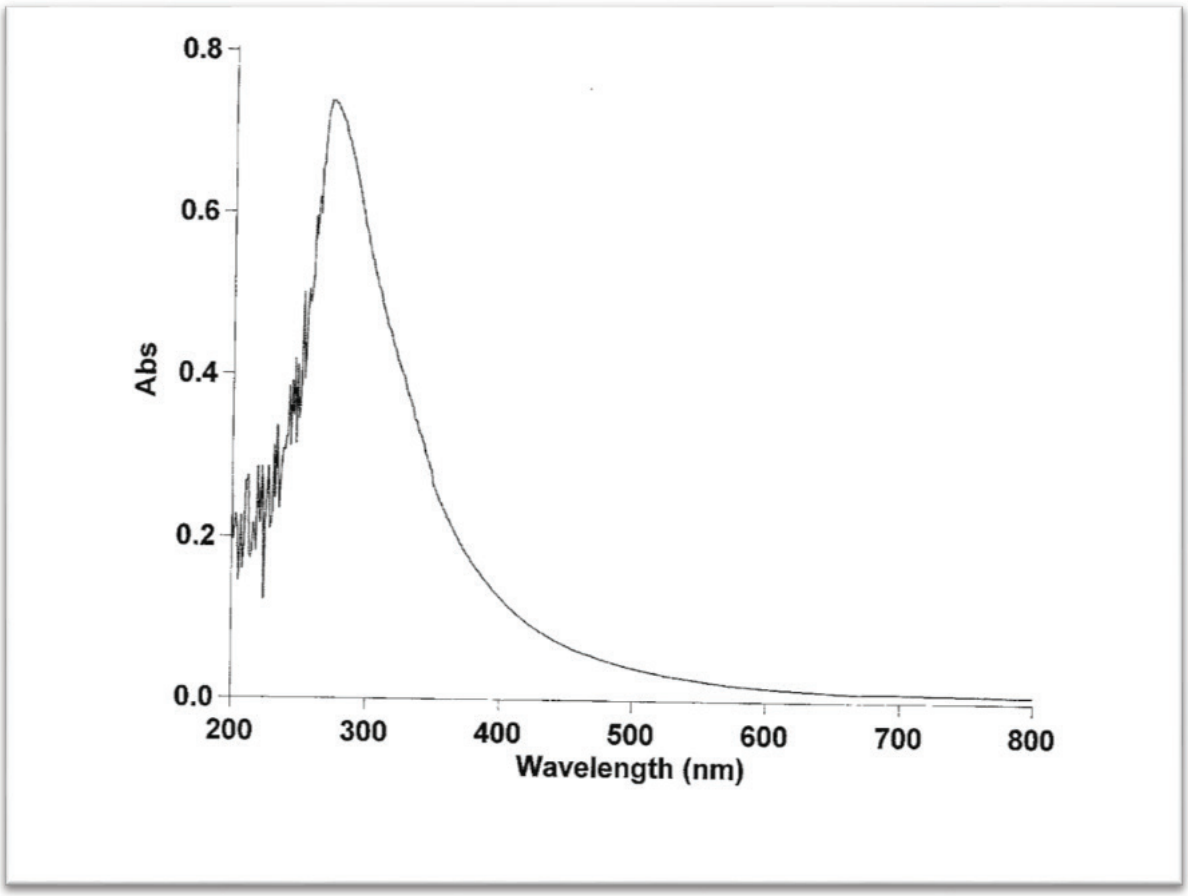



**Figure (3) : FTIR spectrum of (P5)**




Figure(4): Ultraviolet spectrum of P5

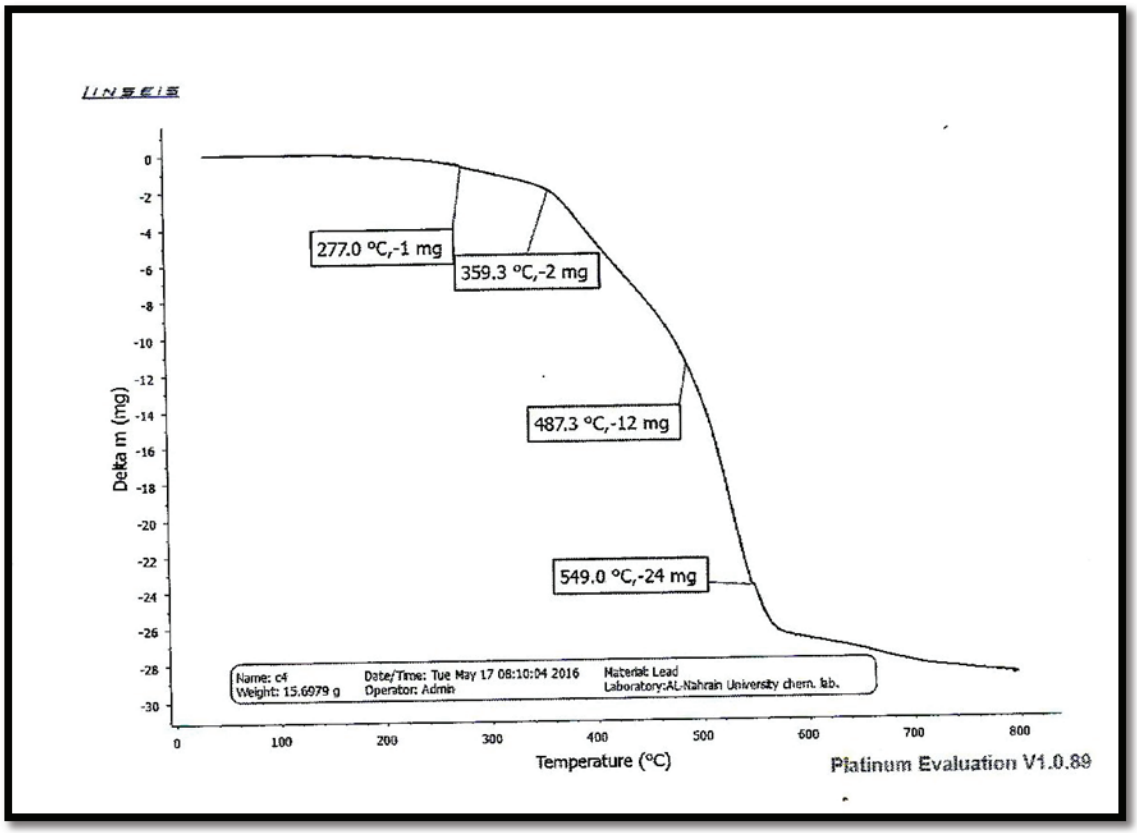



**Figure (5) : thermal stability measurement of P1**

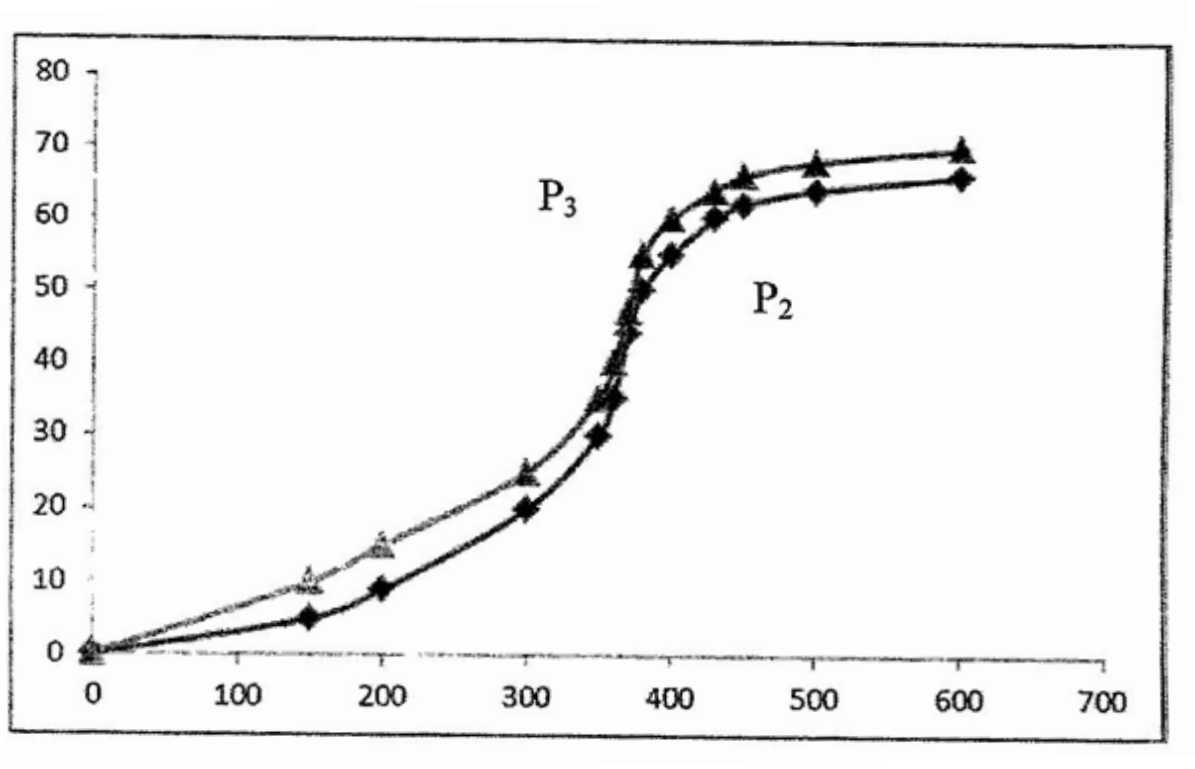



**Figure (6) : Thermal stability measurement of P2,P3**

**Conflict of Interest :** None

**Source of Funding :** Self

**Ethical Clearance :** From my college .

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# Correlated of Some Parameters of Placenta and Umbilical Cord with the Newborn Baby

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## Abstract

**Background** :umbilical cord is a fetomaternal tubular organ; it has been described as "dairy of intrauterine life"; this remarkable organ responsible for living of the bay for about 266 days, Where the source of food and oxygen from the mother to the fetus as well as the disposal of waste. **Patients and methods :**209 umbilical cord and their placentae were studied thoroughly and the mothers ages were 15 -< 45 years old .The length and diameter of the umbilical cord, Wharton's jelly ,placental weight and umbilical cord insertion were measured .The babies weights were measured and their gender were assigned. **Results**: current study showed the umbilical cord parameters (length and diameter) have no correlation to mothers' age groups only in the length and diameter means there were Simple drop in group 1(15_19 year old) and the diameter group 7 (>45 year old ).The umbilical cord knots percentage was normal in comparison to other studies. The study of Wharton's jelly were correlated with baby's weight was significant, whenever baby weight increases the Wharton's jelly increase. And when the Wharton's jelly Correlate with placenta weight in gm. There was significant correlation.

***Keywords :*** *placenta; umbilical cord; newborn baby.*

## Introduction

Plenty of inventions have been made by human beings beside mind and inspiration had made high influence, but the most remarkable development of all is a human being; how human come to be. In particular, the development of a new human life heavily depends on umbilical cord and placenta, an organ whose anatomy and histology ensure the nourishment of a developing baby [(1).]

The umbilical cord is thin, long tube-like structure that is needed to form a connection between the fetus and the placenta in the mother's uterus. To provide sufficient and effective circulation of the blood to the growing fetus, the umbilical cord has one vein which carries oxygenated rich blood and two arteries which carry deoxygenated blood. These three blood vessels coil around in a helical Configuration to form the umbilical cord or the umbilical cord is a helical and tubular blood conduit connecting the fetus to the placenta [(1).]

Umbilical cord achieves its final form of development by the 12$^{th}$ week of gestation and normally contains two arteries and a single vein; all embedded in Wharton's jelly (Figure 1) [(2).]

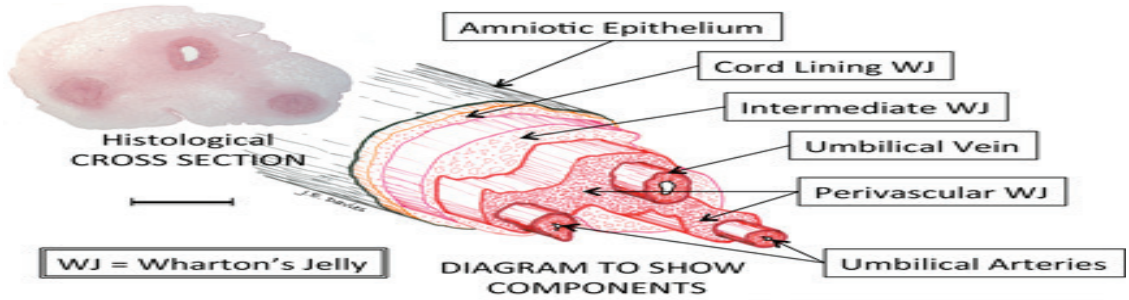


**Figure 1: Diagram of umbilical cord at term**

At term the umbilical cord has an average length of 43–94.5 cm (3). The umbilical cord arteries and vein are unlike their counterparts in the remainder of the foetal body as the umbilical cord vein transports oxygenated blood to the fetal heart, while the two arteries return oxygen-depleted blood to the placenta[3].

Umbilical cord is physiologically and genetically part of the fetus and (in humans) normally contains two arteries (the umbilical arteries) and one vein (the umbilical vein), buried within Wharton's jelly. The umbilical vein supplies the fetus with oxygenated, nutrient-rich blood from the placenta. Conversely, the fetal heart pumps low oxygen containing blood, nutrient-depleted blood through the umbilical arteries back to the placenta[4].

The aim of the study is to find umbilical cord parameters (length and diameter) by using gross anatomical study and calculate the Wharton's jelly in umbilical cord and find the knot of umbilical cord.

## Materials and Method

During the period from March 2018 till Jun 2019, more than 209 placentas with its umbilical cord were collected from deferent labor room after vaginal delivery or theaters room after Caesarean section in Gynecology and Obstetrics department from various provinces like Kirkuk and salah-aldin, samples have been studied anatomically. 120 placenta and umbilical cord were collected from the delivery room in Bejei hospital these examined anatomically , and 89 placenta and umbilical cord were collected from delivery room in Kirkuk teaching hospital these were examined anatomically .

Regarding the mothers ages they were divided into 7 age groups (Group 1 – Group 7 ) with 5 years interval , starting from 15 - > 45 years old , and number of placenta and umbilical cord collected according to the mother's age groups.

**Anatomical study of the placenta and their Umbilical cords**

Regarding the placenta and umbilical cord after delivery and their separation from the babies, they were placed on a towel, cleaned and then studies anatomical gross by tape measure and the data were mentioned in and according to a questioner paper done for each mother.

In the beginning the placenta were weighted and baby's weighing device present in the delivery room , so the placenta and baby's weights in grams were measured by the same weighing device .

Regarding the umbilical cord , the type of their insertion to the placenta were mentioned ,then their lengths were calculated in which after delivery of the baby the umbilical cord is clamped at two sits one near the baby and other near the mother then cut to handle the baby and taken for further management , waiting for the delivery of the placenta from the mother which occurs about 10 min later and sometime up to 30min , so the length of the umbilical cord was measured with flexible rubber length gauge and the summation of three measurements , one from the placenta to the clamped site , the other from the baby to the other clamped site and the last between the two clamping sits by the tape measure.

The umbilical cord diameters were measured in centimeters by the Vernier.The umbilical cord knots were calculated regardless their type whether true or false knots.

**Measuring method of Wharton's jelly:**

This study Included 54 women who visited the Tikrit Teaching Hospitals maternity department and Kirkuk Teaching Hospital's maternity department and pregnancy at 37–42 weeks of gestation. Gender, gravity, parity, weight gained during pregnancy and gestational age verified by the last cycle of menstruation or first trimester ultrasound were reported for each subject or EDD. The umbilical cord with three intact vessel structures was collected after delivery of the vaginal or cesarean section and after proper separation of the placenta.

Was cut 5 centimeter from the umbilical cord is cut by a Sharpe scalpel approximately 30 cm from the attachment of the umbilical cord to the placenta. Place the specimen in a normal saline solution, then clear the blood vessels from blood and measure the sample by sensitive balance with tolerance to 0.01 g. In individual containers, cord parts are incubated in 10% formaldehyde for 10 minutes.

The section of the cord was weighed again after removal and drying Smoothly isolated the cord vessels and membranes from the jelly of the Wharton's and the weight of the Wharton's Jelly was obtained using a scalpel. The volume of the Wharton's jelly was measured by calculated the amount of water displaced in a volume measurement jar when the Wharton's jelly was placed. Wharton's jelly density [Wharton's jelly (g)/water (mL)] was calculated.

## Findings

The umbilical cord is appeared flexible, tube-like structure that has a spongy appearance, smooth, surrounded in a jelly-like substance, color yellowish-green. Conduit between the fetus and the placenta.

(Usually the umbilical cord lining membraneextension of the amniotic membrane covering the placenta. The umbilical cord lining membrane comprises two layers: the amniotic (or epithelial) layer and the sub-amniotic (or mesenchymal) layerand inside of umbilical cord gelatinous fluid called Wharton's jelly. It comprises two arteries (the umbilical arteries) and one vein (the umbilical vein).Figure 2

**Figure(2): Umbilical cord**

The following parameters were inspected and measured in the umbilical cords shown in (Table1 ).According to the mothers age groups ,there were no differences in umbilical cord length means only in the length and diameter means there were Simple drop in group 1(15_19 year old) and diameter in group 7 (>45 year old ) as shown in ( Table 2) .

**Table (1) parameters of umbilical cord**

| parameter | frequency | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Cord length | 209 | 43.00 | 94.50 | 63.49 | 7.00 |
| Cord diameter | 209 | 0.3 | 2.50 | 1.31 | .46 |

**Table (2) Mean of cord length and cord diameter by mean age group.**

| Age group | frequency | Cord length | | Cord diameter | |
|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Mean | Std. Deviation |
| 14-19 | 44 | 62.84 | 6.59 | 1.18 | 0.44 |
| 20-24 | 42 | 63.44 | 6.36 | 1.38 | 0.40 |
| 25-29 | 43 | 63.83 | 6.63 | 1.37 | 0.49 |
| 30-34 | 39 | 64.53 | 7.89 | 1.37 | 0.51 |
| 35-39 | 21 | 64.33 | 7.37 | 1.35 | 0.45 |
| 40-44 | 12 | 63.08 | 8.39 | 1.39 | 0.38 |
| 45- | 8 | 64.25 | 8.34 | 1.33 | 1.33 |

The following the result emerged after part of the umbilical cord was taken (5 cm) ,Mean of Wharton's jelly weight in gm. 4.92±0.84g ,and mean volume 3.53±0.87ml .The mean Wharton's jelly density 1.45±0.98 gm./ml( table 3).

**Table (3) values of Wharton's jelly at 5 cm weight, volume and density.**

| Item | Mean±SD | maximum | Minimum |
|---|---|---|---|
| Wharton's jelly weight in gram | 4.92±0.84 | 6.21 | 3.35 |
| Wharton's jelly volume in ml. | 3.53±0.87 | 5.41 | 1.80 |
| Wharton's jelly density in gm/ml | 1.45±0.98 | 2.46 | 0.98 |

The mean Wharton's jelly weight in gm. were Correlated with mean babies weight there was significant correlation, whenever baby weight increases the Wharton's jelly increase ,also The mean of Wharton's jelly in gm. were Correlated with Mean of placenta weight in gm. There was significant correlation ( Table 4).

**Table (4) Correlation between means Wharton's jelly weight and mean of baby weight and Mean of placenta weight**

| Mean of baby weight | Mean of Wharton's jelly weight in gm. | Correlation | p.value |
|---|---|---|---|
| 3.22±.51 | 4.92±0.84 | 0.895** | S. |
| 640.72±51403 | 4.92±0.84 | 0.290 | S. |

S: Significant

## Discussion

In this research the umbilical cord parameter was studied anatomically (length and diameter) in this study the mean length of umbilical cord was 63.49 and in a range 43-94 cm, while the mean diameter was 1.31 cm. and in a range 0.3-3.50cm.in its diameter; these values and range studied and provide by shipp *et al.,* [5] weeks [6] , Krakowiak *et al.,* [7].

In this work , there was no correlation of the mean umbilical cord length with mother age groups while the diameter means there were decreases in group 1(15_19 year old) and group 7 (>45 year old ) .

The umbilical cord knots were present in about 5.3 %, this disagrees with the percentage in European countries were the percentage is about 1% only which was studies by Karina *et al.,* [8]. The Wharton's jelly was calculate in 54 women in 5 cm. the men Wharton's jelly weight 4.92±0.84 gm. in the range 3.35- 6.21 gm. , men Wharton's jelly volume 3.53±0.87 ml .and in a range 1.80-5.41 ml. the mean density of umbilical cord was1.45±0.98 ml/gm. and the range 0.98 - 2.46 ml/gm. and the men Wharton's jelly weight was correlated with the mean baby weight in gm. and with mean of placenta weight gm. this agrees with study in Turkey by Filiz [9].

The study of babies' weight is Shows, mean of babies weight was 3.22±0.51 gr. And this value correlated with the mean placental weight, is significant, whenever the babies weight increase their placental weight also increase this is proved by Sultan *et al.,* [10] and Kaplan[11].

The correlation between mean baby's weight and mean length and mean diameter of umbilical cord was non-significant .that was disagree to what has been claimed by Rio *et al.,* [12] who said that there is a significant relation found between umbilical cord length and diameter with baby weight .in the correlation between baby gender with the umbilical cord length and diameter was no significant .This has been supported by the study in Columbia University,USA by Mills *et al.,* [13].

## Conclusion

1) The best parameter regarding the umbilical cord, both grossly and ultrasonography, found in the mothers aged between 20-35 years old, which reflected on their babies' weight and health.

2) Umbilical cord parameter does not correlate with the maternal age, including umbilical cord length and diameter of umbilical cord.

Umbilical cord knot presence is randomly not dependent on the age of the mother; only the length of the umbilical cord sometimes affects the presence of the node; the longer the umbilical cord, the more likely the nodes are present. *Wharton's jelly weight (in gram) was correlated with mean baby weight; there was a significant correlation, whenever baby weight increases the Wharton's jelly increase. When correlated with mean of placenta weight (in gram), there was significant correlation, whenever placenta weight increases the Wharton's jelly increase.

**Conflict of Interest :** none

**Source of Funding :** self

**Ethical Clearance :** From patients and my college .

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# Treatment of Retained DJ(neglected DJ) in AL-Anbar Government, A Postconfict Study

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## Abstract

Double J ureteral stents have been used to relieve or improve drainage in cases of ureteric obstruction from any causes (intrinsic or extrinsic). These forgotten or retained ureteral stents could lead to many complications. The objective of the paper is to assess the methods that used for treatment of neglected double Jamong displaced persons. Across section study was done, 28 patients with neglected double J stent were chosen from urology departments in Al-Ramadi & Al-Fallujah teaching hospitals. **Result:** Out of total (28) , 20 (71.4%) were males while females were 8 (28.6%) of the sample. The indication of insertion varied between 13 (46.4% ) patients after Ureterorenoscopy procedure for ureteric stones (10 males & 3 females ) and five (17.9% ) patients due to traumatic causes , four (14.3%) patients due to pyelolithotomy , three (10.7%) patients PNL for removal of renal stone. The complications rare which ranged from fever postoperatively in nine patients (32.1%), two patients (7.1%) suffered from ureteric injury thatmandate double J insertion , three patients (10.7%) required more than two sessions to clear the ureter & remove of retained double J.

***Keywords:*** *Forgotten DJ, complications, Anbar governorate.*

## Introduction

Since their introduction into clinical use for first time in 1967 ,Ureteral stents have been widely utilized for many urological indications.[1]

Double J (DJ) ureteral stents have been used to relieve or improve drainage in cases of ureteric obstruction from any causes (intrinsic or extrinsic). They used also after iatrogenic injuries to the ureter during ureterorenoscopy (URS) and also after various operation in ureter &renal pelvis .[2]

Over the last years &with improvement in technology of stent material &design , the patient complaint from DJ will decrease . As a result, DJ stents have been left in place for a longer duration of time.[3]

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These forgotten or retained ureteral stents could lead to many complications such as up or down slipping , fragmentation, encrustation and stone formation.[4-6].

Encrustations are most frequently noted in forgotten/retained DJ's, that stay in body for longtime. The causes of encrustation is multifactorial. Most common risk factors for encrustation of DJ are long time duration of stenting, urinary tract infection , past history urinary stones disease, such chemotherapy&chronic renal disease.[7]

For remove the severely encrusted DJ stent there is many procedures as (shock wave lithotripsy (SWL), ureterorenoscopy, cystolitholepaxy and even percutaneous nephrolithotomy (PCNL ) or open surgery according to patient condition & site of encrustation..[8,9]

The treatment depend on patient condition (encrustation site ,stone burden ,fragmentation of DJ…. etc),availability of equipment &Endourological tools &

experience of surgeon .

Iraqi health system is suffering due to wars, sanctions and violence. Iraq and Iraqis exposed to widespread violence since 2003 , that violence became a leading cause of death for Iraqi adults after March 2003 and the main cause for men aged 15-59years.[10]

The condition was deteriorated in June 2014 as several governorates in west and north of Iraq especially our governorate (AL- Anbar) were invaded by ISIS , the harm was huge , several reports documentedthat an extensive damage was occurred to the infrastructures of these provinces especially in health and teaching sectors left many hospitals and health care centers became out of work, in addition to that thousands of people were displaced to refugees camps in different regions including Kurdistan -north of Iraq- in which they lack the basic health services, they loss ability to manage their health disorders and they didn't find the special care for emergency conditions such as surgical operations.

So there were many patients neglected (not forget DJ) in there body especially those people who lived in camps for prolong periods might be months or years without receiving heath care.

After end of war & family retuned to AL-Anbar governorate ,the our teaching hospital (AL-Ramadi & AL-Fallujah) were receive many cases of neglected DJ ,&we decided to share our experience to world about this rare conditions.

The objective of the paper is to assess the methods that used for treatment of neglected DJ among displaced persons.

## Material and Methods

Study design and period

Across sectional study was carried out during the period of from March 2017 to April 2019 (after end of war with ISSI) were included in this study.

Sample size and sampling technique

Convenience sample of 28 patients with neglected DJ stent were chosen from Urology Department in Al-Ramadi teaching hospital & Al-Fallujah teaching hospital (in Al-Anbar government )

The inclusion criterion was

1. Patient with more than 6 months duration of the stenting .

2. No malignant obstruction require prolong stenting.

**Data collection procedures and instruments**

Assessment of patients was done via questionnaires that contain age, sex, indication of stenting, chief complaint of patient ,The indwelling time of the stent was measured from the time of stent insertion to time of stent removal, need of preoperative SWL , Procedure required &any complications occur during complications.

Kidney–ureter–bladder (KUB) x-ray and ultrasound of urinary system (US) were performed in all patients to evaluate the patient anatomical details , severity of encrustation, size &site of related stone , and any other complexity of the situation (e.g., broken or migrated stent).

A non-contrast computerized tomography (NCCT) and/or intravenous pyelography were perfumed to selected patient according to availability &if more details are needed.

The preoperative evaluation consisted of : A urine exam .; Blood urea & serum creatinine ; Complete blood picture ; In patients with positive infection in urine exam results, an urine culture performed & intervention was postponed after antibiotic treatment ; Viral screen and Other investigation need according to patient age &comorbidity such as random blood sugar, liver function test ,Echocardiography (ECG) ,…..etc.

All patients received preoperative antibiotic.

Treatment decisions were made on the basis of radiological findings and the clinical findings & availability of various treatment modalities

Patients needed various endourologic procedures under general or local anesthesia in one or more sessions.

To remove the stent and related stone burden, various combinations of the following were used:

1. Extracorporeal Shockwave lithotripsy (ESWL) :was performed using the Siemens Lithostar Modularis

AG Healthcare,

Munich, Germany.

2. Simple cystoscopic stent removal:under local or general anesthesia by cystoscopy 22F for adult & 13F pediatric cystoscopy .

3. Ureterorenoscopy (URS): The URS was done using 6F/7.5F &/ or 9F/12F Storz semirigid

ureteroscopes with using EMS pneumatic lithotripter or A Quanta holmium laser as an intracorporeal lithotripter.

4. Cystolitholepaxy :mourmyers lithotripter for adult & ureteroscopes with using EMS pneumatic lithotripter or A holmium as an intracorporeal lithotripter for children .

5. Open surgery :Pyelolithotomy , Ureterlithotomy .

KUB and urinary system US were used to assess the postoperative residual stone burden. Patients suspected of having residual stones or hydronephrosis were evaluated by NCCT. Patients were considered stone-free if the postoperative imaging studies revealed no residual stones more than 3 mm.

Aim of the study was explained to the participant &written consent was obtained from them.

## Findings

Out of total (28) , 20 (71.4%) were males while females were 8 (28.6%) of the sample.

Age of the subjects was between 5-61years ( mean of 35.25 +- 16.8)

The indication of insertion varied between 13 (46.4% ) patients after URS procedure for ureteric stones (10 males & 3 females ) and five (17.9% ) patients due to traumatic causes , four (14.3%) patients due to pyelolithotomy , three (10.7%) patients PCNL for removal of renal stone . DJ indwelling time ranged between 7-36 months (mean of 16.79+-9.2)

The most presenting complaint was lower urinary tract symptoms(LUTS )which stated by 18 (64.3 %) patients and loin pain was reported by five (17.9%) patients while three (10.7%) patients were asymptomatic.

The results reported that five (17.9%) patients need prior SWL

ospital .

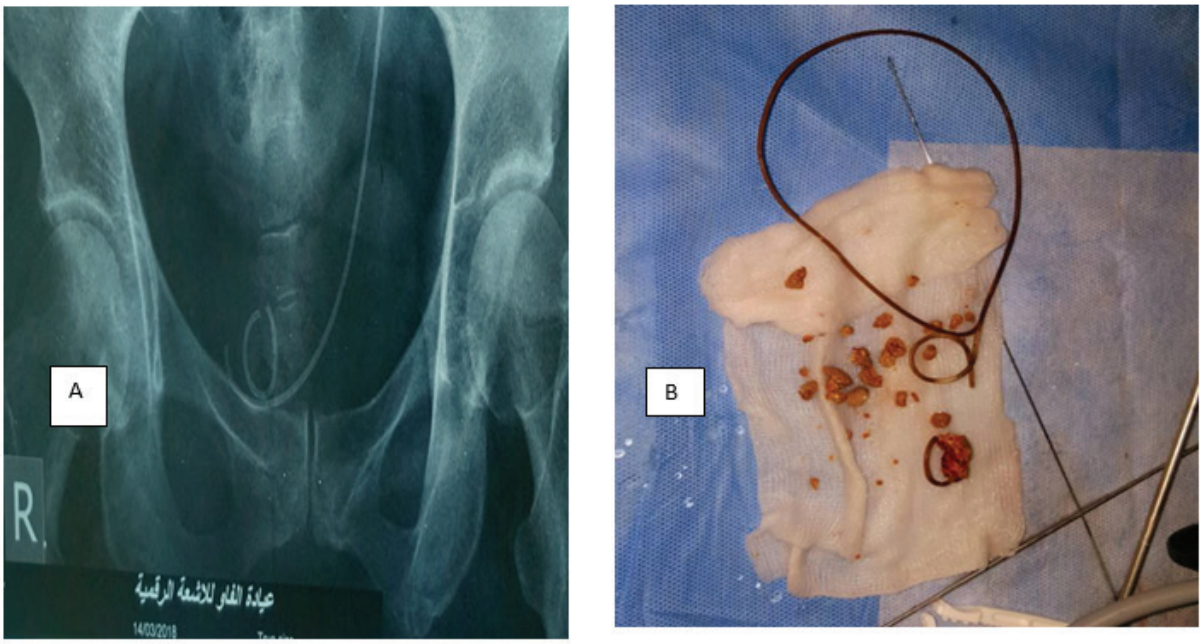


**Figure 1: Female patient with fragmented DJ A. Before Removal B. After Removal.**

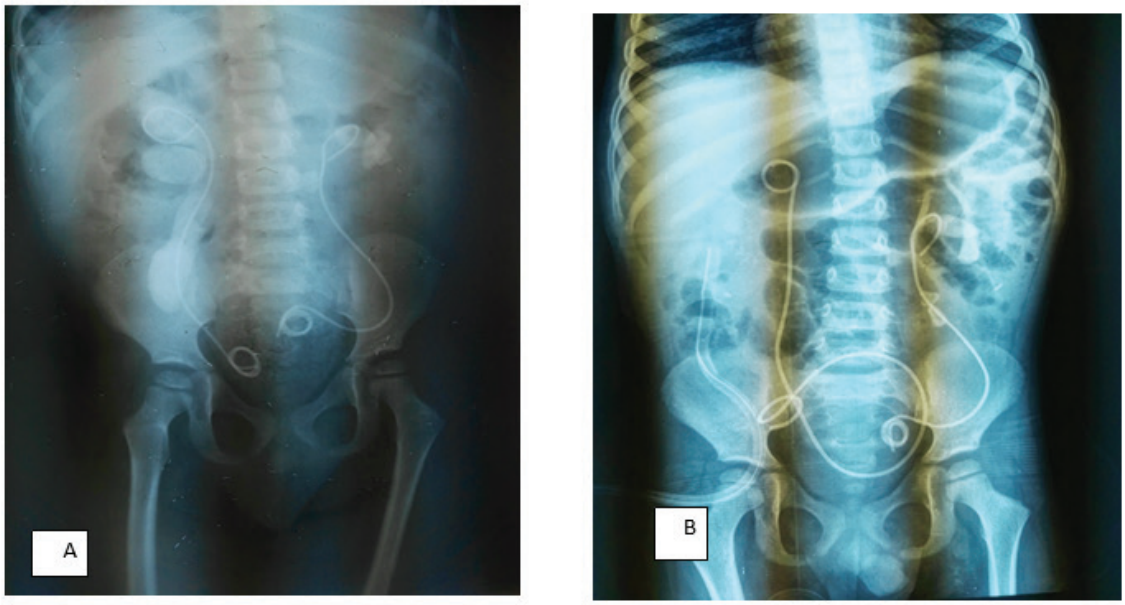


**Figure2: A. Before operation B. After open surgery.**

Regarding procedure, the results showing that 17 (60.7%) patients need URS with laser lithotipsy & one (3.6%) patient underwent URS with pneumatic lithotipsy ,alone or company with cystolitholepaxy in two (7.1%) patients (Table 1).

**Table 1 : Association of gender with indication, complaint ,procedure &complications**

| | | N | % |
|---|---|---|---|
| Indication | PNL | 3 | 10.7 |
| | URS | 13 | 46.4 |
| | Pyelolithotomy | 4 | 14.3 |
| | Trauma (iatrogenic &non iatrogenic ) | 4 | 14.3 |
| | Others | 4 | 14.3 |
| C. complaint | LUTS | 18 | 64.3 |
| | Hematuria | 1 | 3.6 |
| | Flank pain | 5 | 17.9 |
| | Asymptomatic | 4 | 14.3 |
| | Total | 28 | 100.0 |
| SWL | Yes | 5 | 17.9 |
| | No | 23 | 82.1 |
| | Total | 28 | 100.0 |

***Cont...*** **Table 1 : Association of gender with indication, complaint ,procedure &complications**

| | | | |
|---|---|---|---|
| Procedure | Simple cystoscopic stent removal | 6 | 21.4 |
| | Cystolitholepaxy | 1 | 3.6 |
| | URS Pneumatic lithotripsy | 2 | 7.1 |
| | Holmium laser | 16 | 57.1 |
| | Pyelolithotomy | 1 | 3.6 |
| | Ureterolithotomy | 1 | 3.6 |
| | Both | 1 | 3.6 |
| | Total | 28 | 100.0 |
| Complications | Without | 14 | 50.0 |
| | Fever | 9 | 32.1 |
| | Ureteric injury need DJ insertion | 2 | 7.1 |
| | Need multiple sessions | 3 | 10.7 |
| | Total | 28 | 100.0 |

Six (21.4%) patients need only gentle cystoscopy removal by forceps, while three (10.7%) patients need open surgery ,one pyelolithotomy &other uretrolithotmy (Table 1)

& most difficult case was child in 5years old need combined open pyelolithotomy & ureterolithotomy & pneumatic litholepaxy due to huge stone burden in kidney &ureter(Fig 2).

The complications rare which ranged from fever postoperatively in nine patients (32.1%), two patients (7.1%) suffered from ureteric injury that mandate DJ insertion , three patients (10.7%) required more than two sessions to clear the ureter & remove of retained DJ ( Table 1).

In our study we had only one case with fragmented DJ (Fig. 1)

Statistically ,there was non-significant association between gender and procedure required or complications

The results revealed that statistically non-significant association between indications of DJ insertion & type of procedure that required & complications ( Table 2 ).

**Table 2: Relation between indication of DJ insertion &procedure used**

| | | | | | | |
|---|---|---|---|---|---|---|
| | **PNL** | **URS** | **Pyelolithotomy** | **Trauma (iatrogenic &non iatrogenic )** | **Others** | |
| | | | | | | |
| | n | n | n | n | N | P * |

***Cont...*** **Table 2: Relation between indication of DJ insertion & procedure used**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Procedure | Simple cystoscopic stent removal | 1 | 2 | 2 | 1 | 0 | 0.98 |
| | Cystolitholepaxy | 0 | 1 | 0 | 0 | 0 | |
| | URS Pneumatic lithotripsy | 0 | 1 | 0 | 1 | 0 | |
| | Holmium laser | 2 | 6 | 2 | 2 | 4 | |
| | Pyelolithotomy | 0 | 1 | 0 | 0 | 0 | |
| C. Complaint | Hematuria | 1 | 8 | 4 | 2 | 3 | |
| | LUTS | 0 | 1 | 0 | 0 | 0 | 1.62 |
| | Flank pain | 2 | 0 | 0 | 2 | 1 | |
| | Asymptomatic | 0 | 4 | 0 | 0 | 0 | |

*P of chi square test

The findings revealed that statistically insignificant association between time of indwelling DJ &complications.

## Discussion

Although the uses of DJ increasing nowadays &with effectiveness in treatment of many urological problems and prevent many complications but it might be associated with several complications such as LUTS , hematuria ,up or down slipping &encrustation especially in retained DJ .[11]

The encrustation of neglected stents with a severe stone burden is a serious complications due to recurrent infections, hematuria, obstructive uropathy & even renal failure.[11]

Though there has been no definition for "forgotten" as any such term does not exist, but many previous studies consider a variable period of greater than 3 to 6 months to be considered as a forgotten stent.[12]

The treatment of retained or neglected DJ is a challenging procedure &need individualization of cases.

The literature has been shown that poor compliance is the major concern, which leads to forgotten DJ stent in situ[13]

Anbar governorate suffered from invasion of ISSI,thousands of people were displaced to camps without basic health services after end of war they consult our hospital for removal this DJ, the health system suffered from damage of infra- structure &lack of equipments. The patients with DJ were neglected for years. The results revealed that the mean of indwelling time was (16.79+-9.2) months , a study that conducted by Okuda *et al* revealed that the mean indwelling times of these stents was 20 months.[14]& other study reported the mean indwelling time of the DJS was 22.6 ± 30.3 (6–144) months [15]

The maximum DJ indwelling time in literature was 23 years while in our study, the maximum duration was

of 3 years.[2]

The most presenting complaint was LUTS which stated by (64.3 %) patients followed by (17.9%) patients suffered from loin pain while (10.7%) patients were asymptomatic.This finding was inconsistent with results of Damiano et al who observed flank pain in 25.3%, encrustations in 21.6%, LUTS in 18.8%, hematuria in 18.1%, fever more than 104°F in 12.3% and stent migration in 9.5% of the patients.[16] .

The most indication of DJ insertion was (46.4% ) patients after URS procedure for ureteric stones , (17.9% ) patients due to traumatic causes , & (14.3%) patients due to pyelolithotomy while in study of Senol etal were Urolithiasis in 83.3%, hydronephrosis in pregnancy in 9.2% , surgical procedures in ureter in 5.5%, and renal transplantation in 8%.[15]

In the literature,the fragmentation of ureteral stents was 0.3–10%.[4,6] In our findings , the fragmentation rate was 3.57% .

Although there was obvious increase in complication of removal retained DJ with increase of indwelling time but it failed to reach significant statistically may be due to small sample size .

In first step , we did KUB &US to the patients ,if no obvious encrustation we used gentle trial of removal DJ without forces to avoid any complications such as ureteral injury ,this succeed with six patients ,if this procedure failed then we sent the patient to NCCT to evaluated the site of encrustation &stone burden &any other complications, if mild to moderate encrustation that localized to pelvis or upper ureter, we sent him to SWL before endourological procedure done .if encrustation along DJ or in lower end of DJ we did endourological procedure .

At first we evaluated the lower coil of DJ , if encrustation was found then we fragmented it by mourmyer stone crusher for adults.

If encrustation around DJ in ureter, we introduced simirigid URS in between ureteral wall &DJ & fragmentation occur by laser or pneumatic lithotipsy with remove of small fragment by forceps. if there was obvious ureteric injury, we inserted DJ for 4 weeks durations,such conditionoccurred in two patient (7.14%).

If there was severe encrustation in kidney which occurred in 2 cases, we used open surgery because PNL not available in our hospital .

**Conclusion**

Forgotten/neglected DJ can lead to wide range of complications from simple lower urinary tract symptoms to the loss of renal function. The treatment of retained or neglected DJ (as in our study) is a challenging procedure &need individualization of cases. international algorithm might be needed to treated such difficult situation. Health education about serious complications that may occur due to longtime DJ insertion.

**Conflict of Interest**: Non

**Source of Findings:** Self Findings.

**Ethical Clearance:** Non

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# The Association of Raised Mid-trimester Serum Human Chorionic Gonadotrophin (hCG) and Alpha-Fetoprotein with adverse Pregnancy Outcome

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## Abstract

**Background:** Placenta is a temporary endocrine organ formed during pregnancy, which produces hormones important in the maintenance of a healthy pregnancy. hCG is the first one of these hormone that is measured in pregnancy test and used in the follow up of adverse pregnancy outcome, Alpha fetoprotein is a major plasma protein produced by the yolk sac and the fetal liver during fetal development.**Aim of study** :to study relationship between gestational complications and levels of maternal serum HCG and AFP and determine whether the semarkers are effective predictors adverse pregnancy outcomes. **Patients & Methods**:Prospective cohorts study in AlDiwaniyah maternity and pediatrics teaching hospital.We enrolled a total of 230 women at 14-23 gestational weeks and measurement of maternal serum HCG & AFP were done, of those with normal HCG & AFP formed (group l), group 2 involved women with elevated AFP , group 3 with elevated HCG & group 4 involved women with elevated both HCG & AFP.Follow up weekly of the patients for the development of adversepregnancy outcome.**Results**: A significant relationship between adverse pregnancy outcomes and abnormal elevation of HCG & AFP levels in the second trimester. In group 2 the patients developed higher rate of preterm labour & pre-eclampsia compared with the group 1. In group 3 with raised HCG the rate of pre-eclampsia & IUGR development were higher than group 1. In group 4 with elevated both HCG & AFP higher incidence of pre-eclampsia & placental abruption , with a specificity($p<0.001$). **Conclusion**: In the second trimester unexplained high AFP and HCG rates related to adverse maternal and perinatal outcomes.

***Keywords:*** *Mid-trimester; Serum Human Chorionic Gonadotrophin(hCG);Alpha-Fetoprotein; adversePregnancy Outcome*

## Introduction

Is a marker of glycoprotein hormone family ( human chorionic gonadotrophin , follicular stimulating hormone FSH , luteinizing hormone LH, thyroid stimulating

hormone TSH).All of them are dimers consisting of a common alpha subunit and distinct beta subunit that are associated non-covalently.The distinct beta subunits confer biological activity and display various degrees of homology. In adult human chorionic gonorionic gonadotrophin expression is often associated with pregnancy, however human chorionic gonadotrophin can be found in another conditions such as gestational trophoblastic disease and non-germinomatous germ cell tumors [(1)] .

Human chorionic gonadotrophin is produced almost exclusively by the syncytiotrophoblast of the placenta . However it is synthesized by the fetal kidney und fetal liver Most of the human chorionic gonadotrophin in circulation is metabolized by the liver. Also 20% of the circulating human chorionic gonadotrophinis excreted by thekidney[(2)].Human chorionicgonadotropin interacts with the LHCG receptor of the ovary and promotes the maintenance of corpus luteum during beginning of

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pregnancy. This allows the corpus luteum to secrete the hormone progesterone during the firsttrimester ,Because of its similarity to LH , hcG can be used clinicallyto induce ovulation in the ovaries as well as testosterone production in the testes. human chorionic gonadotropin also plays a role in the cellular differentiation. proliferation and may activate apoptosis [3] .

**Table (1): Human chorionic gonadotrophin levels in weeks from the last normal menstrual period[4]:**

| LMP in weeks | levels of hCG |
|---|---|
| 3 weeks LMP | 5-50 |
| 4 weeks LMP | 5-426 mIU/ml |
| 5 weeks LMP | 18-7,340 mIU/ml |
| 6 weeks LMP | 1,080- 56,500 mIU/ml |
| 9-12 weeks LMP | 25,700-288,000 mIU/ml |
| 13-16 weeks LMP | 13,300-254,000 mIU/ml |
| 17-24 weeks LMP | 4,060-165,400 mIU/ml |
| 25-40 weeks LMP | 3,640-117,000 mIU/ml |
| Women who are not pregnant | <5.0 mIU/ml |
| Women after menopause | 9.5 mIU/ml |

Maternal serum alpha-fetoprotein(AFP) is a glycoprotein of 591 aminoacids and it's a member of the albuminoid gene family [alpha- fetoprotein (AFP), albumin( ALB), alpha albumin (a-ALB), vitamin D binding protein (DBP)] . In adults AFP expression is often associated with atocellular cancer, non-germinomatous germ call tumors andgastrointestinal cancer , however AFP can be found in non-neoplastic conditions such as : hepatitis, cirrhosis and pregnancy [5].

Alpha-fetoprotein is normally produced in early pregnancy primarily by the fetal liver and yolk sac . It is also produced to a lesser extent by the fetal gastrointestinal tract as the yolk sac involutes at the 9th week of gestation, the fetal liver is the principal source of alpha-fetoprotein during development [6;7].

Measurement of alpha fetoprotein is generally used in two clinical contexts. First, its measured in the pregnant women through the analysis of maternal blood or amniotic fluid as a screening test for certain developmental abnormalities such as aneuploidy. Second ,serum level of AFP elevated in people with certain tumors , and so used as biomarker to follow these diseases [8].

**There is association between elevated of human chorionic gonadotropin , alpha fetoprotein and some obstetrical conditions , like:**Preeclampsia; Reduced fetal growth ;Preterm birth and Intrauterine death (still birth) .

**Aim of study:** To investigate the maternal serum determine whethote the relationship between gestational complications and high levels of serum human chorionic gonadotrophin and alpha- fetoprotein and to whether these markers are effective predictors to adverse pregnancyoutcomes.

## Patients and Methods

Between 25 Janwomen who att Maternity and Pedi weeks were enroll and consent fourteen 25 January 2017-15 December 2017, a total of 230 pregnantattended obstetrics and gynecology department, AL-Diwaniyah . Materially andPediatrics Teaching Hospital, with a gestational weeks between 14-23enrolled in this study. All cases were informed about the screening test ant forms were obtained. The study protocol was approved

by the localethical committee.

The inclusion criteria were stated as follows:

1. Single live pregnancy.

2. Gestational age between 14-23 weeks and dating was based according to thelast menstrual period or early sonogram.

3. Regular antenatal follow-up.

The exclusion criteria were:

1. Discordant gestational age according to first trimester

2. Multiple pregnancy

3. Lack of antenatal follow-up

4. Feto-placental or congenital anomaly

5. Diabetes mellitus

6. Molar pregnancy

7. History of chronic hypertension, chronic renal disease, autoimmune disorder,thrombophilia, cardiovascular diseases and liver diseases or malignancies.

8. History of preeclampsia, IUGR, preterm labour.

After taking detailed history, general and obstetrical examination were done. Routine investigations, liver function tests, renal function tests and determination of maternal serum HCG (mIU/ml) and AFP (ng/ml), the samples are collected from patients.

Each patents draw about 2 cc blood sample and put it in 360 Automatedthese patients were followimmunoassay Analyzer (TOSOH AIA) for 20 minute and record the results. Allmis Were followed up till puerperium and the fetal outcome was reported.

The study was started with 230 pregnant, and 17 patients were excluded from the study, as 14 patients were lost to follow up, one patient developed gestational labetes mellitus, one patient had a fetus with congenital abnormality as vmphalocele) and one patient had given birth to a baby with Down's syndrome.

## Statistical Analysis

Data analysis was carried out using SPSS (Statistical Program ofout using SPSS (Statistical Program of Social Sciences) ver. 32.0 SPSS. Continuous variables were expressedjous variables were expressed as mean and standard deviation, whereas percentages and frequencies werepercentages and frequencies were used for categorical variables. Groups were controlled in terms of conformity to normal distribution by graphical check and Shapiro Wilk test. Kruskall-Wallis variance analysis was performed for not normally distributing continuous variables and ANOVA was used for normally distributed continuous variables. Intergroup differences for categorical values were assessed with chi square test. Sensitivity, specificity, positive predictive value and negative predictive value were calculated together with risk estimation using Odds ratio. A p-value <0.05 was considered statistically significant.

## Findings

**Table (2): Demographic characteristics of the study groups.**

| Characteristic | Group 1<br>n = 172 | Group 2<br>n = 19 | Group 3<br>n =16 | Group 4<br>n = 6 | P |
|---|---|---|---|---|---|
| Age(years)<br>mean±SD | 27.80 ±6.09 | 26.16 ±7.17 | 25.69 ±3.74 | 31.50 ±6.98 | 0.154 |
| Gestational age<br>(weeks)<br>mean±SD | 19.05 ±2.88 | 17.11 ±3.36 | 19.38 ±2.33 | 20.17 ±3.06 | 0.027 |

**Table (3): Laboratory data of the study groups.**

| Characteristic | Group 1 n = 172 | Group 2 n = 19 | Group 3 n =16 | Group 4 n = 6 | P |
|---|---|---|---|---|---|
| AFP(ng⁄ml) | 28.82 ±11.92 | 91.53 ±15.72 | 47.50 ±18.38 | 100.83 ±9.17 | <0.001 |
| Beta-HCG(mIU⁄ml) | 25.60 ±11.54 | 44.84 ±15.36 | 83.75 ±8.42 | 82.50 ±6.12 | <0.001 |

**Table (4): Multiple of the median expressed as mean and standard deviation for AFP and β-HCG**

| Characteristic | Group 1 n = 172 | Group 2 n = 19 | Group 3 n = 16 | Group 4 n = 6 | P |
|---|---|---|---|---|---|
| AFP | 0.76 ±0.32 | 2.34 ±0.54 | 1.26 ±0.49 | 2.67 ±0.24 | <0.001 |
| BHCG | 0.77 ±0.35 | 1.30 ±0.49 | 2.51 ±0.25 | 2.48 ±0.18 | <0.001 |

Group1: Women with AFP MoM <2 and β-HCG MoM <2; Group2: Women with AFP MoM ≥2 and β-HCG MoM <2; Group3: Women with AFP MoM <2 and β-HCG MoM ≥2; Group3: Women with AFP MoM ≥2 and β-HCG MoM ≥2

**Table (5):Pregnancy –related complications of the study groups.**

| Complication | Group 1 n = 172 n (%) | Group 2 n = 19 n (%) | Group 3 n =16 n (%) | Group 4 n = 6 n (%) | Total |
|---|---|---|---|---|---|
| PET | 2 (1.2) | 3 (15.8) | 9 (56.3) | 4 (66.7) | 18 (8.5) |
| IUD | 2 (1.2) | 0 (0.0) | 2 (12.5) | 0 (0.0) | 4 (1.9) |
| IUGR | 1 (0.6) | 1 (5.3) | 3 (18.8) | 0 (0.0) | 5 (2.3) |
| PTL | 4 (2.3) | 8 (42.1) | 0 (0.0) | 0 (0.0) | 12 (5.6) |
| Abruption | 0 (0.0) | 1 (5.3) | 1 (6.3) | 2 (33.3) | 4 (1.9) |

**Table (6): The sensitivity , specificity and predictive rates of AFP and HCG levels for predicting pregnancy complications.**

| | - | + | Sensitivity | Specificity | PPV | NPV | OR | P |
|---|---|---|---|---|---|---|---|---|
| Group 1 | 9 | 163 | | | | | | |
| Group 2 | 13 | 6 | 61.9 | 96.4 | 68.4 | 94.8 | 39.24 | <0.001 |
| Group 3 | 15 | 1 | 62.5 | 99.4 | 93.8 | 94.8 | 271.67 | <0.001 |
| Group 4 | 6 | 0 | 40.0 | 100.0 | 100.0 | 94.8 | 223.74 | <0.001 |

## Discussion

The results of our research showed that in the second trimester unexplained high AFP and hCG rates have been found related to adverse pregnancy outcomes. Pregnancies in which both AFP and hCG rates increasing together are being more complicated with adverse pregnancy complications in a more serious manner than pregnancies in which rates increase one by one[9].

In a prospective study conducted by Genc Z., et al study (2005), showed that in the second trimester increased hCG rate was in relation with increased antenatal complications [10] .

In our study, the specificity of high( ≥ 2.0) MOM of AFP and HCG for the development of antepartum complications in group 4 was 100% and sensitivity was 40%, with positive predictive value of 100%. For group 3, the specificity of isolated high HCG MOM (≥≥2.0 ) for the development of antepartum complications was 99.4% with sensitivity of 62.5% with positive predictive value of 93.8% . While forgroup 2, the specificity of isolated high AFP MOM (≥≥2.0 ) in the development of antepartum complications 96.4%, sensitivity of 61.9% with positive predictive value of 68.4%. In the absence of fetal chromosomal or structural anomalies, mid trimester AFP levels (above 2.5) MOM were associated with a defect in placentation (placental abruption and abnormal placental adherence. They also associated with increased risk for pregnancy complications including fetal death [ OR 10.1 (95% CI: 7.5-13.5)], gestational hypertension [ OR 1.6 ( 95% CI:1.3-2.1)], preterm delivery [ OR 1.8 (95% CI 1.5-2.3)], preeclampsia [ OR 0.83( 95% CI: 0.44-1.56)] and IUGR[OR 2.37[11].

Hui D *et al .,* study (2012), showed that elevated mid trimester HCG levels have been associated with congenital abnormalities, placental dysfunction and adverse pregnancy outcome . However, In the absence of fetal chromosomal or structural anomalies, mid-trimester HCG (2.5 MOM) associated with an increased risk for pregnancy complications including: fetal loss [ OR 2.2(95% CI: 1.33.0)),gestational hypertension [OR 1.4 (95% CI: 1.1-1.8)],preeclampsia [OR 1.19(95% CI: 0.88-1.61)] , IUGR [OR 1.3(95% CI: 0.9-1.7)],preterm delivery [OR 1.7 (95% CI: 1.4-2.1)] [12]

Extremely high mid-trimester HCG ( > 10 MOM) imply a poor pregnancy outcome as shown by Lepage N, et al study (2003) [13].

In our research, the relationship with high AFP and/ or HCG levels and maternal complications have been found statistically significant (p= 0.001) & our sensitivity and positive predictive value were high.

## Conclusions

**A**s a result of our research, in the second trimester unexplained high nester unexplained high AFP and hCGrates have been found related to adverse maternal and perinatal outcomes. Pregnancies in which both AFP and hCG rates increasing together are being more complicated with adverse pregnancy outcome, and in a

more serious manner than pregnancies in which rates increased one by one.

**Conflict of Interest :** None

**Source of Funding :** Self

**Ethical Clearance :** From patients and my college .

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# Evaluation of the Immune Response in Scabies Patient (Ordinary and Prisoners) Treated with Permethrin 5%

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## Abstract

Scabies is a common parasitic infection, caused by sarco-sarcoptes, the infection occurs when the *Sarcoptes* penetrates the corneal layer of the skin, predominant pathological manifestations, through inflammatory and allergic reactions to mite products.This study is designed to obtain the Evaluation of the immune response in scabies patient (Ordinary and Prisoners) treated with Permethrin 5%.The study included (28)Ordinary Scabies patients, (32) prisonersas well as a (30)healthy person as a control group. Blood samples were collected from all studied groups Enzyme-linked immunosorbent assay (ELISA) was used to measure Interleukine-4,IL-9 and total IgE.Results of the study showed that serum,IL-4 showed a significant ($P \leq 0.0001$) increasing in prisoners compared to ordinary patients and control groups(248.8±19.3vs.79.2±10.7pg/ml),(248.8±19.3vs.73.9±5.5pg/ml)respectively,while IL-9 showed a significant ($P \leq 0.001$), increasing in control compared to Ordinary Scabies patients group and prisoners (506.9±48.7vs.337.8±18.2 pg/ml), (506.9±48.7 vs. 424.1±36.5 pg/ml) respectively in post- treatment, There was positive correlation between (IL-4 and IgE).Levels of two cytokines (IL-4, and IL-9) were assessed in sera of Ordinary ScabiesPatients and control group, IL-4 showed a significant ($P \leq 0.0001$) increasing in Ordinary Scabies comparedto control group (92.5±7.0 vs. 73.9 ± 5.5pg/ml), respectively. While IL-9with asignificant decreasinglevel inOrdinary Scabies patients compared to control group(97.8 ±18.8 vs. 506.9 ±48.7 pg/ml) in pre-treatment, level of IgE were recorded in pre- treatment in ordinary patients and prisoners (314.8±37.5 vs. 17.8±3.7 IU/ml), (372.7±37.5 vs. 17.8±3.7 IU/ml) respectively, were a significantly increasing ($P => 0.05$) as compared to healthy control. In post- treatment IgE levels show a significantly lowering ($P => 0.05$), in prisoners than Ordinary patients(14.5±1.7 vs. 33.3±2.4 IU/ml).

***Keywords:*** *Scabies,IL-4, IL-9, totalIgE.*

## Introduction

Scabies is one of the diseases that are considered an endemic and epidemic in Iraq, it's a common parasitic infestation of global proportion, the source of scabies, prisons, military, relatives and hospital admission and travel, it's also affects many wild animals, causing severe economic losses**(1).** Although *Sarcoptes scabiei* worldwide spreads easily through close physical contact, Scabies is an acute itching disorder caused by an immune response to skin allergies and inflammatory reaction, IL-4 and IL-13, supporting their contribution to allergic inflammation, cause to increase IgE production, the elevated level of IL-4 suggests a preferential activation of TH2 cells and regulates IgE production, In addition to persist symptoms after treatment, most male prisoners are specifically of the type of nodular scabies **(2).**Increased physiological stress can have profound effects on the immune system**(3).**The effects of Glucocorticoid are the suppression of immune response mediators **(4).**Glucocorticoid secretion is increasingly used as an endocrine indicator **(5)**. Nervous tension plays a key role in the mechanism of response by the release of glucocorticoid **(6).**This study was conducted

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to evaluate the immune response in IL-4, IL-9and total IgE, in Ordinary scabies patients and Prisoners treated with Permethrin 5%.

*Immune response against scabies disease:*

Scabies mites are believed to have developed the ability to modify different aspects of the host's immune responses **(7).**

Prevent early immune and anti-inflammatory reactions, this delay allows to secrete unknown antigens that stimulate the proliferation of Regulatory cells and their secretion of IL-10, which would inhibit the inflammatory and immune responses in humans to the mites before a strong immune response occurs, resulting in delayed onset of symptoms**(8).**

*Role of IL-4*

Interleukin-4 is a multifunctional cytokine that plays an important role in regulating immune responses**(9).** Its effects depend on correlation and signaling through a receptor complex consisting of the IL-4Rα series and the common gamma chain (γc), leading to a series of phosphorylation events with kinases associated with receptors. This shift leads to the recruitment of mediators for cell growth, apoptosis resistance, gene activation and differentiation**(10).**

*Role of IL-9*

Initially, T cells were the main source of IL-9 since their discovery in 1988 were linked to the Th2 phenotype due to the location of genes within the Th2 cell and their preferential secretion with other cytokines, NKT cells are produced IL-9 that have been processing for nasal lymphoma cell lines (11).IL-9 has multiple cellular sources that may affect its polymorphic functions (pleiotropic) cytokines were studied primarily in the context of immune pathogenic T-helper-2.

*IgE*

IgE is important in defending the host against a variety of parasites, along with mast cells, basal cells, eosinophil, is an essential component of allergic inflammation and parasites. In humans, previous studies have shown that scabies lead to increased antibody production of IgE but with very different results **(12).** In allergies, activation of mast cells mediated by IgE depends on the antigen dose and route of entry, in the early stage increase in *S. scabiei*numbers subsequent to primary infestation with elevation of IgE, and then gradual reduction as host immunity develops; **(13). (14); (15);(16).**

## Material and Methods

*Subjects:*

Blood samples were collected from two groups: First- inmates including: Juvenile Prison and Iraqi Reform Section, (32 prisoners) aged (15-63 years), Second group: Ordinary Scabies patients in Allergy and Consultative Asthma Center (28 person), the ages ranged from (8 - 67) years, with (30 health person) as control group.The disease was diagnosed by a dermatologist; prisoners are sampled with the consent of the prisoner through a signature and thumbprint without any pressure.All samples were collected at period from May to August 2019.

*Blood sample collection*

Under sterile conditions, 2 ml of peripheral blood was withdrawn from patients and distinctly healthy control, and three were separated in a gel tube for 30 to 60 minutes for automatic coagulation at room temperature before centrifugation at 3000 rpm for 10 minutes, The obtained serum was divided into 3 Eppendorf tubes, and stored in Frozen at -20 ° C for serological tests. Elisa technique was performed to estimated serum level of IL-4,IL-9 and total IgE of all studied groups.

*Clinical examination*

The clinical examination had been done by the dermatologists in hospital and the scabies diseases were diagnosed according to clinical features.

*Statistical Analysis*:

Results are expressed as mean ± standard errors (M±SE) which were analyzed by one-way analysis of variance (ANOVA) followed by Fisher's test for multiple comparisons, using Stat view version 5.0. Differences were considered significant when $p<0.05$. The other data expressed as percentage (%) which were analyzed by chi square test using excel program version 2010. Regression analysis was performed by analysis of covariance (ANOVA) also using Stat view version 5.0.

## Results

*Results of Immunological study*

Total serum level for IL- 4, IL-9 and total IgE were investigated in serum of (ordinary Scabies patient and Prisoners as well as healthy control) groups. Results of the current study showed that serum Levels of two cytokines (IL-4 IL-9). were assessed in sera of scabies patients and control, IL-4 showed a significant ($P \leq 0.0001$) increasing in prisoners compared to ordinary patients groups(248.8±19.3vs.79.2±10.7pg/ml),(248.8±19.3vs.73.9±5.5pg/ml) respectively, while IL-9 showed a significant ($P \leq 0.001$), increasing in control compared to Ordinary Scabies patients group and prisoners (506.9±48.7vs.337.8±18.2 pg/ml), (506.9±48.7 vs. 424.1±36.5 pg/ml) respectively in post-treatment, There was positive correlation between (IL-4 and IgE). Levels of three cytokines (IL-4 and IL-9) were assessed in sera of Ordinary Scabies Patients and control group, IL-4 showed a significant ($P \leq 0.0001$) increasing in Ordinary Scabies compared to control group (92.5±7.0 vs. 73.9 ± 5.5pg/ml). While IL-9 with a significant decreasing level in Ordinary Scabies patients compared to control group (97.8 ±18.8 vs. 506.9 ±48.7 pg/ml) in pre-treatment, as shown in Table (1).

**Table (1): Comparison of serum level of IL-4,and IL-9Ordinary Scabies patients and prisoners as well as control according to treatment.**

| Groups | IL-4 (pg/ml) | | | | IL-9 (pg/ml) | |
|---|---|---|---|---|---|---|
| | Mean±S.E. | | | | Mean±S.E. | |
| | Post-treated | Pre-treated | | | Post-treated | Pre-treated |
| Control | | 73.9±5.5 | | | | 506.9±48.7* |
| Ordinary | 79.2±10.7 | 92.5±7.0* | | | 337.8±18.2 | 97.8±18.8 |
| Prisoners | 248.8±19.3* | | | | 424.1±36.5* | |
| P. value | <0.0001 | 0.049 | | | 0.043 | 0.003 |

*** Different letters= Significant difference (P≤0.05) between mean.**

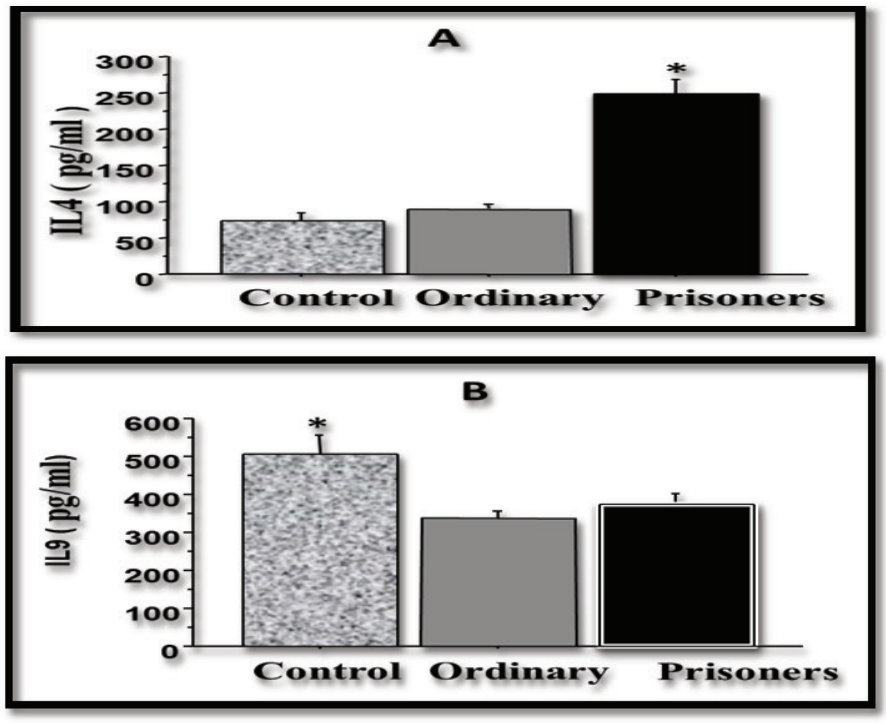


**Figure (1):Comparison of serum level of IL-4 and IL-9 in scabies patients and prisoners as well as control according to treatment.**

Level of IgE were recorded in pre-treated in ordinary patients and prisoners (314.8±37.5 vs. 17.8±3.7 IU/ml), (372.7±37.5vs.17.8±3.7 IU/ml), respectively were increased significantly ($P$ <0.05) as compared to healthy control. In post- treatment serum IgE levels show a significantly lowering($P$ <0.05), in Prisoners than ordinary patients (14.5±1.7 vs. 33.3±2.4 IU/ml) the total serum IgE in ordinary patients and prisoners as shown in table below (2).

**Table (2): Comparison of total IgE levels pre- and post-treatment in ordinary scabies patient and prisoners as well as healthy control groups.**

| Groups | IgE (IU/ml) pre-treatment | IgE (IU/ml) post-treatment | P.value |
|---|---|---|---|
| Control | 17.8±3.7 | | |
| Ordinary | 314.8±37.5 | 33.3±2.4* | <0.0001 |
| Prisoners | 372.7±37.5 | 14.5±1.7 | <0.0001 |
| P. value | | C. vs O. | <0.0001 |
| | C. vs P. <0.0001 | | |
| | P. vs O. NS | | |
| | P. vs O.=0.002 | | |

*ANOVA test was used to compare between ordinary patients groups with control group and prisoners group with control (H.S.: Highly significant).

* N.S: Non-Significant.

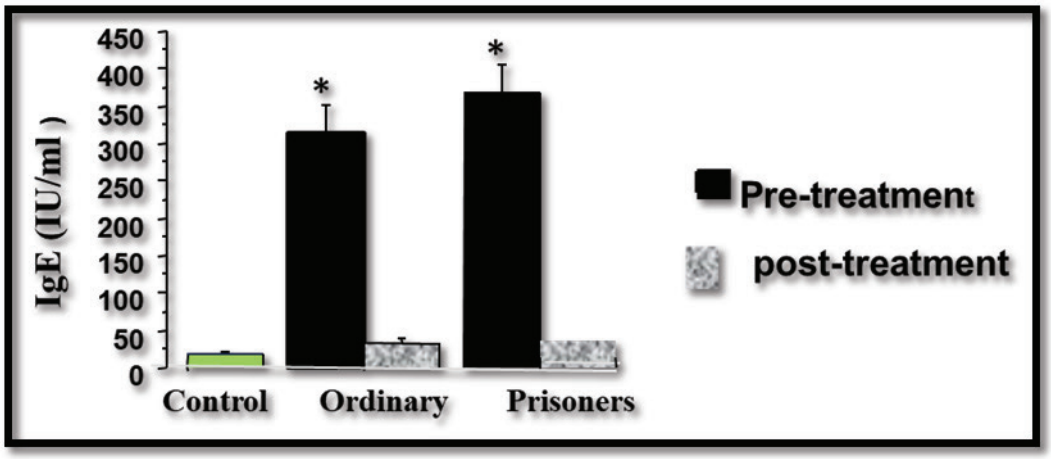


**Figure (2): Comparison of IgE level of ordinary scabies patients and prisoners as well as control according to treatment.**

*Correlation between IgE and cytokines*

Data from this study found that IgE positively correlation was observed between IL-4 and IgE, while IL-9 had a negative correlated with IgE, in the pre-treatment. A negative correlation between IL-4, IL9 and IgE in post-treatment, as shown in table (3).

**Table (3): Correlation coefficient between IgE and cytokines according to treatment.**

| **IgE** | **IL-4** | | **IL-9** |
|---|---|---|---|
| Post-treatment | R=0.16<br>P.value=0.254 | | R=0.14<br>P.value=0.189 |
| Pre-treatment | R=+0.44<br>P.value=<0.0001 | | R=0.73<br>P.value=0.85 |

-Correlation coefficient®

## Discussion

The scabies test depends on the duration of infestation at the time of the test and the length of treatment, Th2 cells are important for the production of major cytokines, including IL4 and IL5, these cytokines are important role for class switching antibody, regulating systemic IgE synthesis, IgE level in Ordinary scabies and prisoners was Significantly increasing compared to controls, in pre- treatment ($P$=>0.0001), in post-treatment IgE levels show a significantly lowering in Prisoners than Ordinary patients **(17),**IL-4 showed a significant ($P\leq$0. 0001) increasing in prisoners compared to ordinary patients and control groups, while IL-9 showed a significant ($P\leq$ 0.001), increasing in control compared to Ordinary Scabies patients group and prisoners, in post-treatment, There was positive correlation between (IL-4 and IgE). Levels of three cytokines (IL-4 and IL-9) were assessed in sera of Ordinary Patients and control group, IL-4 showed a significant ($P\leq$0. 0001) increasing in Ordinary Scabies compared to control group. While IL-9 with a significant decreasing level in Ordinary patients compared to control group in pre-treatment. Prison was the main source of scabies infestation (80%). this may be due to overcrowding, poor hygienic standards; sharing the beds and prolonged contact with contagious infested prisoners, similar results were observed in previous Iraqi studies **(18); (15)** which reported that prisoners were responsible for infesting 83.3% and 60% of the Ordinary scabietic patients.From these studies, there appear to be differences between immune responses to humans.These responses may also be affected by due to duration of infestation and type of infestation in humans and host gender.The current results in agreement with **(19),(20**). Demonstrated a statistically significant elevation of IL-4 in scabietic patients (Ordinary and prisoners) as compared in controls.In our study, the results were different for ordinary patients and prisoners because most prisoners were under treatmentthe theory may vary in prisons in terms of morbidity, personal and social behavior, treatment, the nature of nutrition and the closed and densely populated environment and contact with others, The category covered is prisoners may carry diseases that may lead to the development of immunity and events in complications of the disease with common diseases, including psoriasis and autoimmune… ect **(21);(22).**Most prisoners with permanent symptoms with re-infestation due to Failure to take appropriate administration to prevent the disease and use the treatment incorrectly, while others suffer from simultaneous conditions with scabies, such as chronic or acute infections, Some male prisoners specifically have a nodular scabies type, and this type may take another route in terms of treatment and persistent symptoms after treatment nodules can last for several weeks or months after treatment and may require corticosteroid injections**(2**). Topical treatments are effective, but the most effective ones, permethrin 5%, alternative therapies may be less effective, poorly tolerated, or have more significant adverse effects such as sulfur, benzyl benzoate;The data showed that interleukin-9 is not induced by scabies proteins.In allergies, activation of mast cells mediated by IgE depends on the antigen dose and route of entry, in the early stage increase in *S. scabiei* numbers subsequent to primary infestation with elevation of IgE, and then gradual reduction as host immunity develops; This findings agreed with other studied (**14); (15); (16**).In our study we observed there is one explanation in the action of permethrin to reduce inflammation and eliminate allergic reactions in the

immune aspect: The most common anti-scabies treatment (permethrin 5%) inhibits activity and production of T cells, which are predominant cells in the inflammatory process by blocking the signal pathway, preventing the release of histamine from mast cells and basal cells**(23).** Antihistamines block histamine signaling pathways and thus will prevent cell migration to inflamed tissues and thus reduce the production of inflammatory mediators and cytokines.

## Conclusion

Interleukin-9 has a non-specific effect on local allergies and is not induced by scabies proteins, while it has an effect on systemic allergies.

**Acknowledgment:** We are thankful to the all patients for providing all samples in this study. All samples were collected after taking security statements from the Minister of Justice, the Iraqi Juvenile Reform Administration and the Baghdad Health Department in Karkh, samples of prisoners are taken with the consent of the prisoner by pledge, signature and thumbprint without any pressure.

**Conflict of Interest :** None

**Source of Funding :** Self

**Ethical Clearance :** From patients and my college .

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# Association of birth Spacing with birth weight in Baghdad City

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## Abstract

**Background:** Birth spacing might influence infantile under nutrition through its association with preterm births and low birth weight. If a pregnancy occurs too soon after the previous birth, the mother may not have recovered her nutritional status, which can contribute to preterm birth and low birth weight. Birth spacing allows women to recover and be healthy for their next pregnancy.

**Objectives:** To determining the effect of birth spacing with birth weight, also to study the factors effecting birth spacing interval in a sample of women in Baghdad city.

**Materials and methods:** The study design was descriptive study (cross sectional). Which included 100 women collected from Mohammad-Baker-Al-Hakim Hospital in Shua'la city in Baghdad, during the period from 10th October 2017 till 10th March 2018 during data collection, the questionnaire from each woman was done.

**Results:** This study clarified that the highest percentage of women (46%) had a birth interval (>24) months and (26%) them had a birth interval of (8-12) month. while, lower percentage of women (12%) had a birth interval of (13-18) months. The highest percentage of birth babies of (3.2Kg) and more than (3.2Kg) (51.19%) had a birth interval of (>24) months, while, highest percentage of less than (3.2Kg), (50%) had birth intervals of (8-12) months.

**Conclusions:** The highest rate of women had a birth interval of (>24) months with birth interval of (8-12) months, had a birth interval of (13-18) months. Birth interval was longer in mother of breast feeding. The highest rate of birth space interval was among age group (26-30) years. The highest rate of birth weight babies had birth intervals of (>24) months with birth intervals of (8-12) months.

***Keywords****: Birth, Spacing, Birth Weight, Pregnant.*

## Introduction

Birth spacing had been made by the International Organizations based on the information that was available several years ago. While publications by the World Health organizations (WHO) [1] and other international organizations recommend waiting at least 2-3 years between pregnancies to reduce infant and child mortality, and also to benefit maternal health[2].

Several studies have reported greater risks of the adverse pregnancy outcomes low birth weight and small-for-gestational-age (SGA) after short pregnancy intervals [1]. Some investigators have attributed the higher risk of poor pregnancy outcomes to the associated factors rather than causally relations of short inter pregnancy intervals, such as maternal socio-demographic characteristics and lifestyle [3,4].

Foliate depletion, in particular, has been proposed as the nutritional factor that contributes most to the risk of fetal growth restriction [5]. As a consequence, their offspring may be at higher risk of intrauterine growth restriction and low birth weight [6,7]. Data on date of delivery, infant gender, birth weight, and gestational age (based on ultrasound or, if that measurement was not available <10% of cases, on the timing of the last menstrual period as recorded by the obstetric

care providers were obtained via the Youth Health Department at the Municipal Health Service [2,8].

Inter pregnancy interval was calculated as the number of months between the date of delivery and the date of the preceding birth, minus the duration of the pregnancy. The latter was defined by the gestational age at the time of delivery [9,10].

## Materials and Methods

A descriptive study (cross sectional) was done included 100 women collected from Mohammad-Baker-Al-Hakim Hospital in Shua'la city in Baghdad, during the period from 10th October 2017 till 10th March 2018. During data collection, the questionnaire from each woman was including the following:

A- Personal particulars: socioeconomic stratum (as described above), age, marital age, educational attainment and employment outside the home, if any.

B- Fertility experience: including gravidity, abortion, number of live births and deaths of children aged less than 5 years.

C- Family Planning: all respondent were asked about their knowledge of the socio-economic benefits of family planning, contraceptive method and the main source of such information. There were asked if they ever used contraception and which type. Women were also asked to indicate when they had started taking supplements- either before or after conception. Women who took folic acid supplements and had begun doing so before conception were classified as "early users" of folic acid; those who took folic acid supplements but had begun after conception were classified as "late users'' and those who did not use folic acid supplements at all were classified as "nonusers" [4]. A number of maternal physiologic, obstetric, lifestyle, and socio-demographic characteristics obtained via the questionnaire were considered as co variables. Physiologic and obstetric variables included age (<25, 25-34, or 35), parity (1, 2, or 3), height (in cm), pregnancy intention as measured by questioning whether the respondent had wanted to become pregnant (yes or no), and start of prenatal care (<18, 18-23, or 24 wk of gestation). Lifestyle variables included alcohol consumption before or during early pregnancy (self-reported previous week's behavior and behavioral change since pregnancy, recorded as no; yes, but not since pregnancy; or yes, also during pregnancy), smoking habits before and during early pregnancy (self-reported previous week's behavior and behavioral change since pregnancy, recorded as no; yes, but not since pregnancy; or yes, also during pregnancy), pregnancy body mass index (in kg/m2)based on self-reported height and weight, and psychosocial stress (presence of 0, 1, or 2) [3-6,10]. So this study was designed to determine the effect of birth spacing with birth weight also to study the relation between the factors affecting birth space interval in a sample of women.

**Statistical Analysis**: data were analysis through descript statistical measurement (frequency and percentage).

## Results

**Table (1) Relationship between birth interval and age group:**

| BSI* (months) | age group (years) | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | >20 | 21-25 | 26-30 | 31-35 | 36-40 | >40 | |
| 8-12 | 8<br>27.56 | 5<br>27.77 | 6<br>23 | 4<br>25 | 3<br>30 | 0<br>0 | 26<br>26% |
| 13-18 | 6<br>20.68 | 1<br>5.55 | 1<br>3.8 | 2<br>12.5 | 2<br>20 | 0<br>0 | 12<br>12% |
| 19-24 | 5<br>17.2 | 3<br>16.66 | 4 15.38 | 2<br>12.5 | 2<br>20 | 0<br>0 | 16<br>16% |
| >24 | 10<br>34.4 | 9<br>50 | 15 57.69 | 8<br>50 | 3<br>30 | 1<br>100% | 46<br>46% |
| Total | 29<br>100% | 18<br>100% | 26 100% | 16 100% | 10 100% | 1<br>100% | 100<br>100% |
| X=30.78 | | | df=10 | | p-value(p<0.01) | | |

BSI* = birth space interval; x =chi-square value; df =degree of freedom; p=probability level.

Table (1) shows that the highest percentage of women (46%) had a birth interval of (>24) months and (26%) than had a birth interval of (8-12) months. While, lower percentage of women (12%) had birth intervals of (13-18) months.

**Table (2) Relationship between birth interval and type of feeding:**

| BSI* (months) | Type of feeding | | | Total |
|---|---|---|---|---|
| | Breast | Bottle | Mixed | |
| 8-12 | 7<br>14.89% | 15<br>44.12% | 4<br>21% | 26<br>26% |
| 13-18 | 2<br>4.26% | 2<br>5.88% | 8<br>42% | 12<br>12% |
| 19-24 | 9<br>19.15% | 5<br>14.7% | 2<br>10.53% | 16<br>16% |
| >24 | 29<br>61.7% | 12<br>35.29% | 5<br>26.34% | 46<br>46% |
| Total | 47<br>100% | 34<br>100% | 19<br>100% | 100<br>100% |
| X=55.43 | | df=6 | p-value(p<0.01) | |

BSI* = birth space interval; x =chi-square value; df =degree of freedom; p=probability level.

Table (2) presents that (61.7%) of women who were breast feeding their babies had longest birth interval (>24) months. While (44.12%) of mothers who bottle fed their infants had low birth interval (8-12) months.

**Table (3) Relationship between birth interval educational levels:**

| BSI* (months) | Type of education | | | | Total |
|---|---|---|---|---|---|
| | Illiterate | Primary | Secondary | University | |
| 8-12 | 2<br>15.38% | 5 29.41% | 13<br>24% | 6<br>31.58% | 26<br>26% |
| 13-18 | 4<br>30.77% | 6 35.92% | 1<br>1.96% | 1<br>5.26% | 12<br>12% |
| 19-24 | 3<br>23.1% | 3 17.65% | 6<br>11.76% | 4<br>21.1% | 16<br>16% |
| >24 | 4<br>30.77% | 3 17.65% | 3<br>66.66% | 8<br>42.1% | 46<br>46% |
| Total | 13<br>100% | 17 100% | 51<br>100% | 19 100% | 100 100% |
| X=38.25 | | df=10 | p-value(p<0.01) | | |

BSI* = birth space interval; x =chi-square value; df =degree of freedom; p=probability level.

Table (3) referred that the highest percentage of women had a secondary education (66.66%) with birth interval of (19-24) months. While, (42.1%) of them had university with birth intervals of (>24) months.

**Table (4) Relationship between birth interval and occupation:**

| BSI* (months) | Work | | Total |
|---|---|---|---|
| | Working | Housewife | |
| 8-12 | 18<br>27.27% | 8<br>23.53% | 26 26% |
| 13-18 | 2<br>3% | 10<br>29.41% | 12 12% |
| 19-24 | 9<br>13.64% | 7<br>20.59% | 16 16% |
| >24 | 37<br>56% | 9<br>26.47% | 46 46% |
| Total | 66<br>100% | 34<br>100% | 100 100% |
| X=29.21 | df=3 | p-value(p<0.01) | |

BSI* = birth space interval; x =chi-square value; df =degree of freedom; p=probability level.

Table (4) shows that (56%) of women was the working women with low birth interval, while housewife (26.47%).

**Table (5) Relationship between birth interval and parity:**

| BSI* (months) | Live baby | | | Total |
|---|---|---|---|---|
| | 1-3 | 4-7 | 8-11 | |
| 8-12 | 7<br>20.59% | 13<br>26.53% | 6<br>35.29% | 26<br>26% |
| 13-18 | 2<br>5.88% | 1<br>2% | 9<br>52.94% | 12<br>12% |
| 19-24 | 13<br>38.24% | 2<br>4% | 1<br>5.88% | 16<br>16% |
| >24 | 12<br>35.29% | 33<br>67.34% | 1<br>5.88% | 46<br>46% |
| Total | 34<br>100% | 49<br>100% | 17<br>100% | 100<br>100% |
| X=13.88 | df=6 | p-value(p<0.01) | | |

BSI* = birth space interval; x =chi-square value; df =degree of freedom; p=probability level.

Table (5) presents that the highest percentage of women has (4-7 live babies) in (67.34%) birth interval of (>24) months in comparison with (4-7 live babies) in (4%) birth intervals of (13-18) months.

**Table (6) Relationship between birth interval (months) and contraceptive:**

| BSI* (months) | Contraceptive use | | Total |
|---|---|---|---|
| | Yes | No | |
| 8-12 | 6<br>12.77% | 20<br>37.73% | 26<br>26% |
| 13-18 | 4<br>8.51% | 8<br>15% | 12<br>12% |
| 19-24 | 7<br>14.89% | 9<br>16.98% | 16<br>16% |
| >24 | 30<br>63.83% | 16<br>30.19% | 46<br>46% |
| Total | 47<br>100% | 53<br>100% | 100<br>100% |
| X=66.77 df=3 p-value(p<0.01) | | | |

BSI* = birth space interval; x =chi-square value; df =degree of freedom; p=probability level.

Table (6) reflects the highest percentage of women (63.83%) who were not using contraceptives and had low birth interval (>24) months. As Compared with (37.73%) who using contraceptive had high birth interval (8-12) months.

**Table (7) Relationship between birth interval and abortion:**

| BSI* (months) | Abortion | | Total |
|---|---|---|---|
| | Yes | No | |
| 8-12 | 10<br>33.33% | 16<br>22.86% | 26 26% |
| 13-18 | 5<br>16.66% | 7<br>10% | 12 12% |
| 19-24 | 6<br>20% | 10<br>14.29% | 16 16% |
| >24 | 9<br>30% | 37<br>52.86% | 46 46% |
| Total | 30<br>100% | 70<br>100% | 100 100% |
| X=66.77 df=3 p-value(p<0.01) sig = Ns | | | |

BSI* = birth space interval; x =chi-square value; df =degree of freedom; p=probability level.

Table (7) shows that the highest percentage of women (52.86%) who not abortion had birth interval (>24) months. Compared with (33.33%) who abortion had birth interval (8-12) months.

**Table (8) Relationship between birth interval and birth weight:**

| BSI* (months) | birth weight babies | | Total |
|---|---|---|---|
| | Less than 3.2kg | 3.2kg and more than 3.2kg | |
| 8-12 | 8<br>50% | 18<br>21.43% | 26<br>26% |
| 13-18 | 2<br>12. 5% | 10<br>11.9% | 12<br>12% |
| 19-24 | 3<br>18.75% | 13<br>15.48% | 16<br>16% |
| >24 | 3<br>18.75% | 43<br>51.19% | 46<br>46% |
| Total | 16<br>100% | 84<br>100% | 100<br>100% |
| X=26.66 | df=3 | p-value(p<0.01) | |

BSI* = birth space interval; x =chi-square value; df =degree of freedom; p=probability level

Finally table (8) clarifies the highest percentage of birth weight babies 3.2 kg and more than 3.2 kg (51.19%) had a birth interval of (>24) months, while the highest percentage of birth weight babies less than 3.2 kg (50%) had a birth interval of (8-12) months.

## Discussion

A number of maternal physiologic, obstetric, lifestyle, and socio-demographic characteristics obtained via the questionnaire were considered as co-variables. Physiologic and obstetric variables included age (<25, 25-34, or 35y), parity (1, 2, or 3), height (in cm), pregnancy intention as measured by questioning whether the respondent wanted to become pregnant (yes or no), and starting of prenatal care (<18, 18-23, or 24 wk of gestation).

Life style variables including the national objections, family objections and personal objections decades both professional and public attitude towards fertility control have changed significant proportion of gynecological practice is now concerned with problems of contraception [6-8,12]. It specifically means the age of the mother at which pregnancy occurs. The most suitable age for reproduction is between 20 and 35 years.

Complications such as difficult labor, failure of lactation, congenital anomalies, prematurity, neonatal mortality and stillbirths will increase [6,13]. Too many births appear to decrease the efficiency of reproduction and lead to maternal depletion. Improving quality of health care is an increasingly important goal of international family planning programs, for a variety of reasons [3,14].

The current study results present that the birth interval was 24 months [8-12,15], which is an inadequate spacing for the health of both the mother and her infant. Similar other studies were proved in India, Yemen and Baghdad in 2005 [4,5,12,16]. Most of mothers birth intervals who were breast feeding their infants than

those who used bottle feeding.

Regarding education, most of women were having secondary education (66.66%) with birth interval of (19-24) months while (42.1%) of them had finished university with birth interval of (>24) months. Higher education level usually reflects longer birth intervals [10,15,17].

Most women here were employed (56%) with low birth intervals. While the un employed women were (26.47%) and these findings were in agreement with a study done in Baghdad during 2005. Prolonged contraception with birth space interval for women in comparison to those ones who did not use any contraceptive the quality of family planning services is an important determinant of contraceptive usage, because it is likely to affect contraceptive on mother and children health [18-20]. Abortion was a factor that affect birth interval in women (52.86%) who were not aborted having birth interval (>24) as compared with (33.33) who had abortion with birth interval (8-12). The highest rate of babies birth weight was (3.2 kg or more than weight 3.2 kg) in (51.19%) associated with birth intervals of (>24) months. And the highest rate of baby's birth weight less than 3.2kg in (50%) of them having birth intervals of (8-12) months.

## Conclusion

In Conclusion, the highest rate of women have a birth interval of (>24) months and them had a birth interval of (8-12) months, had a birth interval of (13-18) months. Birth interval was longer in mother of breast feeding their babies had a birth interval of (>24) months and of mothers who bottle fed had low birth interval of (8-12) months. The highest rate of birth space interval was among age group (26-30) years. The highest rate of birth weight babies had a birth intervals of (>24) months and they had birth intervals of (8-12) months.

**Conflict of Interest :** None

**Source of Funding :** Self

**Ethical Clearance :** From patients and my college .

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# Knowledge of Mothers Regarding Measles Control in Primary Health Care Centers in Al- Samawa City

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## Abstract

**Background:**Measles is a very communicable viral illness that can be prevented by immunization. knowledge is key tools to control of disease.

**Objectives:**The aims of study were identify mothers knowledge regarding measles control and immunization.

**Methods:**A cross sectional study (descriptive study ) was conducted in Al-Samawa city/Iraq during the period between 2/3/ 2019 to1/7/ 2019. Data collected from (450) mothers who have at least one child less than(5)years of age,though using a special questionnaire format.

**Results:** The study finding out about (72.9%) of mothers participant were acceptable knowledge of measles control and(24.4%) were poor knowledge while the(2.4%) have agood knowledge.

**Conclusion:**The study concluded most of mothers had been acceptable levels for knowledge. However, educational program is still needed to increase the parents' knowledge especially among illiterate and less educated parents.

***Keywords:****Knowledge, Immunization, Vaccination.*

## Introduction

Measles is a very communicable viral illness that can be prevented by immunization[1].Most cases of measles occur during the dry season and in areas with temperate climates,the peak occurs during late winter and early spring[2]. Measles is decreased because of immunization but many areas of the world continue to experience outbreaks[1].It is spread by coughing and sneezing,close personal contact[3].Measles characterized by fever,cough,coryza,and conjunctivitis, followed by a maculopapular rash, during the prodromal period, aKoplik spots may be present[1].Vaccination is one of the most cost-effective interventions to prevent major illnesses that contribute to child mortality[1]. Measles vaccines are safe, effective and providing a crucial tool for global measles elimination[2].To prevent recurrent outbreaks of measles, 95 percent of the population must be immune[3]).Several attenuated measles vaccines are available worldwide, either as single-virus vaccines or in combination with other vaccine viruses (commonly rubella and mumps)[2].Elimination of an infectious disease is mean the total absence of cases in a population.This situation can occur only if the entire population is immune as a result of either natural disease or vaccination[3]. Determine knowledge of mothers regarding measles which helpful to control,The aims of study were to determine mothers knowledge regarding measles control and identify mothers information source regarding measles control**.**

## Material & Subject

### Study design

A cross sectional study was carried out in Al-Samawa city for the period between 2/3/2019 to1/7/2019. The study included(450)mothers at reproductive age, whose had at last one child or more under five years of ages, attended to primary health care center. This study included an interview with the mothers and using aspecial questionnaire format. The questionnaire contained 3

different parts. The first part included questions about the demographic characteristic and other 2 parts included questions about the knowledge and information source of mother toward measles control and vaccination .

## Statistical Analysis

Analysis of data was carried out using the Statistical Packages for Social Sciences(SPSS-25) Data were presented in simple measures of frequency, percentage, mean, standard deviation, and range (minimum-maximum values).

The significance of difference for different percentages(qualitative data)were tested using Pearson Chi-square test($\chi^2$-test)with application of Yate's correction or Fisher Exact test whenever applicable. Statistical significance was considered whenever the P value was equal or less than 0.05.

## Results

**Table1:Distribution mothers participant according to the Socio-demographic characteristic.**

| **I=Sociodemographic characteristic** | | **No** | **%** |
|---|---|---|---|
| Residence | Rural | 209 | 46.4 |
| | Urban | 241 | 53.6 |
| Age of mother(years) | <20y | 13 | 2.9 |
| | 20---24 | 69 | 15.3 |
| | 25---29 | 99 | 22.0 |
| | 30---34 | 99 | 22.0 |
| | 35---39 | 121 | 26.9 |
| | =>40y | 49 | 10.9 |
| | Mean±SD (Range) | 31.4±6.5 (17-44) | |
| Marital status | Married | 395 | 87.8 |
| | Separated | 33 | 7.3 |
| | Widow | 22 | 4.9 |
| Mother's educational | Illiterate | 34 | 7.6 |
| | Read & Write | 86 | 19.1 |
| | Primary | 106 | 23.6 |
| | Intermediate | 39 | 8.7 |
| | Secondary | 67 | 14.9 |
| | Institute | 70 | 15.6 |
| | College & higher | 48 | 10.7 |

***Cont...*** **Table1: Distribution mothers participant according to the Socio-demographic characteristic.**

| | | | |
|---|---|---|---|
| Mother's occupation | Governmental employee | 110 | 24.4 |
| | Self-employee | 3 | .7 |
| | Retired | - | - |
| | Student | 8 | 1.8 |
| | Housewife | 329 | 73.1 |
| Number of child | 1 | 21 | 4.7 |
| | 2 | 55 | 12.2 |
| | 3 | 142 | 31.6 |
| | 4 | 136 | 30.2 |
| | =>5 | 96 | 21.4 |
| Number of rooms | 1 | 7 | 1.6 |
| | 2 | 355 | 78.9 |
| | 3 | 82 | 18.2 |
| | =>4 | 6 | 1.4 |
| Family members | 1 | 2 | .4 |
| | 3 | 10 | 2.2 |
| | 4 | 42 | 9.3 |
| | 5 | 124 | 27.6 |
| | 6 | 107 | 23.8 |
| | 7 | 53 | 11.8 |
| | 8 | 48 | 10.7 |
| | 9 | 24 | 5.3 |
| | =>10 | 40 | 8.7 |
| Crowding Index | =<1.0CI | 37 | 8.2 |
| | 2.0--- | 177 | 39.3 |
| | 3.0--- | 145 | 32.2 |
| | 4.0--- | 66 | 14.7 |
| | =>5.0CI | 25 | 5.6 |
| Type of house | Owned | 216 | 48.0 |
| | Rented | 130 | 28.9 |
| | Shared | 104 | 23.1 |

Table(1)shows that(53.6%)from mothers participant were living in urban area with mother's age group the highest percentage were from(35-39)years were accounted(26.9%)and(87.8%)were married. Regarding to the education level of mothers participant were primary school graduate accounted(23.6%).About the mother's occupation majority of mothers participant were housewife(73.1%), while the number of child, major part of mother's participant have three children were accounted(31.6%).

Lastly, crowding index refer to 2nd class(2up to4) personal sharing in the room ,they accounted(86.2%).

**Table(2):Distribution the mothers participant according the knowledge item.**

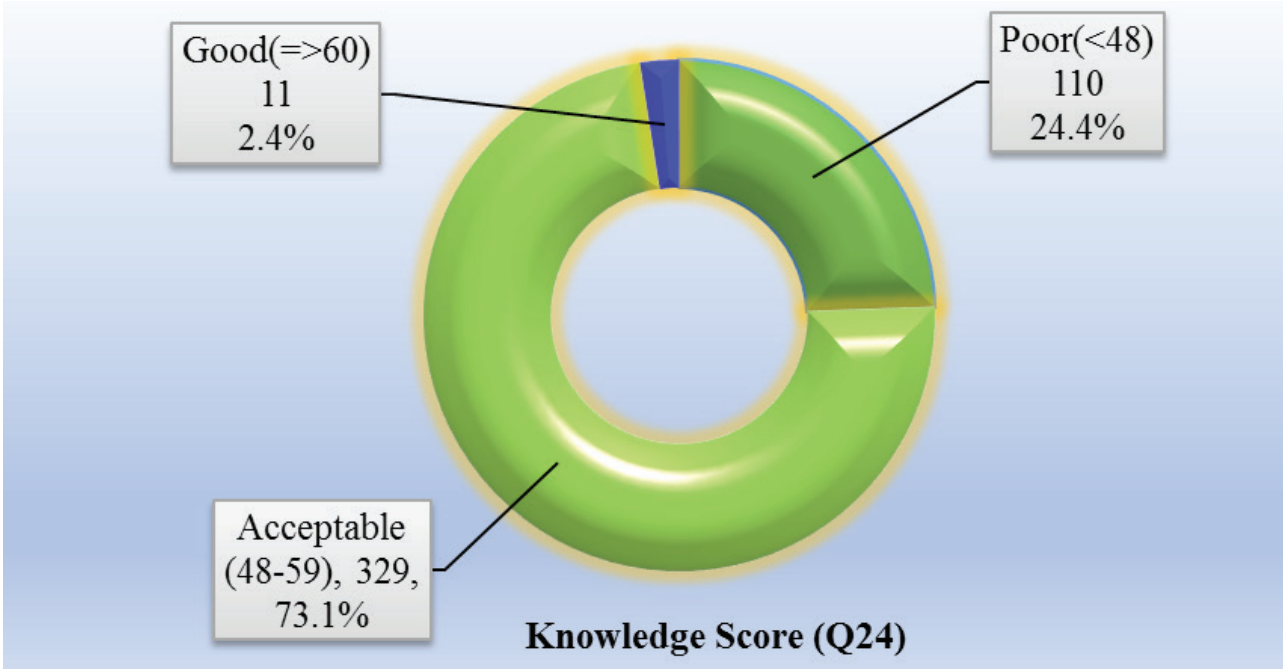
| **II=Mother's Knowledge** | | **Yes** | | **No** | | **DNK** | |
|---|---|---|---|---|---|---|---|
| | | **No** | **%** | **No** | **%** | **No** | **%** |
| Know about measles | | 443 | 98.4 | - | - | 7 | 1.6 |
| Measles causes by; | Virus | 188 | 41.8 | | | | |
| | Bacteria | 154 | 34.2 | | | | |
| | Parasite | 85 | 18.9 | | | | |
| | DNK | 23 | 5.1 | | | | |
| Mode of transmission of measles by; -Droplet and airborne | | 215 | 47.8 | 192 | 42.7 | 43 | 9.6 |
| -Feco-oral | | 292 | 64.9 | 123 | 27.3 | 35 | 7.8 |
| -Direct contact | | 176 | 39.1 | 247 | 54.9 | 27 | 6.0 |
| -Clothes and fomites | | 114 | 25.3 | 310 | 68.9 | 26 | 5.8 |
| Singe and symptom of measles; -High fever | | 326 | 72.4 | 87 | 19.3 | 37 | 8.2 |
| -Cough | | 87 | 19.3 | 303 | 67.3 | 60 | 13.3 |
| -Runny nose(coryza) | | 13 | 2.9 | 394 | 87.6 | 43 | 9.6 |
| -Conjunctivitis | | 5 | 1.1 | 395 | 87.8 | 50 | 11.1 |
| -Rash | | 356 | 79.1 | 65 | 14.4 | 29 | 6.4 |
| There is avaccine available to prevent measles | | 438 | 97.3 | 2 | .4 | 10 | 2.2 |
| The name of vaccine is; -Tetanus Toxoid Vaccine | | 41 | 9.1 | 388 | 86.2 | 21 | 4.7 |
| -Measles Vaccine | | 421 | 93.6 | 15 | 3.3 | 14 | 3.1 |
| -DPT Vaccine | | 194 | 43.1 | 224 | 49.8 | 32 | 7.1 |
| -MMR Vaccine | | 307 | 68.2 | 104 | 23.1 | 39 | 8.7 |
| -OPV Vaccine | | 3 | 7 | 426 | 94.7 | 21 | 4.7 |
| -BCG Vaccine | | 20 | 4.4 | 410 | 91.1 | 20 | 4.4 |
| -Tetra Vaccine | | 135 | 30.0 | 297 | 66.0 | 18 | 4.0 |
| -Penta Vaccine | | 100 | 22.2 | 324 | 72.0 | 26 | 5.8 |

***Cont...*** **Table(2):Distribution the mothers participant according the knowledge item.**

| | | | | | | |
|---|---|---|---|---|---|---|
| The age measles vaccine should be given to baby;-At birth | 15 | 3.3 | 410 | 91.1 | 25 | 5.6 |
| -2months | 19 | 4.2 | 414 | 92.0 | 17 | 3.8 |
| -4months | 56 | 12.4 | 365 | 81.1 | 29 | 6.4 |
| -6months | 158 | 35.1 | 235 | 52.2 | 57 | 12.7 |
| -9months | 277 | 61.6 | 154 | 34.2 | 19 | 4.2 |
| -15months | 110 | 24.4 | 313 | 69.6 | 27 | 6.0 |
| -18months | 51 | 11.3 | 362 | 80.4 | 37 | 8.2 |
| -Preschool(4-6 years) | 118 | 26.2 | 320 | 71.1 | 12 | 2.7 |
| The age MMRvaccine should be given to baby;-At birth | 51 | 11.3 | 362 | 80.4 | 37 | 8.2 |
| -2months | 48 | 10.7 | 363 | 80.7 | 39 | 8.7 |
| -4months | 36 | 8.0 | 386 | 85.8 | 28 | 6.2 |
| -6months | 62 | 13.8 | 359 | 79.8 | 29 | 6.4 |
| -9months | 94 | 20.8 | 315 | 70.0 | 41 | 9.1 |
| -15months | 274 | 60.9 | 162 | 36.0 | 14 | 3.1 |
| -18months | 96 | 21.3 | 318 | 70.7 | 36 | 8.0 |
| -Preschool(4-6 years) | 197 | 43.8 | 227 | 50.4 | 26 | 5.8 |
| Frequent campaigns are useful for child | 419 | 93.1 | 31 | 6.9 | - | - |
| Frequent campaigns replace the routine vaccination in PHCC | 200 | 44.4 | 217 | 48.2 | 33 | 7.3 |
| Know measles control and elimination is important | 431 | 95.8 | - | - | 19 | 4.2 |
| Have the desire to know about measles and MMR vaccination | 308 | 68.4 | 113 | 25.1 | 29 | 6.4 |
| Heard about any side effect measles and MMR vaccination | 394 | 87.6 | 56 | 12.4 | - | - |
| Immunize the child;The side effect observed was;-Fever | 236 | 52.4 | 214 | 47.6 | - | - |
| -Pain and swelling in site of injection | 230 | 51.1 | 220 | 48.9 | - | - |
| -Rash | 79 | 17.6 | 371 | 82.4 | - | - |
| -Headache | 44 | 9.8 | 406 | 90.2 | - | - |

Table (2) shows the (42% ) of mothers participant answered correctly for measles causes by virus, while (47.8%),(39.1%),(25.3%) know correctly the measles transmission by droplet and airborne, direct contact and clothes and fomites respectively, high percentage (72.4% ,79.1%)from mothers participant know the measles accompanied by fever and rash. The majority (97.3%)from their know correctly the vaccine available. About(93.6%),(68.2%) of mothers answered correctly about vaccine name to prevent measles while that (61.6% ),( 60.9%),(43.8%) respectively from mothers know correctly the child age should be given the vaccine. High percentage(52.4% ,51.1%) of mothers observed side effect as fever, pain and swelling in site of injection when immunize their child.

Overall score for knowledge in figure (1)in which majority (72.9%) of mothers participant were acceptable knowledge of measles control and (24.4%) were poor knowledge while the (2.4%) have agood knowledge.




**Figure(1)score for knowledge**

**Table(3):Distribution the mothers participant according to information source**.

| information source | No | % |
|---|---|---|
| -Health workers | 416 | 92.4 |
| -TV&radio | 213 | 47.3 |
| -Social media(internet/Facebook) | 182 | 40.4 |
| -Neighbors | 83 | 18.4 |
| -Relatives & friends | 51 | 11.3 |

Table(3)shows that health workers registered high percentage among studied mothers, were accounted(92.4%).

**Table(4): Association between socio-demographic characteristic of mothers participant and Knowledge score.**

| I=Sociodemographic characteristic | | Knowledge Score(Q24) | | | | |
|---|---|---|---|---|---|---|
| | | Poor(<48) | | Acceptable/Good(=>48) | | P value |
| | | No | % | No | % | |
| Residence | Rural | 57 | 51.8 | 152 | 44.7 | 0.194 |
| | Urban | 53 | 48.2 | 188 | 55.3 | |
| Age of mother (years) | <20y | 4 | 3.6 | 9 | 2.6 | 0.753 |
| | 20---24 | 15 | 13.6 | 54 | 15.9 | |
| | 25---29 | 20 | 18.2 | 79 | 23.2 | |
| | 30---34 | 25 | 22.7 | 74 | 21.8 | |
| | 35---39 | 31 | 28.2 | 90 | 26.5 | |
| | =>40y | 15 | 13.6 | 34 | 10.0 | |
| Marital status | Married | 98 | 89.1 | 297 | 87.4 | 0.882 |
| | Separated | 7 | 6.4 | 26 | 7.6 | |
| | Widow | 5 | 4.5 | 17 | 5.0 | |
| Mother's educational | Illiterate | 11 | 10.0 | 21 | 6.2 | 0.0001* |
| | Read & Write | 43 | 39.1 | 43 | 12.6 | |
| | Primary | 37 | 33.6 | 69 | 20.3 | |
| | Intermediate | 16 | 14.5 | 25 | 7.1 | |
| | Secondary | 3 | 2.7 | 64 | 18.8 | |
| | Institute | - | - | 70 | 20.6 | |
| | College & higher | - | - | 48 | 14.1 | |
| Mother's occupation | Governmental employee | - | - | 110 | 32.4 | 0.0001* |
| | Self-employee | - | - | 3 | 0.9 | |
| | Student | - | - | 8 | 2.4 | |
| | Housewife | 110 | 100.0 | 219 | 64.4 | |

***Cont...*** **Table(4):Association between socio-demographic characteristic of mothers participant and Knowledge score.**

| | | | | | | |
|---|---|---|---|---|---|---|
| Number of child | 1 | 4 | 3.6 | 17 | 5.0 | 0.478 |
| | 2 | 9 | 8.2 | 46 | 13.5 | |
| | 3 | 36 | 32.7 | 106 | 31.2 | |
| | 4 | 33 | 30.0 | 103 | 30.3 | |
| | =>5 | 28 | 25.5 | 68 | 20.0 | |
| Crowding Index | =<1.0CI | 1 | 0.9 | 36 | 10.6 | 0.0001* |
| | 2.0--- | 36 | 32.7 | 141 | 41.5 | |
| | 3.0--- | 36 | 32.7 | 109 | 32.1 | |
| | 4.0--- | 23 | 20.9 | 43 | 12.6 | |
| | =>5.0CI | 14 | 12.7 | 11 | 3.2 | |
| Type of house | Owned | 46 | 41.8 | 170 | 50.0 | 0.024* |
| | Rented | 43 | 39.1 | 87 | 25.6 | |
| | Shared | 21 | 19.1 | 83 | 24.4 | |
| *Significant difference between proportions using Pearson Chi-square test at 0.05 level | | | | | | |

Table(4)show significant association at P<0.05 among total Knowledge and difference levels of demographic variable (level of educational, mother's occupation, crowding Index and type of house).

**Table(5):Association between information source and knowledge score.**

| **Source of information** | | **Knowledge Score (Q24)** | | | | |
|---|---|---|---|---|---|---|
| | | **Poor (<48)** | | **Acceptable/Good (=>48)** | | **P value** |
| | | **No** | **%** | **No** | **%** | |
| -TV&radio | Yes | 35 | 31.8 | 178 | 52.4 | 0.001* |
| | No | 75 | 68.2 | 162 | 47.6 | |
| -Social media (internet/Facebook) | Yes | 12 | 10.9 | 170 | 50.0 | 0.001* |
| | No | 98 | 89.1 | 170 | 50.0 | |
| -Relatives &friends | Yes | 4 | 3.6 | 47 | 13.8 | 0.775 |
| | No | 106 | 96.4 | 293 | 86.2 | |
| -Neighbors | Yes | 8 | 7.3 | 75 | 22.1 | 0.001* |
| | No | 102 | 92.7 | 265 | 77.9 | |
| -Health workers | Yes | 101 | 91.8 | 315 | 92.6 | 0.0001* |
| | No | 9 | 8.2 | 25 | 7.4 | |
| *Significant difference between proportions using Pearson Chi-square test at 0.05 level | | | | | | |

Table(5)shows predominant information source of knowledge was health worker about (92.6%) and statistically high significant association at P<(0.01).

## Discussion

The results of the study offer insight to the knowledge of mothers regarding measles control in Al-Samawa city,and can be utilize to conduct of population.

Table(1)show the majority percentage(53.6%) were from urban area, this result was similar to study result done in Iraq[4]. Regarding to age group of mother participant the study result revealed that most of mother's age group were(35-39)years, with Mean±SD of their age(31.4±6.5), our result found (87.8%)were married, this result was agree with study result done in Iraq[5] and in Jordan[6]. Present study showed a high percentage was primary school level(23.6%)this result was accordance with study result done in India[7]and discordance with other study result done in Jordan[6]who found (44.5%) were university and higher level .This difference attributed to variation in socio-economical status between the communities.

Regarding to occupation aspect, in our study the majorty of mothers were house wife, they were accounted(73.1%), this may be due to the most mothers were unable to work because low education level, family responsibility, aging and lost opportunity to find work. This result was similar to the study result done in Iraq [4] and in(KSA)[8].

About the crowding index refer to2nd class(2up to4) personal sharing in the room, they accounted(86.2%). A strong relationship between crowding index of family and measles vaccination coverage rate, this may be attributed to higher education level of families with high economic status, lead to good awareness about of important the measles vaccination.

Table**(2)**reveal that(98.4% )of their know about measles**,** this result was similar to the result study done in China[9]. Regarding to item of is measles / viral, our study show accounted(41.8%)of mothers participant know measles is viral disease, this finding disagree with study conducted in Switzerland[10],who reproted that mothers partcipant were(85.8%)know measles is viral disease this difference may due to differ in level of health eduaction and culture status bettween the commuites. According to item "mode of transmission"by; droplet and airborne, direct contact and clothes and fomites the correctly answered were (47.8%),(39.1%),(25.3%) respectively, our result agree with result study conducted in India[11]. About the "singe and symptom" high percentage( 79.1%,72.4%) from mothers participant know the measles accompanied by rash and fever, this finding were accordance to report of study in India[11]. According to item "there is a vaccine available to prevent measles"the majority of mothers participant were accounted(97.3%)know correctly,this result similar to other study done in KAS[8]. About(93.6%) of mothers participant answered correctly for vaccine name, this a high knowledge percentages for vaccine name may be due to the fact that the vaccines are named by the diseases they prevent. This result agree with study results done in Nigeria[12]

The study finding regarding to child age should be given the vaccine (measles , MMR) around (61.6%),(60.9%),(43.8%)respectively from mothers participant answered correctly, this finding accordance with study done in China[9]. About subject "frequent campaigns are useful for child"(93.1%)of mothers sample answer"Yes", our result similarity to study reported in Iraq[13] The current study showed large number(95.8%)of mothers participant know measles control and elimination is important, this result similar to study result done in Iraq[4]. Our study found the percentage(52.4%, 51.1%)of mothers participant observed side effect as fever, pain and swelling in site of injection respectively when immunize their child, this finding accordance with study result done in Iraq[4].

Table**(3)**shows,each mothers participant might have one or more from different information source about measles and vaccination. Our study reported(92.4%)of their consider the health workers as information source. Our finding accordance with study result done in Iraq[5]. Our study found that(47.3%)of their who reported TVas information source, this result compatible with study result done in Egypt[16]**.**

As for items" social media(internet/ facebook),relatives & friends and neighbors"were accounted(40.4%),(11.3%),(18.4%)respectively, our finding similar with finding in Iraq[4] [13]

Table(4)demonstration there was no significant association between knowledge and (residence, age of mother and marital status) of mothers participant, while relationship between knowledge and mother's educational level and mother's occupation was statistically significant at( P< 0.01), this results matched with study result done in Egypt[14]

Another finding in study was asignificant relationship at( P< 0.01) between knowledge and crowding index and type of house, this result agree with other study result done in Iraq[15]

Table(5)shows the association between health worker as (information source) of mothers participant and knowledge was ahigher significant at p<(0.001). Similarly to studies reported in Iraq[6].While about the items"TV&radio, social media(internet/facebook) and neighbors" as information source was significant association with knowledge of mothers participant at P<(0.05). Our finding agree with study done in (KSA)[9].

## Conclusion

Most of mothers had been acceptable level for knowledge and receive information from health worker.

**Conflict of Interest :** none

**Source of Funding :** self

**Ethical Clearance :** From patients and my college .

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# Correlation of Ki 67, Histopathological Features and Shape of Lesion in Skeletally Mature Osteochondroma

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## Abstract

**Background**: Osteochondroma represents the most common benign tumor of bones and accounts for about 30-50 % of them. poor information's in previous studies act on demonstration of the significance of atypical histological changes as a premalignant precursor in mature osteochondroma regardless of the cap thickness. In this study, the proliferative activity of cartilaginous cap will be studied in skeletally mature patients regardless of the cap thickness to demonstrate the independent significant of histological features in predicting the malignant potential in osteochondroma. **methodology :** cases of skeletally mature osteochondroma (78 case) were isolated and separated into sessile and pedunculated, then into G1(without suspicious histological features) and G2 ( with suspicious features), and stained with Ki- 67 . Data were analyzed using SPSS version 21and p value < 0.05 was considered as significant. **Results**: There was significant association between study groups and Ki 67 staining results, majority (75%) of patients with suspicious histopathological features presented with positive results of Ki 67 staining ( p value < 0.001). while there was no correlation between shape of lesion and histopathological features ( p value 0.662). **Conclusion:** atypical histopathological features can be regarded as independent factor with the other clinical data when considering the diagnosis of grade 1 chondrosarcoma.

***Key words:*** *osteochondroma, proliferative marker, atypical histopathology, lesion shape, Ki 67 .*

## Introduction

Osteochondroma represents the most common benign tumor of the bony skeleton and accounts for about 30-50 % of them.[(1-2)] some researchers regards this tumor as developmental abnormality rather than a true neoplasm. It may result from small fracture in the growth plate in skeletally immature bone and herniated through periosteal bone to form a tumor like lesion.[(3-4)] pathologically, osteochondroma ( also called exostosis) is composed of cartilaginous cap of hyaline type , covered with fibrous sheath that is continuous with the periosteum and it in turn covering an underlying bone and medullary cavity that is continuous with that of the parent bone.[(5-6)] this continuity with the underlying bone is important radiological feature in the diagnosis and it is more clear in pedunuculated shape lesion than in sessile one. Development of osteochondroma in children whom treated with radiation for Wilm's tumor due to separation and migration of physeal plate support the suggestion that osteochondroma is a tumor like condition [(7-8-9)], on the other hand , presence of hereditary form of osteochondroma ( hereditary multiple osteochondromatosis or called hereditary multiple exostosis HME) support the fact that osteochondroma is a true neoplasm.[(10-11)] HME comprise about 15 % of osteochondroma and caused by mutation in EXT1 or EXT2 genes that are located on chromosome 8 and 11 respectively.[(12)] the most common location for osteochondroma is the metaphysis of long bones especially the lower limbs, flat bones are less commonly affected.[(13)] this benign tumor usually affect children and adolescent and stop growing after skeletal maturity. Clinically , it may be silent or cause disfigurement, pain due to pressure on a nerve or blood vessel and fracture.[(14)] the serious complication of this neoplasm is

malignant transformation, usually in form of secondary peripheral chondrosarcoma. Malignancy can complicate about 25% of HME and only 1-8 % of solitary exostosis [15-16]. At microscopy, the tumor composed of hyaline cartilage with lobulation , the chondrocytes are bland looking, evenly spaced and show ordered maturation in columns. The cartilage merges with the underlying bone that project from the bone of origin and continuous with it. Atypical histological features such as mild increased cellularity, occasional binucleation, more than one cell in the lacuna, and foci of necrosis are considered to be reactive changes in the growing cartilaginous cap and should not be overdiagnosed when the cap thickness is within usual.[3-17] the allowed cap thickness is up to 3 cm in children with immature skeleton and only few millimeters in skeletally mature adult.[3-18] Also new increased growth of exostosis in adult should raise the suspicion of malignant transformation into peripheral chondrosarcoma since osteochondroma is unusual to enlarge after maturity [19]. Another features that should brought the attention is the proximal location of tumor such as around the pelvis or shoulder, grossly irregular surface, cystic changes and soft tissue invasion.

Chondosarcoma arising in osteochondroma is usually of low grade as the trabecular bone permeation is usually absent, in addition, the cytological features may be bland with the exception of loss of columnar arrangement of the chondrocytes. This laid a hard work on the pathologist and necessitate clinico-radiological-pathological correlation for such a diagnosis.[19] Eefting *et al* suggested a statistically significant pathological criteria that could distinguished low grade ( G 1) chondrosarcoma from proximally located benign cartilaginous tumors [20]. Such a histological features included increased cellularity , nuclear pleomorhism, mitosis, entrapment, mucoid changes and loss of normal cellular arrangement. These features are added to the clinical data including age of patient above 40 years, proximal location and radiological data

Few studies work on demonstration of proliferative activity of osteochondroma cartilage in children comparing with proliferative activity in premature growth plate and in adult using immunohistochemistry with Ki 67 antibodies[21 ]. Ki 67 is a nuclear non histone protein that is expressed in all phases of cell cycle with exception of G0.[22] most articles focused on cartilage cap thickness as the main indicator of malignant transformation. However no enough previous studies act on demonstration of the significance of atypical histological changes as a premalignant precursor in mature osteochondroma regardless of the cap thickness. In this study, the proliferative activity of cartilaginous cap of osteochondroma will be studied in skeletally mature patients regardless of the cap thickness in order to demonstrate the independent significant of atypical histological features in predicting the malignant potential in osteochondroma. Also there will be a focus on the relashionship between unusual histological features in osteochondroma( increased cellularity, occasional binucleation and mild pleomorphism) with shape of the lesion ( sessile or pedunculated ).

## Methodology

Part of cases for study are collected from Al Hilla Teaching Hospital and Al-Hayat hospital retrospectively from the last 4 years ( 2015-2018). Cases with insufficient clinic-radiological data are ignored. The other part is selected prospectively from the work of orthopedic author ( use of suitable longitudinal incision to expose the tumor, careful dissection with radical excision of osteochondroma from its base with the mother bone with its basal cortex to avoid recurrence) . Exclusion criteria: osteochondroma from skeletally immature cases were excluded.

**Inclusion criteria:** all skeletally mature osteochondroma regardless of cartilage cap thickness were included.

**Ethical issues:** no patients identity or identifying photos are included in the study, so the permission of the institute, where the data are collected (including radiological and clinical information, as well as histological slides and paraffin blocks), is taken. The total number of collected cases was 130. Orthopedic author reviewed the radiological picture for each case and separate them into skeletally immature cases (excluded from the study) and skeletally mature cases (included) , so the final number of cases was 78 case. Also the included cases were divided into sessile shape lesions and pedunculated shape lesions. All study's cases were reviewed by two pathologists blindly from each other and without any clinical information. Cases are separated into group 1 (conventional osteochondroma

with no atypical histological features) and group 2 (osteochondroma with atypical histology).

Atypical histology defined by presence of increased cellularity, binucleated chondrocytes, occasional more than one cell in the lacuna, and mild pleomorphism with absence of other features that raise the suspicion of chondrosarcoma such as irregular arrangement of chondrocytes( not in ordered columns), mitosis, marked pleomorphism, necrosis, permeation and marked myxoid changes and separation of cells into specific lobules by fibrous bands.

Cases of both groups are then stained immunohistochemically with MIB 1 antibody (mouse monoclonal antibody, Dako 1:50). Three µm sections are cut, deparaffinized, rehydrated and stained with standard procedure. Heat induced antigen retrieval is used for all sections. Nuclear staining of Ki 67 was scored using the average method [22] by manual counting of Ki67 positive cells in three representative sections for each case and calculating the average percentage of positive cells by two pathologists.

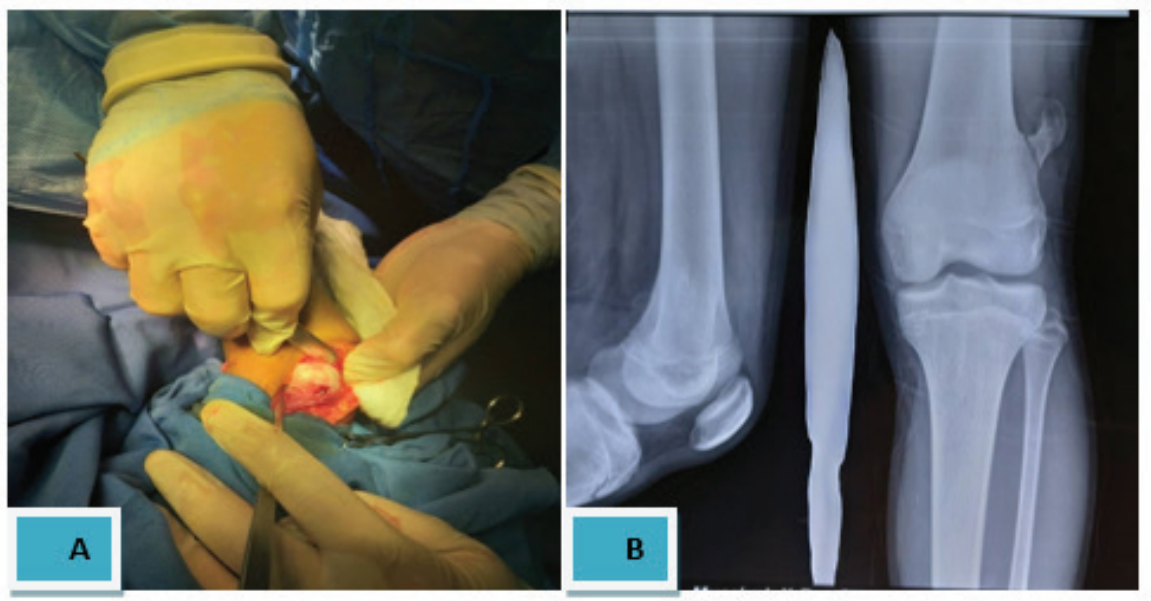


**Figure (1) : A an intra-operative picture of osteochondroma in 20 years old male show pedunculated shape tumor. B X-ray of 32 years old patient show osteochondroma in skeletally mature skeleton at lower femur and complicated by basal fracture. (our cases).**

## Data Analysis

Statistical analysis was carried out using SPSS version 21. Categorical variables were presented as frequencies and percentages. Pearson's chi square ($X^2$) was used to find the association between categorical variables. A *p*-value of ≤ 0.05 was considered as significant.

## Results

The Distribution of Patients According to Study Groups

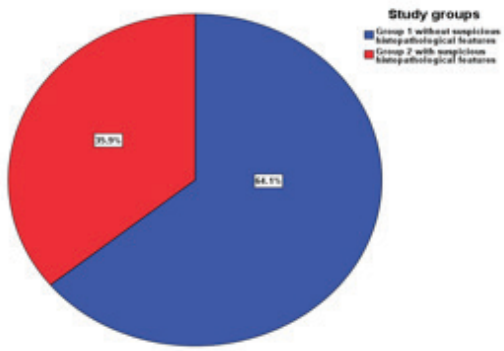


**Figure (2) shows distribution of patients according to study groups including (group 1 osteochondroma without suspicious histo-pathological features and Group 2 osteochondroma with suspicious histopathological features). Majority (64.1%) of patients presented with osteochondroma without suspicious histo-pathological features.**

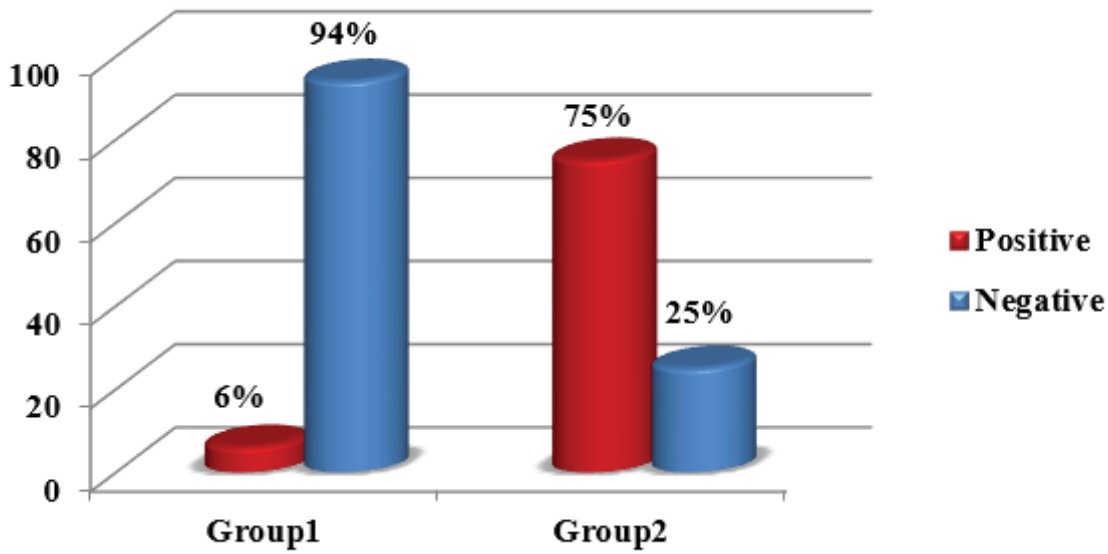


**Figure 2: Distribution of patients according to study groups**

The distribution of study groups according to Ki 67 staining results

Figure (3) shows distribution of study groups according to Ki 67 staining results including (Positive and negative). Majority (75%) of patients with osteochondroma with suspicious histopathological features had positive Ki 67 staining.

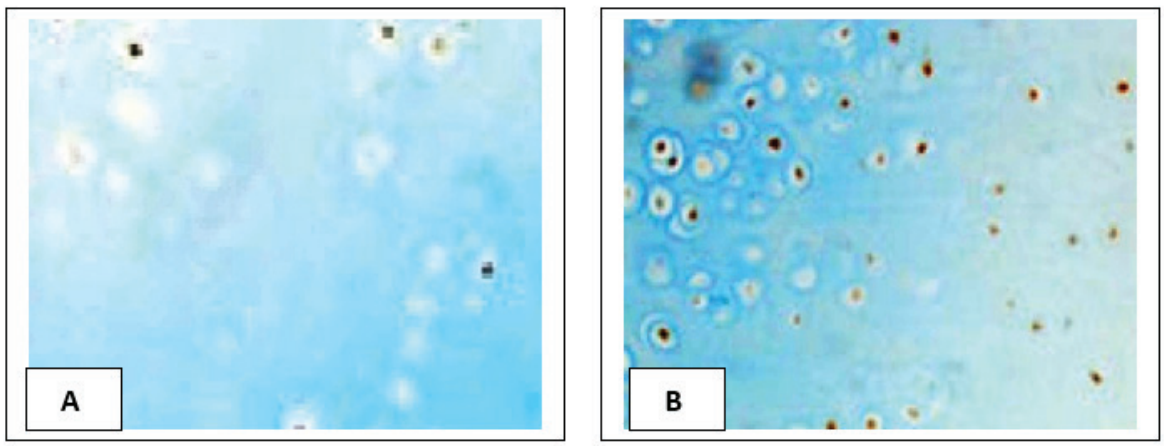


**Figure 3: Distribution of study groups according to Ki 67 staining results**

**Figure( 4 ): A** osteochondroma in 25 years male with conventional histological features (group 1) show negative Ki 67 staining. **B** osteochondroma in 32 years old male with increased cellularity and occasional binucleation (group 2), show positive Ki 67 staining.

**The Distribution of Study Groups According to Shape of Lesion**

Figure (5) shows distribution of study groups according to shape of lesion including (pedunculated and sessile). More than a half of patients with osteochondroma in two groups had pedunculated shape of the lesion.

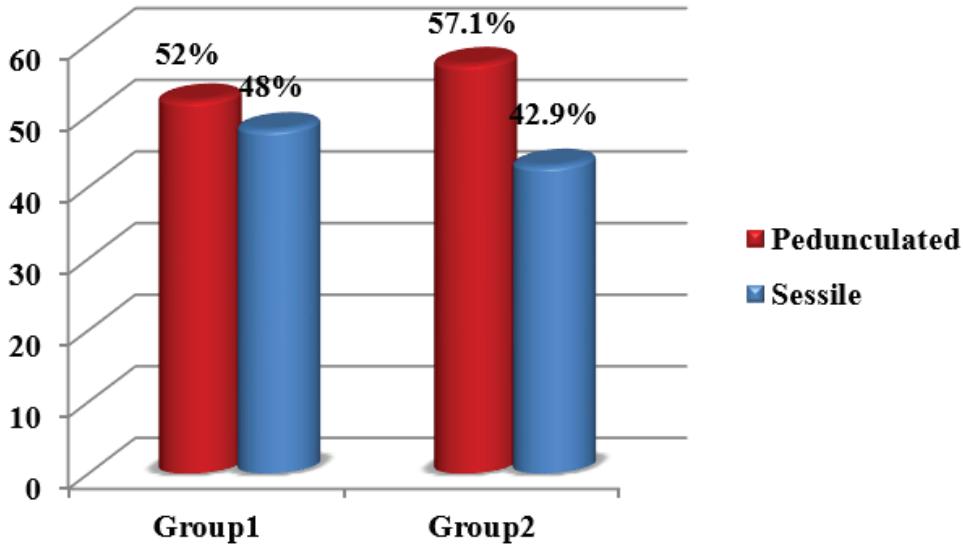


**Figure 5 : Distribution of patients according to shape of lesion**

**The association between study groups and study variables**

Table (1) shows the association between study groups including (group 1 osteochondroma without suspicious histopathological features and Group 2 osteochondroma with suspicious histopathological features), and study variables including (Ki 67 staining results and shape of the lesion).There was significant association between study groups and Ki 67 staining results, majority (75%) of patients with suspicious histopathological features presented with positive results of Ki 67 staining ( p value < 0.001). while there was no correlation between shape of lesion and histopathological features ( p value 0.662).

**Table (1) Association between study groups and study variables including ( Ki 67 stain results and shape of lesion)**

| **Study variables** | **Study groups** | | **Total** | $\chi^2$ | **P-value** |
|---|---|---|---|---|---|
| | Group 1 | Group2 | | | |
| **Ki 67 staining** | | | | | |
| Positive | 3 (6.0) | 21 (75.0) | 24 (30.8) | **40.11** | **<0.001*** |
| Negative | 47 (94.0) | 7 (25.0) | 54 (69.2) | | |
| Total | 50 (100.0) | 28 (100.0) | 78 (100.0) | | |
| **Shape of lesion** | | | | | |
| Pedunculated | 26 (52.0) | 16 (57.1) | 42 (53.8) | 0.191 | 0.662 |
| Sessile | 24 (48.0) | 12 (42.9) | 36 (46.2) | | |
| Total | 50 (100.0) | 28 (100.0) | 78 (100.0) | | |

*P value ≤ 0.05 was significant. (group 1 osteochondroma without suspicious histopathological features, Group 2 osteochondroma with suspicious histopathological features).

## Discussion

In a large studies reported by Mayo Clinic, it had been found that (81% ) of secondary chondrosarcoma arose at site of previous osteochondroma [23]. It has been estimated that 2/3 of these cases derived from sporadic osteochondroma. Although osteochondroma is rarely (1-2%) transformed into chondrosarcoma, its recognition is of high importance because most of these tumors are low grade and treated by adequate excision without need for chemotherapy or radiotherapy.[24] Huch et al performed a study on a group of solitary osteochondroma and other group of patients with multiple osteochondroma, comparing the immunohistochemical expression of Ki-67 in both groups as a marker of nuclear proliferative activity. They found that the proliferative activity in osteochondroma from patients younger than 14 years of age is similar to that in postnatal growth plate, while in individuals older than 14 years there was no significant detectable proliferative activity[ [21]. So , in the current study the only skeletally mature cases are included to avoid such overlap in the results of immunohistochemical staining with Ki-67 . In a study of de Andera *et al*, only cellular pleomorphism and mitotic activity show significant difference between osteochondroma and low grade chondrosarcoma on one hand and high grade chondrosarcoma on the other hand. While other cellular features as binucleation , necrosis, and irregular calcification was found in 72% of osteochondroma.

K. Huch et al supported the concept of increased suspicion for malignant transformation in osteochondroma of adult when Ki 67 positivity is detected [21]

The shape of osteochondroma ( pedunculated versus sessile ) was not studied previously regarding their relation to the microscopical features that raise the suspicion about malignancy ( increased cellularity, frequent binucleation, nodularity and necrosis). We found that no relation between the shape of the lesion and such a histological features. However the shape of the lesion may affect the accuracy of radiological diagnosis of osteochondroma ( more difficult in sessile tumors) as mentioned previously by Mark D. Murphey [2]

## Conclusion

Histopathological features , when atypical, can be regarded as independent alarming factor for malignant transformation ( the same as cartilage cap thickness and may precede it). There is no relation between shape of osteochondroma and risk of atypical histological features, proliferation, and hence risk of malignancy.

**Acknowledgment :** We are grateful for lab staff in Al- Hilla Teaching Hospital and Al- Hayat hospital for their help in data collection.

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest**: The authors declare that they have no conflict of interest.

**Funding**: Self-funding

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# Vitamin D Level Status and hypertension among Elderly Iraqi People in Al Hillah City

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## Abstract

**Background:** Vitamin D has different biological actions in the body . Vitamin D has the pleiotropic effects in multiple organ systems, and vitamin D deficiency was suggested to be associated with high blood pressure according to previous reports. Several interventional studies have examined the effect of vitamin D supplementation on high blood pressure patients

**Objective :** to identify Vitamin D level and its correlate with hypertension among old adult in Hilla city – Babylon province

## Introduction

Vitamin D, 25-hydroxyvitamin D (25(OH) D), is a dynamic fat-soluble vitamin that regulates calcium homeostasis and is important for bone and muscle health in people of all ages [1]. Vitamin D is logically present in some nutrients and dietary supplements and is formed endogenously when sunlight strikes the skin and motivates vitamin D synthesis. Serum concentration of 25-hydroxyvitamin D is the best indicator of vitamin D status in persons, with values of less than 30nmol/L (nmol/L = 0.4 ng/mL) measured to be insufficient for the universal health and wellbeing of adults [2]. A plethora of epidemiological and observational studies have established the correlation between vitamin D and general human wellbeing [(3–5)]. Studies suggest that adequate serum vitamin D of more than 30 nmol/L is concerned in avoiding cardiovascular disease [6] . An sufficient vitamin D serum level has also been informed to improve the immune system, avoid cancer, and limit its development [7]. Vitamin D is an essential part of nutrition. In association to the other vitamins, vitamin D has single metabolic and physiological special effects.[(3–7)] The deficiency of vitamin D is epidemically prevalent in the world; 20–25% of the population suffers from the deficiency of vitamin D in USA; Canada; Europe; Mexico; Asia; and Australia. [8] Surprisingly, the deficiency of vitamin D in the Persian Gulf nations is highly widespread, though there is adequate sunshine. The commonness of vitamin D (serum level of vitamin D) deficiency is upper among female adolescents and elderly in Iran and >80% in Saudi Arabia. Hypertension, also known as raised blood pressure, is a very common chronic disease and considered as a silent killer because it rarely causes symptoms(3). Generally, older age, lower incomes and higher body mass index are proposed as the associated factors with the risk of hypertension46). Accordingly, people having high blood pressure would increase in the condition of population ageing and prevalent westernized diet in Korean society(16). Therefore, it is very important to look into the evidences and results about vitamin D in regards with its roles in controlling blood pressure at this point.

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## Methodology

This was across sectional descriptive observational study included a non-probability ( convenient sample ) of elderly in Hilla City.

– Babylon province, the period of the study started from the first of January through August 2019, a pretested

questionnaire was used to interview the participants after obtaining their verbal consents, the sample included old adult, serum level of Vitamin D that made by chemo immunoassay method (maglumi instrument),The data were analyzed statistically to assess the associations between variables.

## Results

The study included 300 participants 83.0% of the study sample had either insufficiency or deficiency of Vitamin D level. The proportion of adults with hypertension were more common among participants with deficient and insufficient vitamin D, 42% and 7% respectively , the difference was significant p<0.05.

**Table (1) the mean age and number of participations.**

| Parameter | Number | Mean of the age |
|---|---|---|
| 65-69 years | 168 | 67 years |
| 70 -74 years | 84 | 73 years |
| 75-80and more | 48 | 78 years |
| Total | 300 | |

This table shows distribution of study participants according to the mean age and number of participations.

**Table (2) Means of vitamin D level by gender.**

| | |
|---|---|
| Female | 19.5% ng/ml |
| Male | 25.8% ng/ml |
| Male and female | 22.5% ng/ml |

**This table shows distribution of study participants according to the means of vitamin D level by gender.**

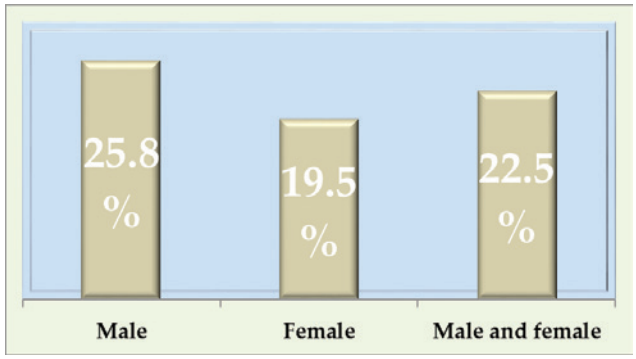


**Figure (2) Means of vitamin D level by gender.**

**Table (3) Frequency distribution of the study group of age.**

| Parameter | Frequency | percentage |
|---|---|---|
| 65-69 | 168 | 56.0% |
| 70 -74 | 84 | 28.0% |
| 75-80 and more | 48 | 16.0% |
| Total | 300 | 100% |

**This table shows distribution of study participants according to the age**.

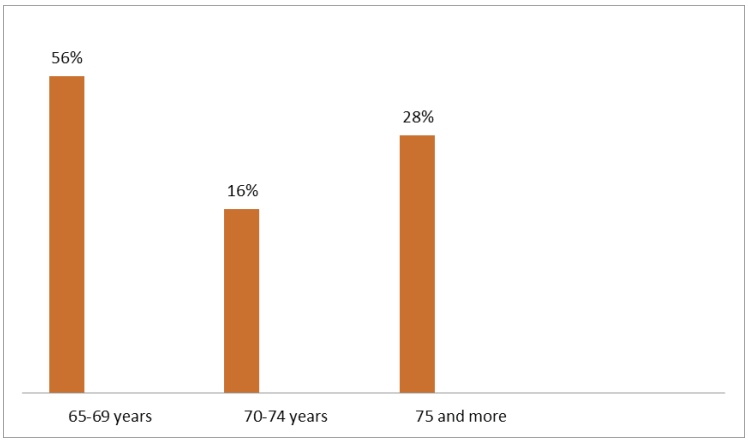


**Figure (2) Frequency distribution of the study group by age.**

**Table (4) Association between Vitamin D Hypertension) among males.**

| Study variables | Vitamin D level among male | | | | | χ2 | P-value |
|---|---|---|---|---|---|---|---|
| | Deficiency (0-20 ng/ml) | Insufficiency (21-29 ng/ml) | Normal (30-100 ng/ml) | Total | Deficiency | | |
| Hypertension Yes | 37 (54.4%) | 5 (26.3%) | 2 (15.3%) | 44 | 84.0% | 57.99 | < 0.002* |
| No | 31 (45.6%) | 14 (73.7%) | 11 (84.7%) | 56 | 55.3% | | |
| Total | 68 (100.0%) | 19 (100.0%) | 13 (100.0%) | 99 | | | |

This Table shows Association between Vitamin D Hypertension) among males.

**Table (5) Association between Vitamin D and Hypertension)among females.**

| Study variables | Vitamin D level among female | | | | | χ2 | P-value |
|---|---|---|---|---|---|---|---|
| | Deficiency (0-20 ng/ml) | Insufficiency (21-29 ng/ml) | Normal (30-100 ng/ml) | Total | Deficiency | | |
| Hypertension Yes | 90 (66.1%) | 16 (72.7%) | 5 (11.6%) | 111 | 81.0% | 59.11 | < 0.001* |
| No | 46 (33.9%) | 6 (27.3%) | 38 (88.4%) | 90 | 51.1% | | |
| Total | 136 (100.0%) | 22 (100.0%) | 43 (100.0%) | 201 | | | |

**This table shows Association between Vitamin D and Hypertension)among females.**

## Discussion

In this study, the Vitamin D Level Status Among Iraqi Patients in Al Hillah City and the relation of these dependent variables to various epidemiological factors were assessed in 300 patents the most of sample are female 67% . The prevalence of vitamin D deficiency in those countries is higher in women than in men It seems that the skin complexion, poor sun exposure, vegetarian food habits and lack of vitamin D food fortification .

In this study most of patients are in the age group 65-69 years this result agree with (Heshmat et al 2008) who found that It was also indicated that vitamin D shortage is highest among individuals who are elderly, institutionalized, or hospitalized. It is recounted that 60% of the old adult in nursing homes were vitamin D deficient in the United States (Elliott et al.2003).

Findings of relationship between level of vitamin D and hypertension for male and female sample male and female have deficiency in the level of vitamin D (84 %) (81%). This results are agree with (Songcang 2017) who found that vitamin D deficiency is highest among people who have hypertension .

## Conclusion

Results of the current study showed a widespread, severe Vitamin D deficiency among participants of both sexes and in elderly people , urgent large scale public educational campaigns are needed to address this high priority public health problem in our society. We suggest that physicians should keep a check on the Vitamin D levels of elderly people in order to curb the ever-increasing incidence of hypertension.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the University of Babylon College of Nursing, Iraq and all experiments were carried out in accordance with approved guidelines.

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# Impact of Physical Activity Program upon Elderly Quality of Life at Al-Amara City/Iraq

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## Introduction

**Objectives**: The study aimed to evaluate the effectiveness of the physical activities program for the elderly among the quality of life; to determine association between elderly life qualities with their socio-demographic data.

**Method:** A quasi experimental design was carried out from 14th January 2019, to 20th September 2019 in the city of Al-Amara. A random sample was used to select 6 out of 14 primary health care centers. A purposive sample was used through inclusion and exclusion criteria include (50) elderly visiting health centers for therapeutic or preventive reasons. The collected sample was divided equally (25) into two groups of men and women (study and control group) while the first group underwent an activity program. The data of the study were collected through the interview method and using the designed tool which contained (3) parts.

**Results**: The findings of the study show that the two groups have a low level of activity and quality of life for the elderly before the program is conducted, while after the implementation of the program, the study group showed a significant improvement in physical activities at a high level score (2.36± 0.209), while the control group stay in same level score (1.37± 0.183). Quality of life demonstrated very good level score for post–test in the study group (3.91± 0.436) more than control group (1.73± 0.203).

***Key words:*** *Elderly, Quality of Life, Physical Activity, Primary Health Care.*

## Introduction

Elderly is a fragile and vulnerable segment of population need especial care due to the multiple problems which leads to a decline in the body's physical capacity and physiological system [1] . World Health Organization (WHO) mentions that there are more than six hundred million elderly people worldwide; it is estimated that this rate will double by 2025 and 2 billion by 2050 [2] . The annual statistical report issued by the Iraqi Ministry of Health showed that the proportion of elderly people over 60 years of age is expected to increase 3.4% in 2010 to 5% in 2015, and the increase is expected to reach 7.2% in 2050 [3] .

The views of most gerontologists agree that the ages of the elderly are 65 years and older. This age is the length of time that people are approaching the end of their occupation, work and the preparation of retirement plans. In addition, they work to end their responsibilities, duties and tasks that they performed during adulthood and thus they become inactive [4] . Global reports indicate that physical inactivity is continuous increasing. The prevalence of physical inactivity is estimated at 21.4% worldwide. In England, nearly 39% of the elderly performed the recommended levels of physical activity, while in the United States about 23% were considered physically inactive and therefore had many health problems[5]. Physical activity (PA) is "Any bodily movement produced by skeletal muscles those results in energy expenditure". All activities carried out by the elderly that is includes walking, leisure-time activity, regular exercise, housework, and work-related activity can offer many benefits through physical, psychological and social aspect in the elderly life qualities [6] .

Generally, to achieve a better healthy life, it is preferable for the elderly to engage in physical activity on an ongoing basis. Based on this principle, most health education programs are available in most countries to

disseminate new ideas and knowledge, which in turn promotes health and prevents risky behaviors [7] . Finally, it is necessary to integrate physical activity into the lives of older people as a way to improve their QoL. Participation in lifestyle activities impacts upon physical, social, psychological, and environmental well-being for individuals all of these elements lead to for integration of life quality [8]

## Methodology

A semi-experimental design was used during the period 14th January 2019, to 20th September 2019, Simple random sample is used by the researcher to select (6) primary health care centers (PHCs) at Al-Amara city. A purposive sample (50) elderly visiting PHCs for therapeutic or preventive reasons, these elderly were collected from the centers. The sample comprised of (50) elderly people who agreed to participate in the program were divided into two groups, each group of study and control consisted of (25) elderly, the first group was involved in the activity program, while the second group was not exposed to the program. Data were collected through interview technique based on inclusion criteria for both sexes including: elderly people at an early age 65-74 year, mobile, independent, and able to communicate with others. The exclusion criteria included elderly with chronic diseases (asthma, diabetes, non-controlling blood pressure, and congestive heart failure).

The program includes six time-consuming lectures (45-60 minutes) to educate the elderly about physical activities and conduct pre- and post-program tests to assess effectiveness on quality of life. The questionnaire was used as a tool to collect data through the interview technique used and observation the practices of the elderly. The first part contains demographic characteristics, while the second part relates to the PA tool which includes (24) elements divided into four parts includes leisure time, household activities, balance, and flexibility exercises. The third part was used to measure the QoL of the elderly, through constructed questionnaire which contains (31) items, the first domain include three items about overall QoL and overall health status, while the remaining 28 questions were divided into five dimensions of health including: physical, psychological and emotional, social relationships, environment, and spiritual health. Summing the total scores for each certain domain manifested the elderly perception about their QoL. These items was rated according to the Likert scale and the scoring for these questions was range from (1 to 5), the higher scores corresponding to a better QoL classified as (5), while low scores classified as (1). The allocated time for the questionnaire was (20-30) minutes to complete. This scale was evaluated according to five levels as following: Low level = (1-1.80): 1; Moderate (1.81- 2.60): 2; Good level (2.61- 3.40): 3; Very good (2.41- 4.20): 4; Excellent (4.21- 5): 5. The Physical Activity Tool was rated according to Likert scale (Always; sometimes and never), and scoring as (3) for always, (2) sometimes, and (1) never, respectively. This scale was evaluated according to four levels: Low level =(1.00-1.66): 1; Moderate (1.67- 2.33): 2, and High (2.34- 3.00): 3. The time practice of PA checklist for each elderly took about (120-180) minutes. The validity and reliability of the questionnaire is determined by a panel of (16) experts and degree of Alpha Cronbach for QoL and PA for (31) items (r= 0.88) and (24) items (r= 0.86) respectively.

Our study data were analyzed by using the Statistical Package for Social Sciences (SPSS) version 20, and through applying two statistical approaches (1) descriptive by: percentage, frequency, standard deviation and arithmetic mean (2) inferential analysis through (t-test, and chi-square test) to determine relationship between the study and control groups. The results were affirmed as significant at $P \leq 0.05$ and no significant at $P > 0.05$.

## Study Finding

The results of the data analysis were consistent with the objectives of the study. The presentation below shows the important findings of the study.

**Table (1) Distribution of the study and control group according (Physical Activities) with comparisons significant**

| Main Domains Related To Physical Activities | "Control" | | | | | "Study" | | | | | C.S. (*) Pre X Pre (C X S) | C.S. (*) Post X Post (C X S) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pre | | Post | | C.S. (*) | Pre | | Post | | C.S.(*) | | |
| | M.S | S.D. | M.S | S.D. | | M.S | S.D. | M.S | S.D. | | | |
| Leisure time activities | 1.73 | 0.465 | 1.69 | 0.410 | P=0.442 NS | 1.71 | 0.484 | 2.46 | 0.180 | P=0.000 HS | P=0.865 NS | P=0.000 |
| Household activities | 1.78 | 0.418 | 1.74 | 0.423 | P=0.610 NS | 1.68 | 0.606 | 2.46 | 0.189 | 0.000 | P=0.517 NS | 0.000 |
| Balance exercise | 1.00 | 0.000 | 1.00 | 0.000 | --- NS | 1.00 | 0.000 | 2.38 | 0.169 | 0.000 | --- NS | 0.000 |
| Flexibility exercise | 1.00 | 0.000 | 1.00 | 0.000 | P=1.000 NS | 1.01 | 0.040 | 2.42 | 0.226 | 0.000 HS | P=0.327 NS | P=0.000 HS |

**C.S. = comparison significant, S= significant, NS= no significant, HS= High significant.**

**Table (2): Distribution of the studied groups according to (Quality of Life) with their comparisons significant**

| Main Domains Related To QoL | Control | | | | | Study | | | | | C.S. (*) Pre X Pre (C X S) | C.S. (*) Post X Post (C X S) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pre | | Post | | C.S. (*) | Pre | | Post | | C.S.(*) | | |
| | M.S | S.D. | M.S | S.D. | | M.S | S.D. | M.S | S.D. | | | |
| Life Overall | 1.99 | 0.414 | 2.11 | 0.416 | P=0.131 NS | 1.69 | 0.480 | 3.85 | 0.510 | P=0.000 HS | P=0.025 S | 0.000 HS |
| The Physical Health facet | 1.94 | 0.691 | 2.15 | 0.585 | P=0.036 S | 1.70 | 0.539 | 4.08 | 0.532 | 0.000 HS | 0.184 NS | 0.000 |
| The Emotional and Psychological facet | 1.54 | 0.354 | 1.64 | 0.307 | P=0.057 NS | 1.40 | 0.330 | 3.83 | 0.535 | 0.001 HS | 0.155 NS | 0.001 |
| The Social Relationships facet | 1.71 | 0.689 | 2.03 | 0.569 | P=0.012 S | 1.44 | 0.459 | 4.03 | 0.552 | 0.002 HS | 0.114 NS | 0.002 |
| The Environment face | 1.56 | 0.311 | 1.63 | 0.237 | P=0.229 NS | 1.40 | 0.248 | 3.83 | 0.477 | 0.000 HS | 0.057 NS | 0.000 |
| The spiritual facet | 1.64 | 0.376 | 1.74 | 0.453 | P=0.246 NS | 1.45 | 0.354 | 3.91 | 0.590 | P=0.000 HS | P=0.072 NS | 0.000 |

**C.S. = comparison significant, S= significant, NS= no significant, HS= High significant.**

**Table (3): Overall Assessment among the Pretest and Posttest Periods for the elderly (PA and QoL) for Study and Control Group (1.00– 1.66): Low; (1.67 – 2.33): Moderate, and (2.34 – 3.00): High. L: Low, M: Moderate, H: High.**

| Variables | Overall Assessment | | Study | | Control | |
|---|---|---|---|---|---|---|
| | | | Freq. | % | Freq. | % |
| Elderly Physical Activity | Low: (1.00 – 1.66) | Pre-test | 18 | 72.0 | 19 | 76.0 |
| | Moderate: (1.67 – 2.33) | | 7 | 28.0 | 6 | 24.0 |
| | High: (2.34 – 3.00) | | 0 | 0.00 | 0 | 0.00 |
| | Total | | 25 | 100.0 | 25 | 100.0 |
| | $\pm$S.D$\bar{x}$ | | 1.39$\pm$0.251 | | 1.37$\pm$0.197 | |
| | Low | Post-test | 0 | 0.00 | 20 | 80.0 |
| | Moderate | | 3 | 12.0 | 5 | 20.0 |
| | High | | 22 | 88.0 | 0 | 0.00 |
| | Total | | 25 | 100.0 | 25 | 100.0 |
| | $\pm$S.D$\bar{x}$ | | 2.36$\pm$ 0.209 | | 1.37$\pm$ 0.183 | |
| Elderly Quality of Life | Low(1.00 – 1.80) | Pre-test | 20 | 80.0 | 19 | 76.0 |
| | Moderate(1.81 – 2.60) | | 5 | 20.0 | 6 | 24.0 |
| | Good(2.61 – 3.40) | | 0 | 0.00 | 0 | 0.00 |
| | Very Good(3.41-4.20) | | 0 | 0.00 | 0 | 0.00 |
| | Excellent(4.21-5.00) | | 0 | 0.00 | 0 | 0.00 |
| | Total | | 25 | 100.0 | 25 | 100.0 |
| | $\pm$S.D$\bar{x}$ | | 1.58 $\pm$0.241 | | 1.58$\pm$0.333 | |

**Freq.=Frequencies, %=Percentages,$\bar{x}$ $\mp$ S. D.$\bar{x}$ $\mp$ S. D.=Arithmetic Mean ($\bar{x}$)$\bar{x}$)and Std. Dev. (S.D.).**

**Table (4): Association between the elderly Quality of life with their Socio-demographic Variables for study group**

| Elderly Variables | Pre- Test | | | | Post- Test | | | |
|---|---|---|---|---|---|---|---|---|
| | Chi-Square | d.f | P value | Sig. | Chi-Square | d.f | P | Sig. |
| Age | 1.347 | 3 | 0.718 | NS | 101.387 | 3 | 0.000 | S |
| Gender | 8.692 | 3 | 0.034 | NS | 15.86 | 3 | 0.001 | S |
| Occupational Status | 30.128 | 9 | 0.000 | S | 35.353 | 9 | 0.000 | S |
| Marital status | 7.203 | 6 | 0.302 | NS | 69.249 | 6 | 0.000 | S |
| Education levels | 47.615 | 15 | 0.000 | S | 48.338 | 15 | 0.000 | S |
| Monthly Income | 20.514 | 6 | 0.002 | S | 19.955 | 6 | 0.003 | S |

**Sig.= Significant, S= Significant at( P< 0.05), NS= Non Significant at (P > 0.05), d.f = degree of freedom, P = probability value.**

Regarding association, the table showed that there was no significant relationship between elderly QoL with age, sex and presence of spouse or not, except (profession, education, monthly income) show significant differences in pre-test ($P < 0.05$). While, in the post test the results of the table above shows that there is a significant relationship between quality of life of the elderly with all demographic variables, when analyzed by chi-square.

## Discussion

In our study, shows that there are highly significant differences (P=0.000) with very good levels at study group for all domains QoL which includes: life overall, physical health, emotional and psychological, social, the environment, and spiritual facet. In agreement with this study Pucci et al., [13] found positive correlations between health perceived by elderly and the time practicing physical activity. Also, Ludendorff et al.; Naji and Abdulridha [14 ,15] confirm the elderly who are physically and mentally active demonstrate and can perceive better performance of activities, better health and, therefore, better quality of life.

The results revealed that there is no significant relationship between the QoL of the elderly with their social and demographic data in the pre-test of the study group, whereas in the post-test period there was a significant association about these variables in ($P <0.05$). This findings were supported by Hamer et al., [16] who stated that maintaining a lifestyle physically active by the elderly at an early age (65 and above) leads to better health, longevity and healthy ageing in comparison with those remaining inactive lifestyle. Ramocha et al., [17] in study conducted in South Africa that show there are significant association between elderly QoL and their gender at ($P= 0.001$) after participation in physical activity program. In agreement of our study, Ramires et al., [18] in their study, they mentioned that retirement status and lower monthly income for seniors may reduce transportation and work-related activities, which may also be replaced by many activities such as leisure time, household…etc., thus are important factors in improving the QoL of older people. In regarding to marital status and education level, the result shows a significant association with QoL in the post-test at very good level for life quality. This result may come from spousal support and completion of school education which plays an important role to ensure that older persons remain physically active through internal / external activities, including gardening, shopping, walking, sexual relationship and religious activities, which improve their satisfaction with life.

## Conclusion

The study showed that elderly physical activities and quality of life were low at the beginning of the program. However, these variables in the study group increased significantly in the post-test at a high level as a result of participation in the physical activity program. Regarding the relationship between quality of life and demographic data, the result showed that there was no significant relationship in the pre-test except (educational level, occupation and financial situation), but there was a high statistical significance between gender, age, occupation, marital status, education and monthly income with the quality of life of the elderly.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

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# Fear and Anxiety Disorders Related to Childbirth among Primiparous Women in Kirkuk City

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## Abstract

**Objective:** This study aimed to assess the level of fear of childbirth and level of anxiety among primiparous women; and find out the relationship between fear of childbirth & level of anxiety and some socio-demographical data of the sample.

**Methodology:** A descriptive study, non-probability (Purposive) sample consist of 100 nulliparous pregnant women was carried out from November , 1st, 2018 to October, 10th, 2019 in (AL Salam) primary health care center and two hospitals (Azadi teaching & Kirkuk general) at gynecological consultation in Kirkuk city. To achieve the objectives of the study a developmental & constructed questionnaire conducted for the purpose of the study, which consisted of three parts: the socio-demographic characteristics; Anxiety scale for pregnancy (ASP) it consists of 14-items to determine the severity of the anxiety symptoms & the Wijma Delivery Expectancy/ Experience Questionnaires (W-DEQ) consist of 33 items was used to investigate fear of childbirth**.**

**Results**: The majority of the pregnant women (39%) aged group (26-30years), (48%) was gestational age/ week 14-26 weeks, (33%) of them graduated from secondary school, regarding to the occupation (63%) was housewife, financial status was barely sufficient and constitute (86%), and (99%) of them from urban residency, tenant housing (82%), nucleus family type (86%), and (73%) of them preferred normal vaginal delivery mode and ( 96%) of the women were regularity antenatal visiting.

**Conclusions:** The study detected a severity of the anxiety related pregnancy was moderate, and level of fear of childbirth was mild. Also founds a significant relationship between anxiety level and age of primiparous women.

***Keywords:*** *Fear, Primiparous Women, Childbirth , ASP, W-DEQ, Stress, Pregnancy Related Anxiety*

## Introduction

Childbirth is a significant physiological, social and emotional event in the life of a woman and her family; however, it is seen as a problem in terms of psychological anxieties for pregnant women. [1] Fear of childbirth is common and more intense in pregnant primiparous women than in pregnant parous women. The fear can easily lead to avoidance including the widespread demand for epidural analgesia, or for an elective caesarean section. They may be also fear of giving birth to a baby with congenital anomalies, or about problems perinatal that can compromise their life or health. Women with afraid of childbirth are vulnerable to increased surgical intervention and subsequent psychological problems. [2] Pregnant women with a clinically significant worries of childbirth appear to have personalities with strong neurotic traits. Even low self-efficacy and low self-esteem appear to increase significantly the risk that a woman will experience high distress at the time of delivery. [3] A variety of issues in pregnancy may increase anxiety in women, among such issues are fear about childbirth and health of the baby, quality of care during delivery, the extent of husbands' support and involvement in maternal health care, and the level of support from relatives and friends. [4] Pregnancy

anxiety is different from general anxiety. It is a relatively distinct syndrome which is provoked by pregnancy-specific fears and worries. Women who are anxious, experience both emotional and somatic symptoms such as worry, muscle ache, palpitation, sleep disturbance, and gastrointestinal problem. It has been suggested that high levels of pregnancy-related anxiety play a role in preterm birth, postpartum depression, and caesarean section. In addition, it could affect fetal, infant and child development. [5,6] Women still suffer from the fear of death during labor. When this specific anxiety or fear of death during labor precedes pregnancy and is so intense that tokos (childbirth) is avoided whenever possible, this is a phobic state called "tokophobia". Tokophobia may effect women from childhood into old age. [7] More recently, pregnant women fearful of childbirth reported a lack of trust in the obstetric staff team, fear of their own incompetence and fear of dying. Other studies have suggested that the greatest fear was of labor a physically damaged or congenitally anomalies child. Women may be worried about their ability to give birth. Studies show that the prevalence of moderate childbirth fear in pregnant women varies between 18–31%, and the prevalence of severe fear of childbirth is between 2–11%. [8]

## Methodology

### *Participants*

A descriptive study, non-probability (Purposive) sample consist of 100 primiparous pregnant women was carried out of from November , 1st , 2018 to October, 10th , 2019 in (AL Salam) primary health care center and two hospitals (Azadi teaching & Kirkuk general) at gynecological consultation in Kirkuk city.

### Data Collection

All the women were informed about the study and their consent was obtained. The data were obtained through interview (face to face) by the researcher.

### *Instrumental*

*Socio -demographic characteristics:* Consists of the questions containing information related to primiparous women's.

*The Wijma Delivery Expectation / Experience Questionnaire (W-DEQ-A):* It is a Likert-type scale consisting of 33 items was used to investigate fear of childbirth. It has 6 subscales and each question is scored from 1 to 6 points. [9]

*Anxiety scale for pregnancy:* consist 14 items, 7 positively worded and 7 negatively worded, with items responses ranging from "not at all" (1 item) to "very much" (4 items). Developed to determine the severity of the anxiety symptoms, this scale consists of 14 questions and total scores which ranged from 14 to 56.

### *Statistical analysis*

The data were analyzed through the use application of descriptive statistical analysis (Frequency, Percentage (%) & Mean of score) and inferential statistical (ANOVA) by using (SPSS) version (23).

## Results

**Table (1) Distribution of primiparous women according to the severity level of anxiety related pregnancy**

| No. | Level of anxiety | Frequency ( f ) | Percentage (%) |
|---|---|---|---|
| 1. | Normal | 2 | 2.0 |
| 2. | Mild | 39 | 39.0 |
| 3. | Moderate | 57 | 57.0 |
| 4. | Sever | 2 | 2.0 |
| Total | | 100 | 100.0 |

**Table (2) Distribution of primiparous women according to the severity of childbirth fear used (W-DEQ) during pregnancy**

| No. | Level of childbirth fear (W-DEQ) | Frequency ( f ) | Percentage (%) |
|---|---|---|---|
| 1. | Mild fear | 94 | 94.0 |
| 2. | Moderate fear | 4 | 4.0 |
| 3. | Sever fear | 2 | 2.0 |
| Total | | 100 | 100.0 |

The table (4) show that the severity of fear of childbirth had mild fear among most primiparous women (94%) by used (W-DEQ).

**Table (3) Comparison of the anxiety level and demographical characteristics among primiparous women.**

| Items | | Sum of Squares | DF | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Age | Between Groups | 6.764 | 3 | 2.255 | 2.574 | .058 S |
| | Within Groups | 84.076 | 96 | .876 | | |
| | Total | 90.840 | 99 | | | |
| Education | Between Groups | 2.706 | 3 | .902 | .639 | .591 NS |
| | Within Groups | 135.404 | 96 | 1.410 | | |
| | Total | 138.110 | 99 | | | |
| Occupation | Between Groups | .652 | 3 | .217 | .594 | .620 NS |
| | Within Groups | 35.138 | 96 | .366 | | |
| | Total | 35.790 | 99 | | | |
| Financial status | Between Groups | 1.002 | 3 | .334 | 2.474 | .066 NS |
| | Within Groups | 12.958 | 96 | .135 | | |
| | Total | 13.960 | 99 | | | |
| Gestational age/weeks | Between Groups | .441 | 3 | .147 | .276 | .843 NS |
| | Within Groups | 51.199 | 96 | .533 | | |
| | Total | 51.640 | 99 | | | |
| Housing | Between Groups | .306 | 3 | .102 | .677 | .568 NS |
| | Within Groups | 14.454 | 96 | .151 | | |
| | Total | 14.760 | 99 | | | |
| Family type | Between Groups | .205 | 3 | .068 | .553 | .647 NS |
| | Within Groups | 11.835 | 96 | .123 | | |
| | Total | 12.040 | 99 | | | |
| Preferred mode delivery | Between Groups | 1.213 | 3 | .404 | 2.098 | .106 NS |
| | Within Groups | 18.497 | 96 | .193 | | |
| | Total | 19.710 | 99 | | | |

**SOV**=Source of Variance, **SS=** Sum of Squares**, MS=**Mean of Score, F. Obs**=** Fisher Observation, **DF=** Degree of Freedom**, S =** Significant, **NS=** No Significant.

**Table (4) Comparison of the childbirth fear and demographical characteristics among primiparous women.**

| **Items** | | **Sum of Squares** | **DF** | **Mean Square** | **F** | **Sig.** |
|---|---|---|---|---|---|---|
| Age | Between Groups | 4.351 | 2 | 2.175 | 2.440 | .093 NS |
| | Within Groups | 86.489 | 97 | .892 | | |
| | Total | 90.840 | 99 | | | |
| Education | Between Groups | 2.807 | 2 | 1.403 | 1.006 | .369 NS |
| | Within Groups | 135.303 | 97 | 1.395 | | |
| | Total | 138.110 | 99 | | | |
| Occupation | Between Groups | 1.721 | 2 | .860 | 2.450 | .092 NS |
| | Within Groups | 34.069 | 97 | .351 | | |
| | Total | 35.790 | 99 | | | |
| Financial status | Between Groups | .556 | 2 | .278 | 2.011 | .139 NS |
| | Within Groups | 13.404 | 97 | .138 | | |
| | Total | 13.960 | 99 | | | |
| Gestational age/weeks | Between Groups | 1.071 | 2 | .535 | 1.027 | .362 NS |
| | Within Groups | 50.569 | 97 | .521 | | |
| | Total | 51.640 | 99 | | | |
| Housing | Between Groups | .207 | 2 | .103 | .689 | .504 NS |
| | Within Groups | 14.553 | 97 | .150 | | |
| | Total | 14.760 | 99 | | | |
| Family type | Between Groups | .125 | 2 | .063 | .509 | .603 NS |
| | Within Groups | 11.915 | 97 | .123 | | |
| | Total | 12.040 | 99 | | | |
| Preferred mode delivery | Between Groups | .359 | 2 | .179 | .900 | .410 NS |
| | Within Groups | 19.351 | 97 | .199 | | |
| | Total | 19.710 | 99 | | | |

**SOV**=Source of Variance, **SS=** Sum of Squares**, MS=**Mean of Score, F. Obs**=** Fisher Observation, **DF=** Degree of Freedom**, S** = Significant, **NS=** No Significant.

## Discussion

The objective of this study was to determine the level of fear of childbirth and anxiety level in pregnant women. In this study, the average scores of the W-DEQ-is mild and the ASP were determined at moderate level. Similarly, in the studies by Dağlar (2014) [10] , the ASP average score and in the studies by Subaşı, et. al (2013) [11] ,the W-DEQ-A average score were found moderate and these results disagree the findings in this study. The average W-DEQ-A and ASP scores of the primiparous women with low education level and their childbirth fear and anxiety levels were found high. Similarly, in the studies by Dağlar (2014) [10] , Laursen, et. al (2008) [12] , the childbirth fear and anxiety levels were found high for the pregnant women with low education level. In this context, it may be said that the information regarding pregnancy and birth is not provided suitably for their education level.

Therefore, the self-acquired, interpreted and audited information obtained from the visiting and attending primary health care center and private clinic about pregnancy and childbirth can be associated with the decrease levels of anxiety & fear. On the other hand However, Subaşı, et. al (2013) [11] reported that PT had an effect on reducing anxiety and childbirth fear. In this study, the pregnant women with preterm labor risk (14-26weeks) had moderate level of anxiety and low W-DEQ-A scores. Likewise, Şen & Şirin (2013) [13] and Alipour, et. al (2011) [14] suggested that the preterm birth risk increased the anxiety and childbirth fear. Women with sever antenatal levels of fear of childbirth may have an high risk of experiencing fear perinatal and appraise an ongoing delivery as threatening. Given the positive relationship between fear of childbirth and general symptoms of anxiety & depression Laursen, et. al (2008) [12] the fear of childbirth among primiparous women could possibly also be the result of a generalization of other anxieties. Since a biopsychosocial perspective, comprising several etiological factors, is typical for clinical anxiety, a complex etiology also for child-birth related anxiety would be of no surprise. In discard the anxiety and childbirth fear, psychological factors such as social and spousal support are high important (Sani, 2015) [15] . In this study, the anxiety level mean scores of the primiparous women with no social support other than their spouses were found low. Likewise, high anxiety and childbirth fear were found in the women with mild spouse support (Gao, et. al 2015) [16] and who were unsatisfied with their spousal support (Lukasse, et. al, 2011) [17] . The data of this sample, it can be said that spouse presence alone is not sufficient, they do not know the ways to cope with anxiety and fear, their education is incomplete, they also have childbirth fear and cannot perform intervention appropriately. In the limited studies carried out about the spouses, it was reported that fathers also have the birth fear (Hildingsson, et. al , 2014 [18] ; Bergström, et. al , 2013 [19] ). The level of birth fear, according to the average score of W-DEQ-A was low in those with extended families. In this study, it can be said that traditionally-structured family factor has an important place in the process of pregnant women and childbirth. When reviewed the studies parallel to this study, Laursen, et. al (2008) [12] found that the surplus of social support reduced the fear of birth and (Gao, et. al 2015) [16] , Şen & Şirin (2013) [13] reported high level of anxiety and birth fear in those with inadequate social support.

It was found that there was a relationship between the anxiety and fear of childbirth (Spice Jones, et. al, , 2009) [20] and the pregnant women with sever anxiety level had 2.4 times more childbirth fear. But in this study, the total W-DEQ-A score was mild, and the anxiety level scores also moderate. Saisto, et. al, (2001) [21] emphasized that anxiety is an important determinant in the increase of childbirth fear. Similarly, Subaşı, et. al (2013) [11] found a significantly positive relationship between the average W-DEQ-A and anxiety scores.

## Conclusion

The study detected a severity of the anxiety related pregnancy was moderate, and level of fear of childbirth was mild. Also founds a significant relationship between anxiety level and age of primiparous women. A non-significant relationship between fear of childbirth and socio-demographical characteristics among primiparous women. It is important for perinatal health caregivers (midwives and nurses) to ask pregnant women about their feelings related to the current pregnancy, childbirth, and future motherhood, and to give women who express fears an chance to discuss them, paying special attention to nulliparous women with negative experiences of earlier pregnancies. Training pregnant women about

childbirth can provide them with behavior control, development of positive feelings, an increase in the self-confidence and improvement in the birth process and its outcomes. Interventions should be proceed in high-risk women considering psychological variables

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Psychiatric & Mental Health Nursing, Iraq and all experiments were carried out in accordance with approved guidelines.

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# Effectiveness of an Educational Program on Nurses' Knowledge and Practices Concerning Nursing Care for Critically – Ill Patients at Critical Care Units in Misan Governorate Hospitals

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## Abstract

**Background:** Nursing care for critically ill patients includes the implementation of basic care tasks intended to enable patients to perform daily life activities. Critical care nursing provide specialized care to patients experiencing a life threatening or potentially life threatening illness. This care is complex, intensive and continuous.

**Objective:** The study aim to evaluate the nurses' knowledge and practices concerning nursing care for critically – ill patients at critical care units, and to construction of educational program.

**Methodology:** A quasi experimental design has been carried out in intensive care unit at Shaheed Al - Sadder teaching hospital and Al Zahrawi surgical hospital started from the 26th of June 2018 to the 30th of October 2019. Select purposive sample comprised of 60 nurses is divided into two groups equally, study group were exposed to the nursing educational program, and control group.

**Results**: The study reveal that the majority of nurses had moderate level knowledge and practices in pre test towards nursing care for critically- ill patients for both groups (study and control), total mean are with regard to knowledge (mean of study group = 0.45 and control group) = 0.42), and in practice (mean of study = 1.86 and control = 1.85). while for post-test presented improve in study group were (mean of the study = 0.83 and control = 0.42) with regard to knowledge, (Study mean = 2.62 and control group = 1.84) for practices.

***Keyword :*** *Effectiveness; Education Program; Nurse; Knowledge; Practice; Nursing Care; Critically – ill Patients; Critical Care Unit.*

## Introduction

The nursing care for critically ill patients includes the implementation of basic care tasks intended to enable patients to perform daily life activities as well as advanced care tasks that support health recovery or the maintenance of clinical conditions. Patients who are hospitalized in critical care settings require nursing care to meet their basic needs. These interventions are integrated as indicators of patient outcomes and quality of care in critical care units [1] . The care that critically ill patients received at the end of life in critical care units is highly dependent on critical care nurse's knowledge and skills [2]. Attributes required to practice include advanced knowledge, critical thinking, advanced problem solving, leadership, advocacy and judgment [3]. The most of patients in the critical care unit are usually on mechanical ventilation and are not oriented properly or they are comatose. Therefore, providing care to patients in intensive care units requires an empowered nursing workforce who is equipped with contemporary knowledge, vigilance and expertise [4] . A Critical Care Nurse is one of the roles of a broader group of nurses called Clinical Specialists. Also called Critical Care Registered Nurse and Intensive care nurses, the exact term used will depend on area of specialization and

training. Although the scope of practice for a CCN varies by state as defined by the state board of nursing, a critical care nurse most commonly provides evidence based nursing care to deliver advanced care in intensive care, critical care and coronary care units [5]. The nurses should understand that the unique physiological, psychological, and emotional problems that arise in critically ill patients require a delicate balance between the scientific, technical, and humane components of nursing care [6]. Within this context of intensive care, the nursing contribution involves meticulous observation and skilled intervention, the provision of basic hygiene, nutrition and prevention of harm, as well as the provision of emotional and psychological support to both the patient and their families [7].

## Methodology

A quasi- experimental design was used to achieve the aims of this study, with the application of pre and post-test approach for both study and control groups. This study applied in Misan governorate hospitals in critical care units at Shaheed Al - Sadder teaching hospital and Al Zahrawi surgical hospital and started from the 29th of June 2018 to the 30th of October 2019. A non-probability (purposive) sample consisted of ( 60 ) nurses have been selected to obtain representative and accurate data. The size of sample was divided into two groups randomly, each one consisted of (30) nurses as the study group was exposed to an educational program while the control group was not exposed. The study instrument was adopted and developed by the researcher to evaluate the nurses' knowledge and practices concerning nursing care for critically – ill patients, it consisted of three parts: First part. Self-administered questionnaire sheet related to socio-demographic characteristics of the nurses consisted of (7) variables, which included name of hospital, age, gender, achievement education, years of experience in nursing , and years of experience in the critical care unit and training sessions. Second part: questionnaire sheet is assessment nurses' knowledge, it was composed of (43) questions in four domains(general information about intensive care nursing consisted of (4) items, Standard measurements for infection control in the critical care units consisted of (6) items, nursing care for critically – ill patients undergoing mechanical ventilation consisted of (20) items, and medications and solutions used in intensive care unit consisted of (13) items). Each question comprised of (4) alternatives for multiple choice. The questions were scored as correct (1) point and incorrect (0) point. Scores of response are categorized according to the following : Poor knowledge = (> 0.33): 1; Fair knowledge = (0.33-0.66):2; Good knowledge = (0.67-1.00):3.

Third part: questionnaire sheet checklist to evaluate nurses' was composed of (74) items divided into three domains (one domain:(7) items nurses' practices related ethical and legal considerations in the intensive care unit, two domain: (10) items related to the Standard precautions for infection control in the critical care unit, and three domain:(57) items related to nursing care for patients undergoing mechanical ventilation is in accordance with body systems and divided in eight subdomains nursing care for the following :( respiratory system (18) items, cardiovascular system (6) items, nervous system (5) items, digestive system (5) items, urinary system (6) items, skin and avoid the occurrence of bed ulcers(7) items, musculoskeletal system (4) items, and Psychosocial (6) items). These items were rated according to the Likers' scale; always (3) ; sometimes (2); and never (1).

## Results

**Table (1): Overall Evaluation of Nurses' Knowledge Concerning Nursing Care For Critically – ill Patients in the Study and Control Group at Pre and Post Test**

| Periods | Levels of Evaluation | Study Group | | Control Group | |
|---|---|---|---|---|---|
| | | Freq. | Percent | Freq. | Percent |
| Pre-test for Nurses' Knowledge | Poor ( 0 - 0.33 ) : 1 | 4 | 13.3 | 6 | 20.0 |
| | Fair ( 0.34 – 0.67 ) : 2 | 26 | 86.7 | 24 | 80.0 |
| | Good (0.68 – 1.00) : 3 | 0 | 0 | 0 | 0 |
| | Total | 30 | 100.0 | 30 | 100.0 |
| | $\bar{x} \mp S.D.$ | 0.45 ∓ 0.081∓ 0.081 | | 0.42 ∓ ∓ 0.074 | |
| Post-test for Nurses' Knowledge | Poor ( 0 - 0.33 ) : 1 | 0 | 0 | 7 | 23.3 |
| | Fair ( 0.34 – 0.67 ) : 2 | 0 | 0 | 23 | 76.7 |
| | Good (0.68 – 1.00) : 3 | 30 | 100.0 | 0 | 0 |
| | Total | 30 | 100.0 | 30 | 100.0 |
| | $\bar{x} \mp S.D$ | 0.83 ∓∓ 0.066 | | 0.42 ∓∓ 0.079 | |

**$\bar{x} \mp S.D.\bar{x} \mp S.D.$=Arithmetic Mean ($\bar{x}$)$\bar{x}$) and Std. Dev. (S.D.) .**

**Table (2): Overall Evaluation of Nurses' Practices Concerning Nursing Care For Critically – ill Patients in the Study and Control Group at Pre and Post Test**

| Periods | Levels of Evaluation | Study Group | | Control Group | |
|---|---|---|---|---|---|
| | | Freq. | Percent | Freq. | Percent |
| Pre-test for Nurses' Practices | Inadequate ( 1 - 1.66 ) : 1 | 0 | 0.0 | 0 | 0.0 |
| | Fair ( 1.67 – 2.33 ) : 2 | 30 | 100.0 | 30 | 100.0 |
| | Adequate (2.34 – 3.00) : 3 | 0 | 0.0 | 0 | 0.0 |
| | Total | 30 | 100.0 | 30 | 100.0 |
| | $\bar{x} \mp S.D.$ | 1.86 ∓ 0.082∓ 0.082 | | 1.85 ∓ ∓ 0.082 | |
| Post-test for Nurses' Practices | Inadequate ( 1 - 1.66 ) : 1 | 0 | 0.0 | 0 | 0.0 |
| | Fair ( 1.67 – 2.33 ) : 2 | 1 | 3.3 | 30 | 100.0 |
| | Adequate (2.34 – 3.00) : 3 | 29 | 96.7 | 0 | 0 |
| | Total | 30 | 100.0 | 30 | 100.0 |
| | $\bar{x} \mp S.D$ | 2.62 ∓∓ 0.185 | | 1.84 ∓∓ 0.073 | |

**$\bar{x} \mp S.D.\bar{x} \mp S.D.$=Arithmetic Mean ($\bar{x}$)$\bar{x}$) and Std. Dev. (S.D.) .**

**Table (3): Distribution of Nurses' Responses and comparisons significant Between Study and Control Groups at ( Pre and Post-Test ) Related to Main Domains of the Nurses' Knowledge Concerning Nursing Care For Critically – ill Patients**

| Main Domains Related to Nurses' Knowledge in Intensive Care units | Groups / Response | Study Group | | | | | | | Control Group | | | | | | | C.S. (*) Pre X Pre (C X S) | (*) C.S.. Post X Post (C X S) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pre-Test | | | Post-Test | | | C.S. | Pre-Test | | | Post-Test | | | C.S. | | |
| | | No. | % | M.S. | No. | % | M.S. | | No. | % | M.S. | No. | % | M.S. | | | |
| One : General Information About Intensive Care Nursing | Correct | 56 | 46.7 | 0.47F | 102 | 85.0 | 0.85G | P= 0.000HS | 55 | 45.8 | 0.46 F | 61 | 50.8 | 0.51 F | P=0.441 NS | P=0.898 NS | P=0.000 HS |
| | Incorrect | 64 | 53.3 | | 18 | 15.0 | | | 65 | 54.2 | | 59 | 49.2 | | | | |
| Two: Standard Measurements for Infection Control in the Critical Care Unit | Correct | 80 | 44.4 | 0.44F | 168 | 93.3 | 0.93G | P= 0.000HS | 104 | 57.8 | 0.58 F | 108 | 60.0 | 0.60 F | P=0.667NS | P=0.111 NS | P=0.000 HS |
| | Incorrect | 100 | 55.6 | | 12 | 6.7 | | | 76 | 42.2 | | 72 | 40.0 | | | | |
| Three: Nursing care for critically – ill patients undergoing Mechanical Ventilation | Correct | 258 | 43.0 | 0.43F | 486 | 81.0 | 0.81G | P=0.000HS | 228 | 38.0 | 0.38 F | 229 | 38.2 | 0.38 F | P=0.951NS | P=0.177 NS | P=0.000 HS |
| | Incorrect | 342 | 57.0 | | 114 | 19.0 | | | 372 | 62.0 | | 371 | 61.8 | | | | |
| Four: Medications and solutions used in the Critical Care Unit | Correct | 180 | 46.2 | 0.46F | 317 | 81.3 | 0.81G | P=0.000HS | 149 | 38.2 | 0.38 F | 142 | 36.4 | 0.36 F | P=0.595NS | P=0.055 NS | P=0.000 HS |
| | Incorrect | 210 | 53.8 | | 73 | 18.7 | | | 241 | 61.8 | | 248 | 63.6 | | | | |
| | Correct | 574 | 44.5 | 0.45 F | 1073 | 83.2 | 0.83 G | P=0.000 HS | 536 | 41.6 | 0.42 F | 540 | 41.9 | 0.42 F | P=0.868NS | P=0.131 NS | P=0.000 HS |
| | Incorrect | 716 | 55.5 | | 217 | 16.8 | | | 754 | 58.4 | | 750 | 58.1 | | | | |

**F: Frequencies, %: Percentages; M.S.: Mean of Score; C.S.: Comparison Significant, P:Probabiliy value; Level of Assessment= Poor (0 - 0.33 ) : 1; Fair ( 0.34 – 0.67 ) : 2; Good (0.68 – 1.00) : 3; N.S: Non Significant at ( P> 0.05); HS: High Significant at ( P< 0.01).**

**Table (4): Distribution of Descriptive Statistics of the studied groups according to ( Main Domains Related to Nurses' Practices for Nursing Care) with comparisons significant Between Pre-Test and Post-Tests in Both Groups**

| Main Domains Related to Nurses' Practices in Intensive Care Nursing | Groups / Response | Study Group | | | | | | | Control Group | | | | | | | C.S. (*) Pre X Pre (C X S) | C.S. (*) Post X Post (C X S) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pre-Test | | | Post-Test | | | C.S. | Pre-Test | | | Post-Test | | | C.S. | | |
| | | No. | % | M.S. | No. | % | M.S. | | No. | % | M.S. | No. | % | M.S. | | | |
| One: Ethical and legal considerations in the ICU | Always | 16 | 7.6 | 1.89 F | 188 | 89.5 | 2.89 A | P=0.000 HS | 14 | 6.7 | 1.84 F | 13 | 6.2 | 1.85 F | P=0.806 NS | P=0.294 NS | P=0.000 HS |
| | Sometimes | 155 | 73.8 | | 20 | 9.5 | | | 148 | 70.5 | | 152 | 72.4 | | | | |
| | Never | 39 | 18.6 | | 2 | 1.0 | | | 48 | 22.8 | | 45 | 21.4 | | | | |
| Two: Standard precautions for infection control in the CCU | Always | 18 | 6.0 | 1.85 F | 192 | 64.0 | 2.57 A | P=0.000 HS | 15 | 5.0 | 1.81 F | 12 | 4.0 | 1.82 F | P=0.706 NS | P=0.329 NS | P=0.000 HS |
| | Sometimes | 219 | 73.0 | | 87 | 29.0 | | | 213 | 71.0 | | 223 | 74.3 | | | | |
| | Never | 63 | 21.0 | | 21 | 7.0 | | | 72 | 24.0 | | 65 | 21.7 | | | | |
| Three: Nursing care for patients undergoing Ventilator is in accordance body systems | Always | 127 | 7.4 | 1.84 F | 1141 | 66.7 | 2.60 A | P=0.000 HS | 171 | 10.0 | 1.85 F | 141 | 8.2 | 1.84 F | P=0.503 NS | P=0.803 NS | P=0.000 HS |
| | Sometimes | 1189 | 69.6 | | 450 | 26.3 | | | 1115 | 65.2 | | 1150 | 67.3 | | | | |
| | Never | 394 | 23.0 | | 119 | 7.0 | | | 424 | 24.8 | | 419 | 24.5 | | | | |
| Total of Overall Domains Related to Nurses' Practice | Always | 161 | 7.3 | 1.86 F | 1521 | 68.5 | 2.62 A | P=0.000 HS | 200 | 9.0 | 1.85 F | 166 | 7.5 | 1.84 F | P=0.507 NS | P=0.641 NS | P=0.000 HS |
| | Sometimes | 1563 | 70.4 | | 557 | 25.1 | | | 1476 | 66.5 | | 1525 | 68.7 | | | | |
| | Never | 496 | 22.3 | | 142 | 6.4 | | | 544 | 24.5 | | 541 | 23.8 | | | | |

**F: Frequencies, %:Percentages, M.S.: Mean of Score; Level of Evaluation = Inadequate (1 - 1.66 ) : 1; Fair ( 1.67 – 2.33 ) : 2; Adequate (2.34 – 3.00) : 3; C.S.: Comparison Significant; NS: Non Significant at ( P > 0.05); S: Significant at ( P < 0.05); HS: High Significant at ( P< 0.01). C X S: Testing coincidence between Control and Study groups.**

**Table (5): Association Between Effectiveness of an Educational Program on Nurses' Knowledge with Their Demographic Variables.**

| Nurses' Knowledge Variables | Pre- Test | | | | Post –Test | | | |
|---|---|---|---|---|---|---|---|---|
| | Chi-Square | d.f | p-value | Sig. | Chi- Square | d.f | p-value | Sig. |
| Age | 1.319 | 4 | 0.858 | NS | 1.348 | 4 | 0.853 | NS |
| Gender | 0.009 | 1 | 0.925 | NS | 0.069 | 1 | 0.793 | NS |
| Achievement Education | 5.009 | 2 | 0.083 | NS | 19.260 | 2 | 0.000 | HS |
| Experiences Years in Nursing Field | 0.851 | 3 | 0.837 | NS | 5.600 | 3 | 0.133 | NS |
| Experiences Years in ICU | 2.190 | 4 | 0.701 | NS | 11.456 | 4 | 0.022 | S |
| Participation in Training Courses | 4.039 | 5 | 0.544 | NS | 2.012 | 5 | 0.848 | NS |

**d.f = degree of freedom, P = probability value, Sig.= Significant, S= Significant at( P< 0.05), HS= High**

**Significant at ( P< 0.01), NS= Non Significant at (P > 0.05).**

Regarding the nurses' practices regarding eye care in critically ill patients, it was found that nurses' practices scores were unsatisfactory [15]. The nurses' practices regarding body fluid balance assessment through observational checklist it revealed that percentage of satisfactory practice improved post structured educational program [16] . Finding of table-5- reveals that all nurses in both groups at pre-test period had same evaluation level for the nurses' practices, and also in the post test to the control group are accounted mean score (1.86); (1.85) & (1.84) respectively were have fair level, while post test to the study group is accounted mean score (2.62). Also results is showed, there are high significant differences( between pre and post tests of study group, and as well as post- test between study and control group) in all domains for nurses' knowledge related to nursing care for critically –ill patients. while shows that there are no significant differences between (pre and post-tests of control group, and pre-test between study and control group).. The study showed that, there was highly statistically significant relation between total nurses' knowledge score and practices level regarding pre and post program implementation, this means that when knowledge increased, the competent nursing practice increased [17].

## Conclusions

Illustrated from this study not all intensive care unit nurses were trained adequately on the nursing care guide in the intensive care unit approved by the Iraqi Ministry of Health which was prepared by Hammam Mithaq, ( 2017). The findings of the present study show that nurses' knowledge and practices were in moderate level at pre test regarding the nursing care for critically – ill patients at critical care units in Misan governorate hospitals.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

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# Genotyping Tinea Capitis Fungi based on Barcoding ITS rDNA Marker

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## Abstract

The study included isolating and diagnosing of Tinea capitis fungi isolated from clinical samples who are visited the outpatient clinics in Babylon / Hilla province. 50 samples were collected 40 clinical samples (hairs and scales), and 10 hair samples as control group. The results showed that: numbers of dermatophytes fungi were identified based on microscopic and Molecular criteria. *T. mentagrophytes, T. tonsurans, M. audounii, M. canis*. . Also two yeast species were identified: *Candida albicans, Candida parapsilosis*.

***Key words:*** *Tinea capitis, Genotypes, ITS rDNA.*

## Introduction

Tinea capitis is a scalp skin-attacking disease that attacks hair follicles and shafts , also causes eyebrow and eyelashes infection. The disease is regarded a shallow mycosis or dermatophytosis form. Several synonyms, including scalp ringworm and tinea tonsurans, are used [1]. The disease possess a health risk due to its ability to change patterns and high prevalence among children after pyoderma [2]. Poor economic and social status and poor hygiene are all associated with infection, in addition there are three factors that help to increase the disease: moving from pets to the house, early identification of suspected pests, incubation period of weeks is infectious but asymptomatic [3]. The aim of study conduct molecular typing of suspected fungi were associated with Tinea capitis samples, and those isolated from patients who are visited the outpatient clinics.

## Material and Method

**Collection of Specimens:**

A 40 hair and scalps samples were collected in this study from all patients diagnosed with head lesions (outpatient clinics). After that, the infected area was sterilized with 70% alcohol to remove the bacteria. Hair samples were collected using forceps and skin scraps from the scaly edge of the area using a surgical blade. The sample was transferred to the laboratory in sterile filter paper.

**Cultivation of Samples:**

All clinical samples collected were cultured on SDA agar media that containing chloramphenicol (250mg/l), Streptomycin (150mg/l) and cyclohexomide (250mg/l) then all samples incubated at (28-30°C) for two weeks. Then after the result of culture appeared the samples were examined morphologically from where the color of colony, shape, texture and reverse pigment. Then maintained the samples by using a screw-cup slant on SDA and preserved during the study [4].

All samples that give positive results of Tinea capitis purified by taking a pure colony from culture media that obtain a mixed culture.

**DNA extraction:**

The isolates of yeast and filamentous fungi under interest were subjected to DNA extraction. In brief; a loop full of yeast colonies and tiny portion of mycelia

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were suspended in the lysis buffer supplemented by Promega Yeast Extraction Kit (USA) and following up the extraction steps based on the instruction of this Kit. A dry DNA pellet dissolved in diluted rinse and preserved in - 20 °C until use [5-8].

The genomic DNA was extracted according to Imran and Al.Shukry (2014); The PCR procedure was as previously described by [5-7].The universal primer pair used in this study was ITS5/ITS4 Forward: (5′-GGAAGTAAAAGTCGTAACAAGG-3′) and Reverse (5′-TCCTCCGCTTATTGATATGC-3).

**Sequencing of Selected PCR Product**

A 10 dermatophyte isolates PCR products were sent to Korea's Macrogen Laboratory and obtained the positive sequence information for various species. The sequencing findings were subjected to multiple sequence alignment with reference strains deposits in GenBank for identification.

## Results and Discussion

**Prevalence of dermatophytes among Tinea capitis sufferers:**

A total of 50 samples, 40 samples (hairs and scales ) were collected from different age and genders of patients with Tinea capitis and 10 samples were collected by the same techniques from likely healthy persons (as control samples), the clinical specimens were collected from private clinics in Babylon province. Identification results based on cultural and microscopic methods showed that 35 (87.5%) of 40 clinical samples were positive cases. The majority of the patients were males 57.14 % (20/ 40) while, 42.85 % (15/40) specimen from females. While only one specimen shown positive out of 10 samples from control group.

**The relations between the infection and age for both genders:**

It had been registered the number and percentage of infected patients by Tinea capitis , depending on gender and age ,table (1) had shown the significant difference between genders and infection with this disease , the number of males (20)( 57.14%) and the number of females reached (15)( 42.85%) to the consultative of the dermatology .

It was clear from the current study, males infection with Tinea capitis was (57.14%) while in females (42.85%) it was found existence of significant differences of the infection in both sexes agreed with results of other researchers outside of Iraq, including Sehagal *et al*.,(1985) in the city of New Delhi, India, Ayaya *et al*.,(2001) in Kenya ,and Ali-Shtayeh,(2002) in Palestine and Morar *et al*.,(2004) in South Africa , Wani *et al*.,(2006) in Kashmir, who found that Tinea capitis affects males more than females in their studies.

**Table (1) Distribution of age and gender among patients of Tinea capitis.**

| Age/year | Gender | | | | Total Infection | |
|---|---|---|---|---|---|---|
| | Male | | Female | | | |
| | Number | percentage | Number | percentage | Number | percentage |
| 1 – 10 | 16 | 45.71% | 14 | 27.08% | 30 | 85.71% |
| 11 – 20 | 3 | 8.57% | 0 | 0% | 3 | 8.57% |
| 21 - 30 | 1 | 2.85% | 0 | 4.16% | 1 | 2.85% |
| 31 – 40 | 0 | 0% | 1 | 2.85% | 1 | 2.85% |
| Total | 20 | 57.14% | 15 | 42.85% | 35 | 100% |

Phenomenon of wearing veil by female may help in the reduction of the infection and transmission. This result was approached with reached Ali, (1990), who had the highest infection rate among people aged between (5-10) years, and by Abbas (1995), the highest infection rate among people aged 6-9 years.

**The Identified fungi:**

A total of 6 fungal isolates have currently been identified based on evidence of morphological, microscopic, and molecular analysis. The dermatophytes were: *T. mentagrophytes, T. quinckeanum, T. tonsurans, M. audonii, M. persicolor, and M. canis.* Also, two *Candida* spp. were *C. albicans, C. parapsilosis.*

**Table (2): Fungal isolates from hair infected with Tinea capitis.**

| **Fungal isolates** | **No. of isolate ii i isolates** | **Percentage of frequency** | **Males (%)** | **Females (%)** |
|---|---|---|---|---|
| M. audounii | 19 | 54.28% | 10(28.57%) | 9(25.71) |
| M. canis | 2 | 5.71% | 2(5.71%) | 0(0%) |
| M. persicolor | 9 | 25.71% | 4(11.42%) | 5(14.28%) |
| T.mentegrophytes mentagrophytes mentagrophytes mentagrophytes mentagrophytes mentagrophytes | 1 | 2.85% | 1(2.85%) | 0(0%) |
| T. quinckeanum | 1 | 2.85% | 0(0%) | 1(2.85%) |
| T. tonsurans | 3 | 8.57% | 3(8.57%) | 0(0%) |
| Total | 35 | 100% | 20 (57.14%) | 15(42.85%) |

Table 2 shows the types of dermatophytes isolated from the human, the most common isolate predominant was *M. audonii which* represent 19 (54.28%) of cases followed by *M. persicolor* 9 (25.71%). It showed the presence of differences between sex and species of the fungi isolated.

**Molecular identification**

The results genotyping of 12 dermatophytes under interest based on the rDNA region ITS1-5.8S-ITS2, 28S partial sequence shown deferent genotypes. The dermatophytes were: *Microsporum* spp*; Trichophyton* spp. shown in Figure (1).

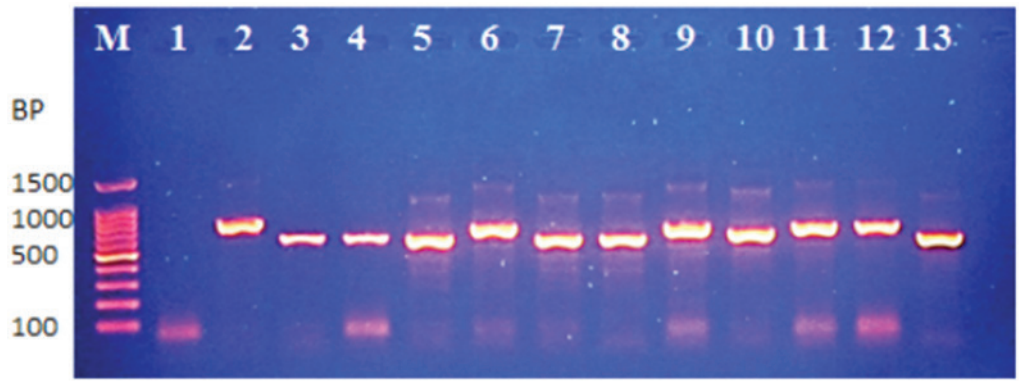


**Figure (1): Profile gel electrophoresis of PCR products of 12 dermatophyte isolates of fungi amplified by ITS5/ITS4 primer: Lanes (left to right): isolate of 1- negative control; 2-,***M. audouinii* **(800 bp and; 3-5** *T. mentagrophytes***(780 bp ); 6-** *Candida*

***parapsilosis* (600bp) [9] ; 7 - 9** *T. queckanum* **(700 bp) ; 10-11 -** *T. tonsurans* **( 700 bp ) ; 12 -** *M. persicolor* **( 700 bp ), these results according to sequence analysis ; 13 -** *Candida albicans* **(500 bp ) [9] ; Molecular M (100bp for each step.). 1.6% agarose gel at 70 volt for one hour.**

There are high variations in PCR products among of fungi under interest as in used ITS5 / ITS4 as primer pair for amplification of ITS1-5.8S-ITS2, 28S region with primers flanking region, consider good barcoding region due to high variation for another ward the amplification of this region show high polymorphism in PCR product. (*M. audouinii, M. canis, M. persicolor, T. mentagrophytes, T. queckanum, T. tonsurans*) these range not always require for other specific genetic analysis. [9]

**DNA sequence analysis:**

About16 µl of PCR products were sent to Macrogen Laboratory in Korea for sequencing analysis. After the sequence results had been obtained, each sequence alignment with the sent isolate's nitrogen bases sequence. They correspond to reference sequencing samples in the gene bank using NCBI Blast Nucleotide.

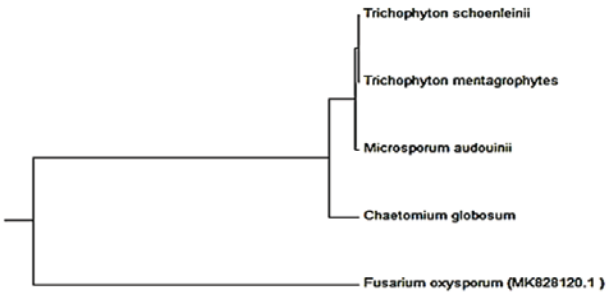


**Figure (3): Phylogeny construction for all identified isolates based on sequence charts with one reference strain (marked with the accession number, while our isolates have full names).**

## Conclusion

Conclusion of this study gave attention that particular study about Tinea capitis more producible in their result compared with survey studies of dermatophytes fungi in whole human body.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Ministry of Health and all experiments were carried out in accordance with approved guidelines.

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# Encrypt Medical Image using CSalsa20 Stream Algorithm

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**Abstract**

As a result of the tremendous development in the field of information technology and the internet and exposure to a flood of violations to circumvent and steal information organized and unorganized. The urgent need for the emergence of data protection technologies and data encryption techniques. As a result of the tremendous development in the field of information technology and the internet and exposure to a flood of violations to circumvent and steal information organized and unorganized. The urgent need for the emergence of data protection technologies and data encryption techniques one of these methods, The Salsa20 encryption stream and all of its reduced versions Salsa20 / 7 and Salsa20 / 12 are among the fastest stream ciphers today. In this paper, the Salsa20 method is therefore improved by adding a new variable by using chaos theory which can achieve faster propagation than the original Salsa20 and has been applied by encrypting medical images that need confidentiality because some patients do not want anyone to know about a disease so the patient's medical data is encrypted and no one can access it. This method has been tested and measured with the original Salsa20 with a series of tests. Most tests show that the proposed messy salsa is faster than the original salsa.

***Keywords***— *salsa20, medical image, chaotic map.*

## Introduction

In clinical computer systems, medical images are critical and sensitive information [1]. To transfer medical images through a nonsecurity network, a reliable encryption algorithm must be developed. Among the three main features of security services (CIA),the most important characteristics of the exchange between doctors of medical images are confidentiality [2]. It is important to protect the confidentiality of image data from unauthorized access in conjunction with the rapid development of electronic data exchange [3]. Violations of security can affect the privacy and reputation of users. Data encryption is therefore widely used in open networks such as the Internet to ensure security [4]. Due, to the, significant increase, in digital data transmission via public channels, digital image security has become more popular and attracting a great deal of attention in the modern digital world. Throughout our culture, the advancement of multimedia technology has enabled digital images to play a greater role than conventional documents, which require serious privacy protection for all applications [5]. Each data type has its own advantages, so different techniques must be used to protect confidential image data from unauthorized access. Most, available, encryption algorithms use text data. Nevertheless, it is not feasible to use traditional methods of encryption due to the large data volume and real-time requirements. The last major trend is therefore to reduce the computational requirements for stable multimedia distribution [6]. Several authors have suggested various image coding schemes to overcome problems with image coding [7]. A classification of the schemes proposed in open literature is provided in [8]. In this paper, we, scanned the image encryption application for Salsa 20. Salsa20 has an interesting complete structure that appears to be a good choice for encoding images. A series of tests were used to justify the visual coding efficiency of Salsa20

**Salsa20 Algorithm**

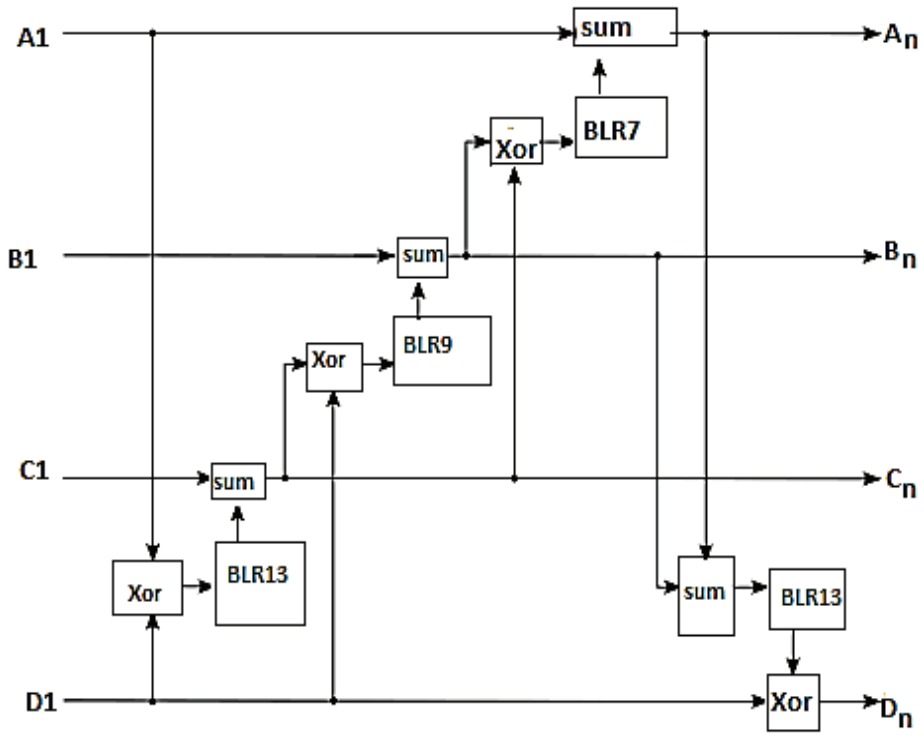


**Figure (1) salsa20 work**

**Salsa 20 is a stream cipher designed depend on rotation operations 32-bit addition, and adding 32-bit bitwise (XOR). The salsa algorithm assigns block size 4 X4 to consist of a key (256-bit), nonce (64-bit), position (64-bit), and four output key constant from (32 to 512) bits. The Salsa20 core is a hash function for 64-byte input and 64-byte output that is stream cipher that works in counter mode. The producer of the 64-byte keystream through hash key, block, nonce, and the results are XOR operation with 64-byte plaintext. The Salsa20 hash function indicates a quarter function. In the figure (1), shown the method Salsa20 works, where you perform several operations that will be explained later. Where this method is implemented on the image and to implement it will need several stages first generating the key using the method of Salsa and encrypt the image through it.**

### Salsa20 operation

Salsa20 algorithm includes several processes the functions offered in order from lower-level to a higher level that is more complexity:

### 1.Summation between Two words

Add four byte words are indicated through of $a + b$ algorithm and divided result into a parameter of $2^{32}$ (thus, can be stored that the maximum value that in a single word). The summation of the words $a$ and $b$ is equal $((a + b) \bmod 2^{32})$. $((a + b) \bmod 2^{32})$. The result is a valid word of 4 bytes long.

### 2.Xor Operation between Two Words

Xor Operation is referred to for two words of 4 bytes in the description of the methods as *a XOR b*. To perform an XOR add-in, comparison *bit by bit* between two words, and the addition of XOR is executed for each pair. The consequence is an accepted word length of 4 bytes.

### 3.Binary Left Rotation

Left bit rotation of the word 4-byte wrd is indicated in the algorithm as ***wrd <<< at***. Move left-most to the positions rightmost. The rotation of the bits to the left can be represented by a word of 4 bytes in the form of multiplication: $(\mathbf{2^{at} \cdot wrd \bmod (2^{32}-1)})$. The results are an accepted word 4-byte long.

**4.Function of Quarter Round**

In this method take four words for input and return other string of four words.

If v is a four words input:

$v = (v_0, v_1, v_2, v_3)$

The function can be defined as:

Quarter (v) = $(u_0, u_1, u_2, u_3)$

Where:

$u_1 = v_1$ Xor $((v_0 + v_3) <<< 7)$

$u_2 = v_2$ Xor $((u_1 + v_0) <<< 9)$

$u_3 = v_3$ Xor $((u_2 + u_1) <<< 13)$

$u_0 = v_0$ Xor $((u_3 + u_2) <<< 18)$

Quarter functionality may be implemented, without having to allocate any Extra memory. First, u1 alteration to v1, then u2 alteration to v2, the next u3 alteration to v3, and u0 alteration to v0. This method is reversed cause of the above adjustments are reversible.

**5.Function of Row Round**

This method takes input 16 words and convert it and return a 16-word string. The method similar to the column round function but doing different order of words.

If u input 16-word:

$u = (u_0, u_1, u_2, ..., u_{15})$

The method can be defined as:

Row round (u) = $(v_0, v_1, v_2, ..., v_{15})$

Where:

$(v_0, v_1, v_2, v_3)$ = Quarterly $(u_0, u_1, u_2, u_3)$

$(v_5, v_6, v_7, v_4)$ = Quarterly $(u_5, u_6, u_7, u_4)$

$(v_{10}, v_{11}, v_8, v_9)$ = Quarterly $(u_{10}, u_{11}, u_8, u_9)$

$(v_{15}, v_{12}, v_{13}, v_{14})$ = Quarterly $(u_{15}, u_{12}, u_{13}, u_{14})$

The square matrix displayed 16-word inputs:

| | | | |
|---|---|---|---|
| $u_0$ | $u_1$ | $u_2$ | $u_3$ |
| $u_4$ | $u_5$ | $u_6$ | $u_7$ |
| $u_8$ | $u_9$ | $u_{10}$ | $u_{11}$ |
| $u_{12}$ | $u_{13}$ | $u_{14}$ | $u_{15}$ |

in the array, the Rows may be alteration at the same time. Each of them is changed through the Quarter round function.

The first row, the word is alteration order as follow:

$u_1, u_2, u_3, u_0$

The second row, the word is alteration order as follow:

$u_6, u_7, u_4, u_5$

The third row, the word is adjusted in the order:

$u_{11}, u_8, u_9, u_{10}$

Finally, words are altered in order in the last and fourth rows:

$u_{12}, u_{13}, u_{14}, u_5$.

**6.Function of Column round**

This method takes input 16 words and returns the sequence of 16-word. The method similar to the Row round function but doing different order If u is the input of 16-word:

$u = (u_0, u_1, u_2, ..., u_{15})$

The method may be defined as follows:

Column (u) = $(u_0, u_1, u_2, ..., u_{15})$

Where:

$(v_0, v_4, v_8, v_{12})$ = Quarterly $(u_0, u_4, u_8, u_{12})$

$(v_5, v_9, v_{13}, v_1)$ = Quarterly $(u_5, u_9, u_{13}, u_1)$

$(v_{10}, v_{14}, v_2, v_6)$ = Quarterly $(u_{10}, u_{14}, u_2, u_6)$

$(v_{15}, v_3, v_7, v_{11})$ = Quarterly $(u_{15}, u_3, u_7, u_{11})$

The square matrix displayed 16-word inputs:

| | | | |
|---|---|---|---|
| $u_0$ | $u_1$ | $u_2$ | $u_3$ |
| $u_4$ | $u_5$ | $u_6$ | $u_7$ |
| $u_8$ | $u_9$ | $u_{10}$ | $u_{11}$ |
| $u_{12}$ | $u_{13}$ | $u_{14}$ | $u_{15}$ |

in the array, Columns may be alteration at the same time. Each of them is changed through the Quarter round function.

The first column, the word is alteration order as follow:

$u_4$, $u_8$, $u_{12}$, $u_0$

The second column, the word is alteration order as follow:

$u_9$, $u_{13}$, $u_1$, and $u_5$

The third column, the word is alteration in order:

$u_{14}$, $u_2$, $u_6$, $u_{10}$

The last four columns, the word is alteration in order:

$u_3$, $u_7$, $u_{11}$, $u_{15}$

**7.Function of Double Round**

This method input 16 words and returns the sequence of 16-word.

If x is input of 16-word, then the Function is defined as follow:

***double round (u) = row round (column round(u))***

**8.Function of Little Endian**

This method can be changed the sequence order is 4 bytes.

If bt is 4byte sequence:

$bt = (bt_0, bt_1, bt_2, bt_3)$

then the method definition as:

$$\text{little endian (bt)} = bt_0 + 28bt_1 + 216bt_2 + 224bt_3$$

The function of little-endian is reversible. It simply modified the word order of bytes.

**9.Function of Salsa20 Hash**

The Function of Salsa20 Hash takes input 64 bytes and returns the sequence of a 64-byte.

If the input is 64byte sequence

input = $(bt_0, bt_1, bt_2, ..., bt_{63})$ Then 16 words are created

$wd_0$ = little endian$(bt_0, bt_1, bt_2, bt_3)$

$wd_1$ = little endian$(bt_4, bt_5, bt_6, bt_7)$

[...]

$wd_{15}$ = little endian$(bt_{60}, bt_{61}, bt_{62}, bt_{63})$

$(u_0, u_1, ..., u_{15}) = \text{double round}^{10}(wd_0, wd_1, ..., wd_{15})$

$$\text{Output} = lE^{-1}(u0 + wd0) + lE^{-1}(u1 + wd1) + \ldots + lE^{-1}(u15 + wd15)$$

**10.Function of Salsa20 Expansion**

The Function of Salsa20 Expansion takes two bytes' sequences. The first sequence maybe 16 or 32 bytes and the second sequence (N) is 16 bytes long. The method returns a sequence other than 64 bytes. If 32-bytes long represent the first sequence, then divided 16 bytes of two shorter sequences ($T_0$ and $T_1$). The definition of function Salsa20 expansion by utilizing the function of the Salsa20 hash, as shown below:

Salsa20 Expansion $T_0$, $T_1$(N) = Salsa20 Hash ($at_0$, $T_0$, $at_1$, N, $at_2$, $T_1$, $at_3$)

where:

$at_0$ = (97,120,101,112), $at_1$ = (32,51,100, 110)

$at_2$ = (121, 98, 45, 50), $at_3$ = (101,107, 32,116)

If 16-bytes long (T) represent first sequence, then Function definition by utilizing the Function of Salsa20 Hash as below:

Salsa20 Expansion T(N) = Salsa20 Hash ($bt_0$, T, $bt_1$, N, $bt_2$, T, $bt_3$)

where:

$bt_0$ = (97,120,101,112), $bt_1$ = (32,49,100, 110)

$bt_2$ = (121, 98, 45, 54), $bt_3$ = (101,107, 32,116)

The vector of constant values ($at_0$, $at_1$, $at_2$, $at_3$) means32-byte T' expansion in ASCII code. Similarly, the second vector of constant values ($bt_0$, $bt_1$, $bt_2$, $bt_3$)

means 16-byte T' expansion in ASCII.

### 4. Chaotic Function and Logistic Map

Chaotic maps usually utilized in the investigation of dynamical frameworks [13]. Every now and again, Chaotic maps produce fractals. In spite of the fact that a rehashed procedure may develop the fractal, a few fractals are considered assets as opposed to regarding maps that produce them [14]. Thisais on theagrounds that there are many different iterative methods to generate a similar fractal. The logisticamap is a simple quadratic mathematical polynomial demonstrating complex chaoticabehavior. due to its simplicity, the logistic map remains useful as a testbed for new ideas in the theory of chaos and for the application of chaos in cryptography [15]. The basic form of the logisticamap can be mathematically interpreted, as shown in Eq. (1):

$$X_{n+1} = rx_n(1 - x_n)X_{n+1} = rx_n(1 - x_n) \quad \text{... (1)}$$

Where x is a stateavariableathat can, have any value between 0 and 1, and r is the system parameter that falls at the interval [1, 4]. Figure (2) shown the logistic map bifurcation diagram. The bifurcation variable r is shown on the plot's horizontal axis and the vertical axis displays the logistic function's possible long-term population values. Each of these bifurcation points is a bifurcation that doubles over time.

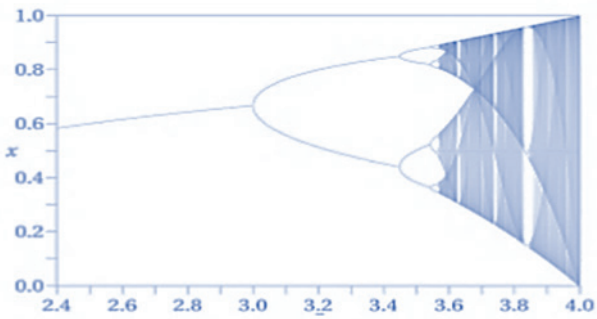


**Figure (2) Bifurcation diagram for the logistic map**

### 4. The Proposed Method of CSalsa20 algorithm

The proposed method consists of two main stages: - firstly, a random key is generated using the Salsa 20 algorithm with a logistic map secondly, encryption for the medical image after partition and return original image as shown in Figure (3).

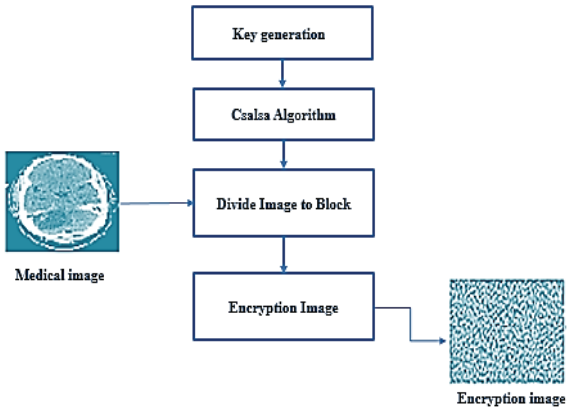


**Figure (3): Block diagram of Proposed Extraction Method**

A. Key generation CSalsa20 algorithm

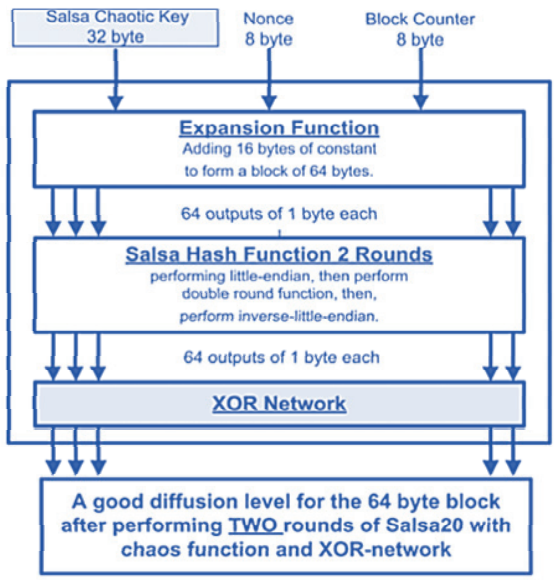


**Figure (4) System block diagram**

chaotic key generation can improve the resistance of Salsa20 against various attacks and help remove the statistical leakage that may be detected in the first rounds. The application of the chaotic logistics map to create the messy key will increase the input differences between any two successive periods from 1 bit to 33 bits because each block has four new bytes of clutter. These 33 new bits came from the 1-bit counter bit of the block, and the other new 32-bits come from the secret key's four chaotic bytes. Figure (5) illustrates how the chaotic key is produced. The first byte of the original key is the transformed integer within the [ 0, 255] range to the appropriate range for the logistic map, which falls within the [ 0, 1] range. The resulting float value is then fed as input to the logistic map. Because of its

speed, the logistic map was chosen because it has the minimum calculations needed to achieve the chaotic behaviour. The sequences of random numbers are generated. Each sequence depends on the Initial value and control parameter. The sequences are very sensitive to change of these two initial values. This consists of a series of 64-byte keys that are applied to the grayscale image after dividing this image into a set of blocks (8*8) where each block of the image takes 64 bytes of the key and then work on the rest of the block, but every time it is encrypted with a key, the current keys are combined with the previous using Xor so that the current key is more random and continue this process for all blocks.

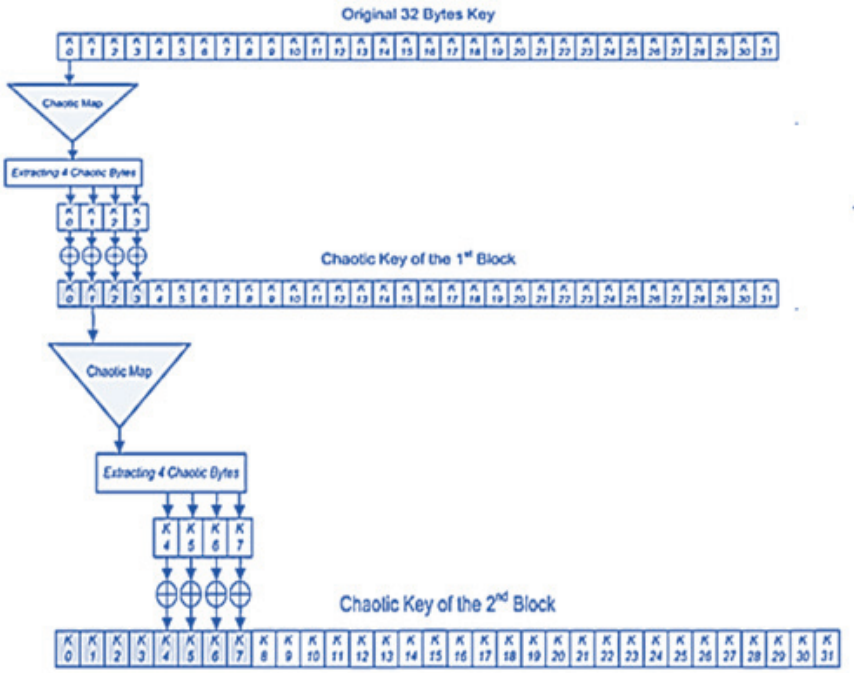


**Figure (5) key generation**

B. Encryption Medical Image

Generate a random block by a CSalsa20 algorithm these blocks important when need to retrieve the image because it depends on the number of blocks and its original image. After divided image to set of blocks where each block corresponds to 64 bytes of keys after that make XOR between the key and the image. The current keys are combined with the previous make Xor operation so that the current key is more random e XOR operation and this method continues to the last block exists in the image, so the result of encryption is very strong in this case because of the diffusion of this algorithm good.

## 4. Experimental Results

The experimental results of proposed methods. The three techniques are evaluated for finding the performance of them. The stream cipher used with the key generation from all techniques to test them.

### *1.Key Generation*

key generation mixed with Salsa Algorithm to generate a requested length of keys that used for encryption. The implementation of the Logistic Map Algorithm generates also sequence of numbers (32-bit number) as shown in Table (1). these numbers are real number when used logistic map multiplied by powered 10 number, rounded and modulated with $2^{32}$ to get exactly 32-bit number.

**Table (1) CSalsa number generator**

| Key generation of CSalsa20 | | | |
|---|---|---|---|
| 347892 | 424951 | 842773 | 786421 |
| 523986 | 723765 | 262307 | 734170 |
| 546233 | 345192 | 635897 | 544215 |
| 648901 | 631182 | 827878 | 831516 |
| 241792 | 440634 | 251371 | 239573 |
| 765231 | 586234 | 734682 | 684156 |
| 905569 | 872618 | 778436 | 856498 |
| 578456 | 582236 | 647712 | 574477 |
| 459458 | 814245 | 856919 | 948034 |
| 367238 | 204838 | 460448 | 382587 |
| 802299 | 680789 | 932983 | 961345 |
| 612988 | 424949 | 562136 | 782357 |

### *2.Encryption Various Medical Image*

An encryption image by the improvement of Salsa20 algorithm that used logistic map for generated keys. It may be clearly seen that there an emerging pattern in the medical image. However, encryption image by CSalsa20, there is no evidence of any leakage in the image. This is illustrated by the histogram calculation of the image before and after encryption as shown in Figure (6).

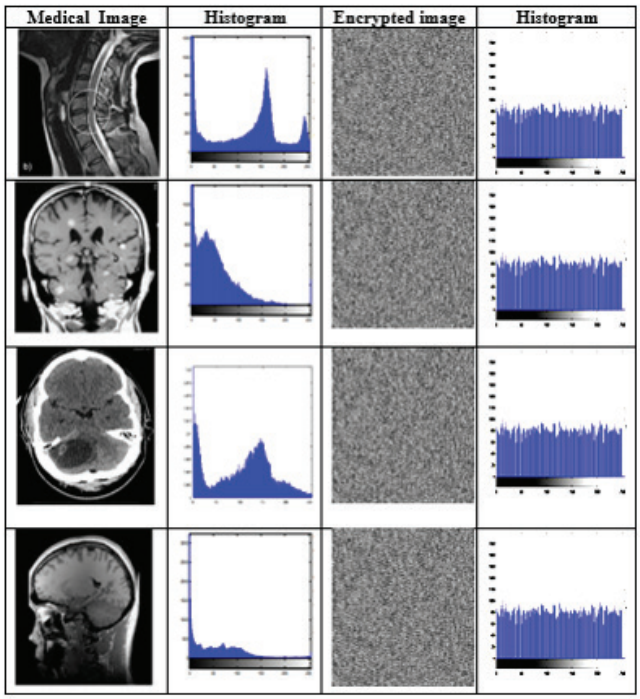


**Figure (6): the original tested images with histograms.**

## Conclusion

The suggested two-round chaotic salsa (CSalsa2) allows only two rounds of scrambling data to achieve a good rate of diffusion, making the cipher faster. A novel technique is introduced in this work to incorporate the chaotic logistic map into the Salsa20 algorithm. The XOR-network is utilized to addressatheastatisticalaleakage observed at the second round of Salsa20. The CSalsa2 proposed should reach a good diffusion rate faster than the original Salsa20, according to the speed measurements. Differential attacks infected the original reduced-round versions of Salsa20. At the inputs of any two Salsa20 sequential blocks, there is the only 1-bit difference. Moreover, the proposed chaotic Salsa model has 33-bits of variations. The widening of the input differences will reinforce the system against various types of attacks.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the University of information technology and communications and all experiments were carried out in accordance with approved guidelines.

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# Evaluation of Students' Self–management and Academic Achievement in the University of Baghdad

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## Abstract

**Objective(s):** To evaluate university students' self-management and academic achievement; to compare between these students relative to their self-management and academic achievement; and to determine the relationships between these students' self-management, academic achievement and their socio-demographic characteristics in the University of Baghdad. For the period of November 2nd 2018 to May 30th 2019.

**Methods:** A descriptive design, using the evaluation and comparison approaches, is employed throughout the study. Two self-evaluation questionnaires are constructed for the purpose of the presents study. Content validity and internal consistency reliability are determined for the study instruments through a pilot study. A non-probability, purposive sample, of (80) university students is selected from the Medical Colleges, College of Engineering, College of Sciences and College of Education in the University of Baghdad. Data are collected through the use of the study instruments and the structured interview technique as means for data collection for the period of February 21st 2019 to March 20th 2019. Data are analyzed through the application of the descriptive statistical data analysis approach which includes frequency, percentage, mean, total score and range and inferential statistical data analysis approach of Analysis of Variance and Multiple Linear Regression.

**Results:** The study depicts that most of the college students experience fair to good level of self-management and good level of academic achievement.

**Conclusion:** The study concludes that students do not present differences in their self-management and academic achievement. Self-management is affected by students' gender and education and academic achievement is influenced by students' socioeconomic status

***Key Words:*** *Evaluation, Comparison, Self-management, Academic Achievement, University of Baghdad.*

## Introduction

Self-management is a key assistant for all learning (for children and adults!) for both materials and academic courses, and other content areas, or skills. Self-management allows students to follow through plans to complete the tasks, and study of the tests, and continue to focus in the classroom. In adults, it is important that the objectives of access in the field of learning, such as the development of new professional skills [(1)]. Self-management helps students become successful learner. It refers to the strategies, techniques and methods that we use to guide the activities and behaviors effectively when it comes to the study, including self-management, setting goals, planning and time management. Self-management is an essential skill that will help them throughout their lives [(2)]. Students should be invited to the learning management process in the classroom. Here are some of the tools used by many teachers to enable students to self-management [(3)]. It found self-management techniques to be more effective in student behavior management interventions mediated by the teacher. When self-management strategies are related to behavioral interventions and equal Functionally, the students increased the amount of time in the job, and showed social behaviors more convenient, and completed more tasks. Self-management interventions for student self-monitoring include: notes both the students and records the target behaviors and self-assessment: It compares the performance / her with the

specified criteria and self-education student is directed oriented student behavior through the use of personal data and setting goals: Students set a target and create a personal commitment and guidance for progress towards this goal [(4)]. Academic achievement for students is the current level of student learning. More specifically, for the purposes of each student succeed in the accountability act (ESSA), academic achievement refers to the percentage of students in the school that meets their learning standards currently classroom level or beyond. This achievement is measured using tests at the state level in math and reading. Achievement is measured also by using assessments in the case of science, but will not be used scientific assessments of accountability under ESSA. Often measure the academic achievement of the students in terms of the semester or cumulative average point for graduates (GPA) or the number of courses or credit hours that have been completed [(5)]. Research concerned with the phenomenon of academic performance of students during the learning process based on the average score points (GPA). In this regard, students' ability to control the factors that affect the learning process, which is called academic self-management affected. A successful student is regarded as the one who is able to control the factors which influence their learning process. A study is conducted to verify the role of academic self-management in improving students' academic achievement. The quantitative methodology with a simple random sampling technique is employed. The total samples are (105) students of Padjadjaran University. The results show that (78%) of the subjects possessed high academic self-management, meaning that the majority of subjects used academic self-management to control factors which influence the learning process. The final model of academic self-management can be used in order to empower students to improve their academic achievement, so that they have capital to move forward and build their future (6). Based on the early stated evidence, the present study ought to evaluate students' self-management and academic achievement at Colleges in the University of Baghdad.

## Methodology

A descriptive design, using the evaluation and comparison approaches, is carried throughout the present study to evaluate colleges students' self–management and academic achievement; to compare between these students relative to their self-management and academic achievement; and to determine the relationships between these students' self-management, academic achievement and their socio-demographic characteristics in the University of Baghdad for the period of November 2nd 2018 to May 30th 2019. The study is conducted on students at Medical Colleges (Medicine, Dentistry, Pharmacy and Nursing), College of Engineering, College of Sciences, and Ibn Al-Rushud College of Education in the University of Baghdad. A "non-probability" purposive, sample of (80) university students, is selected. The sample is comprised of (20) students from Medical Colleges (Medicine, Dentistry, Pharmacy and Nursing), (20) students from College of Engineering, (20) students from College of Sciences, (20) students from Ibn Al-Rushud College of Education. It is consisted of (40) males and (40) females and (18-27) years old. Each student, who has participated in the present study, has signed a consent form for the agreement to be involved in the study and as prerequisite for the ethical consideration. Two questionnaires, Students' Self-management (21) items and Students' Academic Achievement (20) items, are constructed for the purpose of the study throughout review of relevant literature and consultation with a panel of experts. A pilot study is carried out from January 7th 2019 to February 20th 2019 to determine the internal consistency reliability and content validity of the study instruments. The internal consistency reliability of the questionnaires is determined through the use of split-half technique and the computation of Cronbach alpha correlation coefficient. A purposive sample of (20) student is gathered for the purpose of the reliability of the study instruments. The results indicate that the correlation coefficient is ($r = 0.87$) for the self-management questionnaire and ($r = 0.88$) questionnaire to the academic achievement questionnaire. Such scores reveal that the study instruments are adequately reliable measures for the concepts underlying the present study. Content validity of the study instruments is determined by panel of (12) experts. These experts are faculty members at the early mentioned colleges in the University of Baghdad. They are provided with copies of the questionnaires and asked to review and evaluate the study instruments for content clarity and adequacy. Their responses depict that the study instruments are valid measures for the phenomena underlying the study. Data are collected through the use

of the study instruments and the structured interview technique as means for data collection for the period of February 21st 2019 to March 20th 2019. Data is analyzed by applying descriptive statistical data analysis approach which includes the frequency, percentage, mean, total score and range and inferential statistical data analysis approach which includes analysis of variance and multiple linear regression.

## Results

**Table (1): Overall Evaluation of the Colleges Students' Self–management**

| List | Levels | Frequency and Percentage |
|---|---|---|
| 1 | Poor (21–34.33) | 4 (5%) |
| 2 | Fair (34.34–43.67) | 30 (37.5%) |
| 3 | Good (43.68–63) | 46 (57.5%) |

This table depicts that most of the college students have experienced good level of self-management (57.5%) but more than one third of them have experienced fair level of self-management (37.5%).

**Table (2): Overall Evaluation of the Colleges Students' Academic Achievement**

| List | Levels | Frequency and Percentage |
|---|---|---|
| 1 | Poor (20–22.33) | 0 (0.0 %) |
| 2 | Fair (22.34–34.67) | 0 (0.0 %) |
| 3 | Good (34.68–60) | 80 (100 %) |

This table depicts that all of the colleges' students have experienced good level of academic achievement (100%).

**Table (3): Analysis of Variance for the Comparison between Students Relative to Their**

Self-management

| Source of Variance | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| SMM | Between Groups | 1149.633 | 11 | 104.512 | 1.752 | 0.218 |
| | Within Groups | 477.167 | 8 | 59.646 | | |
| | Total | 1626.800 | 19 | | | |
| SME | Between Groups | 591.383 | 11 | 53.762 | 0.353 | 0.944 |
| | Within Groups | 1219.167 | 8 | 152.396 | | |
| | Total | 1810.550 | 19 | | | |

***Cont...*** **Table (3): Analysis of Variance for the Comparison between Students Relative to Their**

| | | | | | | |
|---|---|---|---|---|---|---|
| SMS | Between Groups | 846.833 | 11 | 76.985 | 0.657 | 0.746 |
| | Within Groups | 937.167 | 8 | 117.146 | | |
| | Total | 1784.000 | 19 | | | |
| SMEDUC | Between Groups | 495.667 | 11 | 45.061 | 0.506 | 0.854 |
| | Within Groups | 712.333 | 8 | 89.042 | | |
| | Total | 1208.000 | 19 | | | |

SMM= Self-management of Medical Students, SME= Self-management of Engineering Students, SMS= Self-management of Sciences Students, SMEDUC= Self-management of Education Students, df= Degree of Freedom, F= F- statistics, Sig.= Level of significance at $p \leq 0.05$

The results, from this table, reveal that there are no significant differences between self-management for students with regard to the type of total differences.

**Table (4): Analysis of Variance for the Comparison between Students Relative to Their Academic Achievement**

| **Source of Variance** | | **Sum of Squares** | **Df** | **Mean Square** | **F** | **Sig.** |
|---|---|---|---|---|---|---|
| AAM | Between Groups | 1150.050 | 18 | 63.892 | 0.354 | 0.890 |
| | Within Groups | 180.500 | 1 | 180.500 | | |
| | Total | 1330.550 | 19 | | | |
| AAE | Between Groups | 1072.050 | 18 | 59.558 | 0.191 | 0.966 |
| | Within Groups | 312.500 | 1 | 312.500 | | |
| | Total | 1384.550 | 19 | | | |
| AAS | Between Groups | 957.300 | 18 | 53.183 | 0.879 | 0.700 |
| | Within Groups | 60.500 | 1 | 60.500 | | |
| | Total | 1017.800 | 19 | | | |
| AAEDUC | Between Groups | 1465.500 | 18 | 81.417 | 0.563 | 0.801 |
| | Within Groups | 144.500 | 1 | 144.500 | | |
| | Total | 1610.000 | 19 | | | |

AAM= Academic Achievement of Medical Students, AAE= Academic Achievement of Engineering Students, AAS= Academic achievement of Sciences Students, AAEDUC= Academic achievement of Education Students, df= Degree of Freedom, F= F- statistics, Sig.= Level of significance at $p \leq 0.05$

Results are presented from this table that there were no statistically significant differences between the academic achievements of students with regard to the type of college.

**Table (5): The Relationship between Students' Self-management and Their Socio-demographic Characteristics**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 52.395 | 6.342 | | 8.262 | 0.000 |
| | Gender | -8.624 | 2.441 | -0.455 | -3.533 | 0.001 |
| | Education | 3.661 | 1.147 | 0.432 | 3.192 | 0.002 |
| | Socioeconomic Status | 0.005 | 0.126 | 0.003 | 0.039 | 0.969 |
| Dependent Variable: Self-management B= Regression Coefficient, Std. Error= standard error, t= T-test, Sig.= Level of Significance | | | | | | |

This table depicts that there is highly significant relationship between students' self-management and their gender and education only and age is excluded out of the regression model.

**Table (6): The Relationship between Students' Academic Achievement and their Socio-demographic Characteristics**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 32.861 | 9.824 | | 3.345 | 0.001 |
| | Gender | 5.667 | 3.781 | 0.357 | 1.499 | 0.138 |
| | Education | -0.407 | 1.777 | -0.057 | -0.229 | 0.819 |
| | Socioeconomic Status | 0.556 | 0.195 | 0.381 | 2.856 | 0.006 |

Dependent Variable: Self-management B= Regression Coefficient, Std. Error= standard error, t= T-test, Sig.= Level of Significance

This table indicates that there is highly significant relationship between students' academic achievement and their socioeconomic status only and age is excluded out of the regression model.

## Discussion

Findings out of the data analysis indicate that most of the colleges' students have practiced fair to good level of self-management. Such findings are very obvious in the overall evaluation of colleges' students' self-management (Table 1). This can be interpreted in a fashion that the colleges' students have experienced this varied level of self-management as result of their inadequate background relative to such management. It has been reported that successful learner can achieve own learning goals through self-management. It denotes to approaches, procedures and methods that can be castoff to straight students' actions and performances efficiently. When it originates to study, self-management contains goal setting, planning and managing the time. Self-management is a main ability that will benefit students during their life [(2)]. Self-management helps students control impulses, set goals, and get organized so they can be strong self-motivators. Students who can regulate their emotions, control impulses and manage stress are more likely to identify goals and consistently meet them. The students have to be provided with goal-setting, the breadth and depth of research on the topic of self-management and how growing this skill can temper the current problem. Students will assess strategies that schools and other educators use to empower students with self-management mindsets and skills and tweak them so they are relevant to the classroom and students. While there are relatively simple self-management interventions, it is important to note that this course will not provide a cure-all methodology, but strategies and foundational knowledge to grow the students' self-management skills in the long term [(7)]. Findings out of the data analysis reveal that all of the colleges' students have experienced good level of academic achievement. Such findings are very noticeable in overall evaluation of colleges' students' academic achievement (Table 2). This can be justified in a manner that the colleges' students are well-oriented toward this achievement regardless to their educational background or colleges. Academic achievement is the current level of student learning. More specifically, academic achievement refers to the percentage of students in the school who meet the education standards currently classroom level or beyond. This achievement is measured using tests at the state level in math and reading. Achievement is measured also by using assessments in the case of science, but will not be used scientific assessments of accountability under which ESSA. Why Does Academic Achievement Matter? A standards-based education system promotes equity by establishing a baseline of knowledge and skills that all students, regardless of their background, should master as part of their education. Measuring academic achievement provides key information about students' mastery of standards. Identifying schools where many students are struggling to achieve proficiency on state tests provides a reasonable starting point when searching for schools that would most benefit from support. Looking at academic achievement data in combination with other information helps to prioritize schools for support. More broadly, academic achievement for all students is one of the key goals of the public school system, and mastery of state standards provides students with useful skills for a fulfilling and productive life. While not all aspects of achievement can be efficiently measured and compared statewide, it is important to include some measurement of academic achievement when evaluating and prioritizing support for schools. The tests used to measure academic achievement are meant to provide system-level data about how schools, districts, and the state are functioning. An individual student's scores should not be used to determine, for example, which courses they can or cannot take during their K-12 years. Schools should look at multiple sources of student-level data when planning instruction and support for individual students [(8)]. Such comparison shows that there are no differences between colleges' students' self-management (Table 3) and academic achievement (Table 4). In general, such findings present evidence that these students almost share the same level of self-management and academic achievement regardless of differences in their area of study or specialty. Analysis of such relationship indicates that there is highly significant relationship between students' self-management and their gender and education (Table 5). Such findings can be explained in a mode that the better the students' education the well they perform self-management, as well as male and female students present different application of self-management through their study. There is also a very important relationship between the academic achievement of the students and their socioeconomic status (Table 6). This can be clarified in a way that the better the students' socioeconomic status the advanced their academic achievement. A study is

looking at the relationship between socio-economic status (SES) peer academic achievement and individual. Results of the study indicate that the social status of the family, peers, in particular, has a large independent and objective academic achievement on the impact of the individual, which is only slightly less than the social status of the family of the individual [11].

## Conclusion

Most of the colleges' students experience fair to good level of self-management and good level of academic achievement probably due to their education and orientation. Colleges' students do not present differences in their self-management and academic achievement due to the level of their consciousness of such issues. Self-management, for students, is affected by their gender and education. Academic achievement is influenced by the students' socioeconomic status.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the -Kindy College of Medicine, University of Baghdad, Iraq and all experiments were carried out in accordance with approved guidelines.

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# Risk factors for Cardiovascular Diseases among Diabetic Patients attending Al Nasiriyha Diabetic and Endocrinology Center

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## Abstract

**Objective**: To determine the risk factors for cardiovascular disease among patients with type 2 diabetes.

**Methods:** The data were collected by utilization of the study instruments and employment of scheduled interview as means data collection. The data collection process was performed from July 2nd / 2019 / October 2nd/ 2019. A questionnaire was designed constructed by the researcher to measure the variable .The questionnaire consisted of3 parts which are demographical, clinical information and risk factors. The reliability of the questionnaire was determined through a pilot study and the validity through a panel of experts. The data were analyzed through the application of descriptive statistic frequency, percentage, and the application of inferential statistical procedures, which include Pearson correlation coefficient, and contingency coefficient.

**Results:** Results: The result of the study showed that the most common modifiable risk factors were low HDL-C levels (69%), smoking (40%), hypertension (46%), Overweight (57%), high triglycerides (21%), hypercholesterolemia (15%), and high LDLC (12%). All these factors were positively and significantly associated with the development of CVD. Whereas, the most common non-modifiable risk factors were age 50 years and more, sex, family history of CVD .

***Keywords:*** *risk factors ,cardiovascular diseases, diabetic patients.*

## Introduction

The International Diabetes Federation (IDF) estimates that worldwide, 415 million people have diabetes, 91% of whom have type 2 diabetes mellitus (T2DM) [1]. People with diabetes comprise 8.8% of the world's population, and IDF predicts that the number of cases of diabetes will rise to 642 million by 2040 [1]. The prevalence of T2DM has been steadily increasing over time. Using data from the Framingham Heart Study, Abraham et al. [2] noted that the overall annualized incidence rates of the disease per 1000 persons increased from 3.0 in the 1970s to 5.5 in the first decade of the 2000s. That change represented an increase in the incidence of T2DM of 83.3% and was higher in males than females by a factor of 1.61. Cardiovascular diseases, i.e. Coronary heart diseases, stroke, and peripheral vascular diseases account for the majority of deaths in diabetic patients (2). Diabetes mellitus, hypertension, cigarette smoking, dyslipidemia, obesity and physical inactivity are established risk factors for cardiovascular diseases (CVD). These risk factors are known as traditional or conventional cardiovascular risk factors (2, 3). The conventional cardiovascular risk factors have

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greater impact on diabetic patients than non-diabetics [2, 4]. The multiple risk factors intervention trial (MRFIT) showed the presence of any one, two or all three risk factors (hypertension, cigarette smoking, dyslipidemia) increased the risk of CVD death more in diabetics than non-diabetic men (RR of 4.8, 4.0 and 2.6, respectively) [4]. In view of the growing burden of diabetes and its cardiovascular complications in the developing world, it is crucial to determine the physical and metabolic characteristics of diabetic persons in this part of the world. This study was conducted to assess the prevalence of cardiovascular risk factors among diabetic patients on follow-up at the diabetic clinic of Al Nasiriyha Diabetic and Endocrinology Center.

## Material and Method

**Design of the Study:** A descriptive quantitative design was carried out through the present study in order to achieve the early stated objectives during the period from 8th of January, 2019 to the 5 th of July, 2019.

**Administration Arrangement**: After getting the approval of the council of Nursing College upon the study, the researcher submitted a detailed description including the objective and methodology (questionnaire) of the study to the Thi-qar Health Directorate ( Training and development department) in order to obtain an official permission, and was presented to AL- Diabetic Center ensure their agreement and cooperation .

**Setting of the Study :** The study was conducted at outpatient clinics in Al Nasiriyha Diabetic and Endocrinology Center, one of these Center is located in An Nasiriyah city, Thi-qar, Iraq.

Al Nasiriyha Diabetic and Endocrinology Center is the only center in Thi-qar that provides diabetic patients with education on insulin self-injection techniques. A follow-up appointment with a clinician, in addition to the low-cost services such as affordability of medications and laboratory tests once every 3–5 months, is commonly provided by this center for every registered diabetic patient.

**The Sample of the Study** : The Sample of the Study :A non-probability (purposive) sample of (100) patients was selected. All the patients who diagnosed DM and they had a medical records and attending Al -Nasiriyha Diabetic and Endocrinology Center

**Ethical consideration:** The participants in were verbally informed about the aims of the study and had been asked to participate voluntarily. They also had been informed that they can refuse to answer a certain question or withdraw from the study at any time. Emphasis was placed on creating a relaxed atmosphere during interview through the use of good communication skills with participants.

**The Study Instruments** : consisted of two major parts constructed for the purpose of the study. Part I: Socio- Demographic Data: It consists of (7) items, related to the Socio-demographic characteristics of these patients which include (age, gender, and occupational status, level of education, marital status, monthly income, and residential area). Part II: Past History: Chronic Diseases (hypertension, diabetes mellitus and others), family history which includes (high blood pressure, diabetes mellitus, and heart disease). Part III: The three part consists of the questionnaire related to risk factors, which includes four sections (diagnosis, past history, smoking and alcohol consumption, BMI measures and biochemical measures). Part IIII: This domain was measured through (3) items of physical activity (1) item, simple exercises such as (curvature, stop, a leisurely walk and Physical relaxation exercises); (1) item; moderate exercises such as (Brisk walking, shopping , move light things) and (1) items, strong exercises (Vigorous exercise ) such as (Jogging quickly , running, drive car , lifting heavy objects , exercise). These items were rated and scored by three level types option scale for each type of physical activity as (don't do (1), sometime 1-6 times weekly (2), always 7 or more time weekly (3),. The high score of physical activity domain obtained, it means higher modification by patients.

Three rating scale were used for physical activity and the first of stress management as following

$$= \frac{\text{cut of point}}{\text{no.of scale}} \times 100 = \frac{\text{cut of point}}{\text{no.of scale}} \times 100$$

$$= \frac{2}{3} \times 100 = = \frac{2}{3} \times 100 = 66.6$$

So the interval had been ranged between (66.6-100) that, represented the rate of the lifestyle modification

$= \frac{100-66.6}{3} = 11.1 = \frac{100-66.6}{3} = 11.1$

66.6 + 11.1= 77.7

66.6 to 77.7 is low lifestyle modification

77.7 + 11.1=88.8

77.8 to 88.8 are moderate lifestyle modification

88.8 + 11.1 = 99.9 = 100

88.9 to 100 is high lifestyle modification

In addition less than 66.6 is no effect

Risk factors and positive screens were determined using accepted guidelines to match comparable publications. Obesity was defined as a measured BMI of ≥30 kg/m2.20 Stress was a risk factor if the subject reported being stressed at ≥3 days a week. Alcohol abuse was defined as a male consuming ≥3 drinks/day or a female consuming ≥2 drinks/day.17 A positive screening for hypertension was defined as a systolic blood pressure ≥160 mm Hg or a diastolic blood pressure ≥90 mm Hg. Positive screen for diabetes was a random blood glucose level ≥160 mg/dL.22 Random blood cholesterol ≥200 mg/dL was a positive screen for high cholesterol.

**Conducting Pilot Study:** Before starting the data collection, a pilot study was conducted on (10) patients who have coronary artery disease for the following purposes:

Determine the reliability of the questionnaire .Estimate the time required for the data collection .Obtain the clarity and the content adequacy of the questionnaire and observation Identify the barriers that may be encountered during the data collection process

**Validity:** The validity of the instrument was established through a panel of (8) experts. who had more than five years' experience in their fields in order to achieve study objectives.

**Reliability:** results of the reliability showed very high level of stability and internal consistency of principle parts concerning item's responses' of the questionnaire, all those were calculated by using the major statistical parameter: Alpha Cronbach, revealed that the person correlation coefficient is (0.73).

**Statistical Analysis :**analysis of the data was employed through the application of the following statistical data analysis approaches: A: Descriptive statistical data analysis: including Percentage , Mean, SD, (Frequency=( F

B: Inferential statistical data analysis.

## Result

**Table 1: Distribution of Patients with Respect to Patient's History.**

| **Basis Information** | **Variable** | | **Frequency** | **Percent** |
|---|---|---|---|---|
| Duration of diagnosis **of diabetic** | **1 – 5 years** | | **54** | **54.0** |
| | **6 – 10 years** | | **5** | 5.0 |
| | 11 years and above | | 41 | 41.0 |
| Patient History | High blood pressure | No | 61 | 61.0 |
| | | yes | 39 | 39.0 |
| Mean ± SD | | | 2.19± 1.86 | |

***Cont...*** **Table 1: Distribution of Patients with Respect to Patient's History.**

| | | | |
|---|---|---|---|
| Family History | High blood pressure | 53 | 53.0 |
| | Diabetic Mellitus | 15 | 15.0 |
| | High blood pressure& Diabetic mellitus | 25 | 25.0 |
| | No Chronic Disease | 7 | 7.0 |
| | Total | 100 | 100.0 |
| Mean ± SD | | 1.022± 1.025 | |

**Table 2.Distribution of Patients according to Smoking and Alcohol drinking**

| **Basis Information** | **Variable** | **Frequency** | **Percent** |
|---|---|---|---|
| Smoking | Currently smoking | 40 | 40.0 |
| | Previous smoking | 25 | 25.0 |
| | Not Smoking | 35 | 60.0 |
| | Total | 100 | 100.0 |
| Mean ± SD | | 1.60± 1.99 | |
| Alcohol drinking | Drink Currently | 1 | 1.0 |
| | Previous drinking | 1 | 1.0 |
| | No | 98 | 98.0 |
| | Total | 100 | 100.0 |
| Mean ± SD | | 1.99± .100 | |

**n= number of samples, F= frequency, %=percentage,**

**Table 3. Distribution of Patients according to BMI, Blood pressure and blood sugar measures**

| **Basis Information** | **Variable** | **Frequency** | **Percent** |
|---|---|---|---|
| Body Mass Index (Kg/m2) | Normal (<25) | 20 | 20.0 |
| | Overweight (25-29.9) | 57 | 57.0 |
| | Obese (30-34.9) | 11 | 11.0 |
| | Obese II (=>35) | 12 | 12.0 |
| | Total | 100 | 100.0 |
| Mean ± SD | | 2.15± .880 | |
| Blood Pressure | SBP=<140 & DBP<90 | 45 | 45.0 |
| | SBP>140 & DBP=>90 | 55 | 55.0 |
| | Total | 100 | 100.0 |

| | | | |
|---|---|---|---|
| Mean ± SD | | 1.55± .500 | |
| Blood sugar | Fasting blood glucose level <126mg/dl | 28 | 28.0 |
| | Fasting blood glucose level >126mg/dl | 72 | 72.0 |
| | Total | 100 | 100.0 |
| Mean ± SD | | 1.72± .451 | |

n= number of samples, F= frequency, %=percentage, BMI= body mass index, SBP=systolic blood pressure, Diastolic blood pressure, <= less than, > = greater than, Kg= kilogram, m2= meter square

**Table 4. Distribution of Patients according to Chemistry Blood Level**

| **Basis Information** | **Variable** | **Frequency** | **Percent** |
|---|---|---|---|
| Cholesterol blood level | Normal < 200 mg /dl | 63 | 63.0 |
| | Border line of high risk 200-239.9 mg/ dl | 22 | 22.0 |
| | High risk >=240 mg /dl | 15 | 15.0 |
| | Total | 100 | 100.0 |
| Mean ± SD | | 1.52± .745 | |
| Triglyceride blood level | Ideal < 150 mg /dl | 58 | 58.0 |
| | Border line of high risk 150-199.9 mg/ dl | 21 | 21.0 |
| | High risk >= 200 mg / dl | 21 | 21.0 |
| | Total | 100 | 100.0 |
| Mean ± SD | | 1.63± .812 | |
| High Density Lipoprotein (HDL) blood level | High >=40 mg/ dl | 69 | 69.0 |
| | Low < 40 mg /dl | 31 | 31.0 |
| | Total | 100 | 100.0 |
| Mean ± SD | | 1.31± .465 | |
| Low Density Lipoprotein (LDL) blood level | Normal (<130 mg /dl) | 73 | 73.0 |
| | Risky (130-159.9 mg/dl) | 15 | 15.0 |
| | High risk >= 160mg/dl | 12 | 12.0 |
| | Total | 100 | 100.0 |
| Mean ± SD | | 1.39± .695 | |

n= number of samples, F= frequency, %=percentage, >=, less than, <= greater than, HDL= High Density Lipoprotein, LDL= Low Density Lipoprotein, mg/dl= Milligrams per Deciliter

**Table (5) Assessment of physical Activity of diabetic Patients according to Mean of Scores and Relative Sufficiency**

| Items | | Not exercise No (%) | Sometimes 1-6 No (%) | Always 7/or more No (%) | M.S | R.S | Score level (Grade) |
|---|---|---|---|---|---|---|---|
| | The mild physical activity | 16 (16) | 42 (42) | 42(42) | 2.26 | 87.33 | Moderate |
| | The moderate physical activity | 18(18) | 45(28) | 36(36) | 2.18 | 78.66 | Moderate |
| | The strong physical activity | 46(46) | 40(40) | 14(14) | 1.68 | 59.66 | Low |

Cut of point=2, No= number, %= percentage, M.S=mean of score, R.S= relative sufficiency, low lifestyle modification = 66.6 – 77.7, moderate= 77.8 – 88.8 , high= 88.9 -100

## Discussion

The result of the present study has revealed that the prevalence of the smoking is (65% ). Even with the diabetic the (40.0 %) of patient were current smokers , and 25% were previous smokers. The report indicates that cigarette smoking increases the risk of coronary heart disease by itself. When it acts with other factors, it greatly increases the risk. Smoking increases blood pressure, decreases exercise tolerance and increases the tendency for blood to clot, (AHA, 2010). (14). Regarding alcohol consumption the present study revealed patient no consume alcohol is (98% ). , may be due to our value ,that the alcohol consumption is not continence with Muslim religion so the patient feel embarrassed to say or write. Regarding to the BMI (body mass index) the present study revealed about a third of diabetic patients, their BMI was equal and more than (25-29.9 Kg/m2). Similar result presented by (Ahmed, et al., 2018) (19). who conducted a study to Evaluation of risk factors for cardiovascular diseases among Saudi diabetic patients attending primary health care service. showed an overall prevalence of obesity were (57.7%). This difference in percentage between Iraqi people and other country may refer to high stress from siege and strong army operations through the war for many years. According to biochemistry (Lipid profile) the study shows that (15%) of the diabetic patients had total cholesterol levels of 240mg/dl or more. Significant proportions, (22% of the patients) were on the borderline high-risk levels (200-239 mg/dl). Similar result presented by (Abdosh, , et al., 2019) who conducted a study to Cardiovascular diseases risk factors among adult diabetic patients in eastern Ethiopia. showed an overall prevalence of Dyslipidemia (90.6%) (Table 4). Regarding to the triglyceride level the result of the present study shows that (21.0%) of diabetic patients had a prevalence were 200 mg/dl and more. The result demonstrated physical activity, according to relative sufficiency, the highest relative sufficiency was for mild physical activity such as (A leisurely walk, curvature, prostration ), while the lowest relative sufficiency was for strong activity such as (driving, Lifting heavy objects) that means there is no modification related to physical activity. This result may be due to the most (48.0 %) of the diabetic patients. Aged 60 years and more who already cannot do the strong exercise, or may be due the their cultured value In An Nasiriyah city, it is a sham to practice any type of sport when you become an old man may be due to the 22 percent of samples were woman, she usually spends most of time at the home.

## Conclusions

In accordance with the results of this study ,the researcher can conclude the following:

**1.** The most common modifiable risk factors were low HDL-C levels (58%) , smoking (65%) , hypertension (61%), obesity (27%), high triglycerides

(21%), hypercholesterolemia (15%), and high LDLC (12%). All these factors were positively associated with the development of CAD.

**2.** There is no modification related to physical activity where the relative sufficiency was lowest for strong physical activity than mild physical activity .

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Faculty of nursing and all experiments were carried out in accordance with approved guidelines.

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# Comparative Study between the Effect of Melatonin and Hyaluronic acid on Induced Bone Defect Healing in Rabbit

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## Abstract

This study was aimed to highlight the individual effects of melatonin (MEL) and hyaluronic acid (HA) on bone healing and repair mechanism and to investigate a possible effect, for a topical application. New Zealand rabbits used in this study were divided into three groups for two healing intervals the experimental groups were: 1. Experimental groups (20 rabbits): all animals subjected to surgical operation in right tibia, creating bone defect 3mm in depth and 4mm in diameter filled with 0.1ml. Hyaluronic acid gel and left tibia bone defect filled with melatonin gel. 2. Control group (10 rabbits): induced bone defect on the right side only. Animals' scarifications were done in 2 weeks and 4 weeks' durations. Routine processing and sectioning technique was performed for histological evaluation. At the 2weeks healing interval, highest mean value of all measured parameters were recorded at melatonin group while at 4 weeks, there is high significant difference in all parameters; (p-value 0.000) among all control and experimental groups**.** A significant number of positive effects of MEL, as well as HA, as individual compounds on the bone healing regeneration.

***Keywords:*** *Melatonin, Hyaluronic acid, Bone, Rabbit*

## Introduction

Biomaterials have different groups but we focus here on the naturally derived types that present already in the body from natural origin like melatonin and hyaluronic acid [1]. It should be stable, biocompatible; ideally osseoinductive and conductive, porous and similar to biological bone mechanically [2] Melatonin is discovered and isolated by Lerner in 1958, is a natural hormone produced mainly by the pineal gland but also by other tissues and organs, such as the retina, brain, bone marrow, Harderian gland, ciliary body, lens, thymus, airway epithelium, gonads, placenta, gastrointestinal tract and skin, in a circadian manner, with the highest level during the night (between midnight and 2 a.m. for healthy adults) and a minimum during the day. [3,4]

It act as a radical scavenger antioxidant (N-acetyl-5-methoxytryptamine) which has the ability to stimulate antioxidant enzymes that neutralize free radicals and ROS. Melatonin also contributes to the maintenance of bone health by promoting osteoblast differentiation and limiting osteoclastic activity. Bone healing process consists of inflammatory, proliferative, and remodeling phase. The production of free radicles causes cell damage and distribution of bone healing process due to the production of free radicals causes cell damage and disruption of bone healing process due to the chain reactions of protein and lipid peroxidation. Melatonin participates in the physiological functions of bone cells, promotes angiogenesis and, through its free radical scavenging properties, it may also serve as a preventive agent against radical-induced hard tissue damages [5]

Hyaluronic acid (HA) is a naturally-derived polymers biomaterial. It is a major component of the extra cellular matrix (ECM) and present in nearly every mammalian tissue and fluid. It plays a role in wound healing and it has been found in high concentrations in the early fracture callus, in lacunae surrounding hypertrophic chondrocyte in the growth plate and in the cytoplasm of osteoprogenitor cells [6]. (HA) has osteoconductive potential; it accelerates the bone regeneration by means of chemotaxis, proliferation and

successive differentiation of mesenchymal cells. HA may act as biomaterial scaffold for other molecules, such as BMP-2 and TGF-β, used in guided bone regeneration techniques and tissue engineering research**.** [7].

## Materials and Method

The materials used in the present study were hyaluronic acid gel, melatonin (5mg, USA), anesthetic solution: Ketamine hydrochloride 50 mg and Xylazine 2%, formalin 10%, ethanol alcohol 96%, xylol, paraffin wax, and Hematoxylin and Eosin (H&E) stain.

Thirty male New Zealand rabbits weighting (1.5–2kg), aged (6-12) months used in this study; they were divided into control group (10 rabbits) and experimental group (20 rabbits) tibial induced bone defect(with 3mm an diameter and 4mm depth) into right tibia filled with 0.1ml Hyaluronic acid gel and left tibia bone defect that filled with melatonin gel(5mg). While the control group induced bone defect in right side only. Rabbits are sacrificed by an overdose of anesthetic solution at two healing intervals 2 weeks, 4 weeks fifteen on each period. All tissue specimens, experimental and controls were fixed in 10% neutral formalin Animals were scarified and processed in routine paraffin blocks after complete decalcification of bone. Histological evaluation was performed using light microscope (OpticaB-350, Italy). Histomorphomatrical parameters are measure the number of bone cells (osteoblasts, osteocyte, and osteoclasts), trabecular area ($mm^2$), bone marrow area ($mm^2$) and trabecular number. Measurements were performed by image processing software program (ImageJ.exe)**(8)** . Microphotographs were taken by a camera (AIPTEK HD 1080P, China) attached to the microscope at power X40.

## Statistical analyses

Data were analyzed using SPSS (statistical package of social science) software version 25. In this study the following statistics were used:

1. Descriptive statistics**:** including means, standard deviations and statistical tables and figures.

2. Inferential statistics: including:

a) One-way ANOVA test**:** to compare the measured variables among the groups.

b) Tukey's HSD test**:** to test any statistically significant difference between each two groups.

c) Independent sample t-test**:** to test the effect of time on the measured parameters.

**Cl. 27(1), March 2015 Evaluation the effect**

## Results

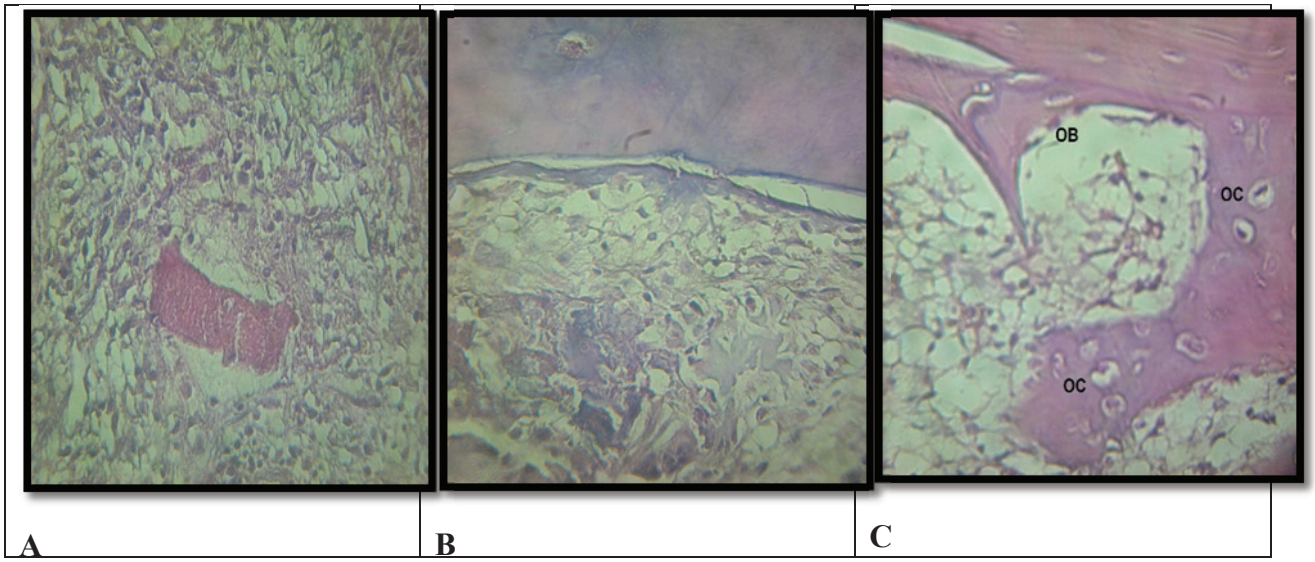


**Figure (1): Microphotograph view of defect area of 2 weeks healing period shows in: (A) Control group blood clot surrounded by inflammatory cells and bone marrow stromal cells (100X) .(B) Hyaluronic acid group: shows flecks of bone trabeculae and osteoid tissues rimed by few osteoblast(100X). (C) Melatonin group shows bone marrow surrounded by bone trabeculae with osteocyte (OC) inside and osteoblast (OB) at periphery (400X).**

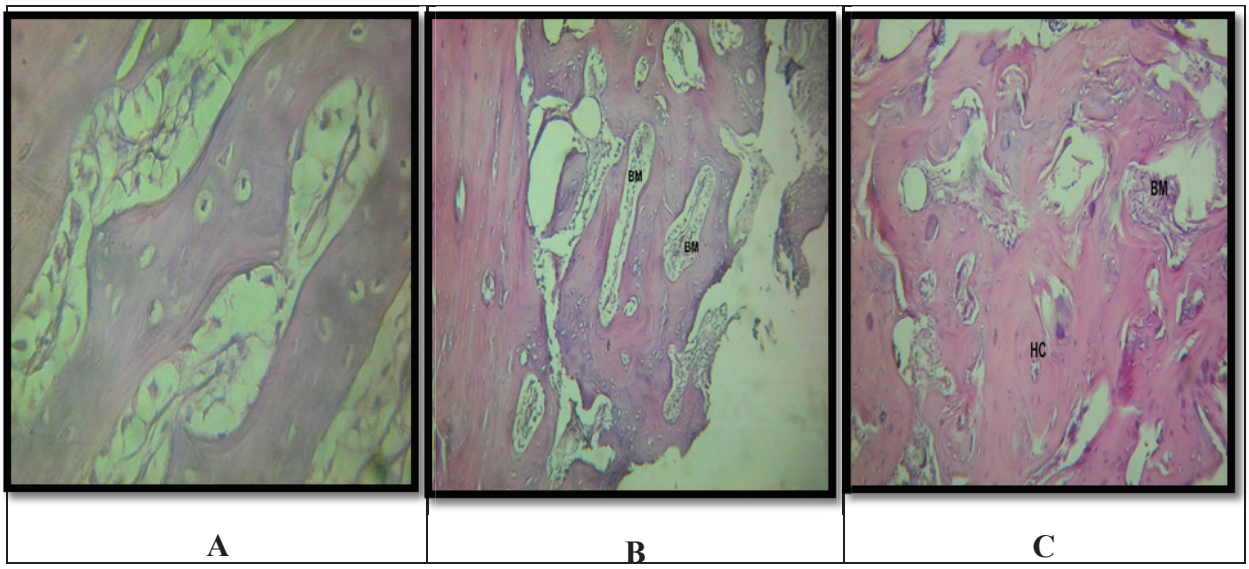


**Figure (2): Microphotograph view of defect area of 4 weeks healing period shows in: (A) Control group new bone trabeculae enclosing bone marrow (400X). (B) Hyaluronic acid group shows compacted bone trabeculae enclosing less bone marrow area (100X). (C) Melatonin group shows defect site filled with new bone (NB) enclosing marrow tissue (MT) (100X). Use Magnified views**

**Histomorphometrical analysis of bone architecture parameters:**

All measured parameters showed increased mean values with time, except for bone marrow area mean values decreased in all groups. At 2 weeks healing interval, highest mean values of all measured parameters were recorded at melatonin group however bone marrow area showed highest values in control group (Table 1). The melatonin and HA groups show a high significant differences in all bone histomorphometrical parameters compared with control group except **o**steocytes count non significance difference was recorded between control and HA groups(Table 2) .

**Table 1: Descriptive statistics and group difference in 2 weeks**

| Parameters | Groups | Descriptive statistics | | | Group difference | |
|---|---|---|---|---|---|---|
| | | N | Mean | S.D. | F-test | p-value |
| Trabecular Numbers | Control | 5 | 2.220 | 0.148 | 77.998 | 0.000 |
| | Melatonin | 10 | 5.810 | 0.801 | | |
| | HA | 10 | 4 | 0.240 | | |
| Osteocytes | Control | 5 | 5.800 | 0.837 | 1246.705 | 0.000 |
| | Melatonin | 10 | 23.680 | 1.220 | | |
| | HA | 10 | 6.030 | 0.221 | | |
| Osteoblasts | Control | 5 | 5.300 | 1.204 | 383.955 | 0.000 |
| | Melatonin | 10 | 24.160 | 2.051 | | |
| | HA | 10 | 10 | 0.330 | | |
| Bone Marrow Area | Control | 5 | 0.490 | 0.026 | 279.469 | 0.000 |
| | Melatonin | 10 | 0.212 | 0.020 | | |
| | HA | 10 | 0.410 | 0.026 | | |
| Trabecular Area | Control | 5 | 0.098 | 0.015 | 744.314 | 0.000 |
| | Melatonin | 10 | 0.462 | 0.025 | | |
| | HA | 10 | 0.153 | 0.018 | | |

**Table 2: Post hoc Tukey's HSD test for multiple comparisons at 2weeks healing interval**

| Parameters | Groups | | Mean Difference | p-value |
|---|---|---|---|---|
| Trabecular Numbers | Control | Melatonin | -3.590 | 0.000 |
| | | HA | -1.780 | 0.000 |
| | Melatonin | HA | 1.810 | 0.000 |
| Osteocytes | Control | Melatonin | -17.880 | 0.000 |
| | | HA | -0.230 | 0.880 |
| | Melatonin | HA | 17.650 | 0.000 |
| Osteoblasts | Control | Melatonin | -18.860 | 0.000 |
| | | HA | -4.700 | 0.000 |
| | Melatonin | HA | 14.160 | 0.000 |
| Bone Marrow Area | Control | Melatonin | 0.278 | 0.000 |
| | | HA | 0.080 | 0.000 |
| | Melatonin | HA | -0.198 | 0.000 |
| Trabecular Area | Control | Melatonin | -0.364 | 0.000 |
| | | HA | -0.055 | 0.000 |
| | Melatonin | HA | 0.309 | 0.000 |

At 4weeks of induced bone defect healing period, there were high significant differences (p-value 0.000) among all control and experimental groups (Table 3). The melatonin group revealed highest mean value in all parameters except bone marrow area and osteoblasts which recorded high significant differences (p-value 0.000) at control group and HA group respectively (Table 4).

**Table 3: Descriptive statistics and group difference in 4 weeks**

| Parameters | Groups | Descriptive statistics | | | Group difference | |
|---|---|---|---|---|---|---|
| | | N | Mean | S.D. | F-test | p-value |
| Trabecular Numbers | Control | 5 | 3.540 | 0.456 | 98.179 | 0.000 |
| | Melatonin | 10 | 10.630 | 1.361 | | |
| | HA | 10 | 4.900 | 0.994 | | |
| Osteoclasts | Control | 5 | 10.180 | 1.327 | 714.458 | 0.000 |
| | Melatonin | 10 | 34.230 | 1.572 | | |
| | HA | 10 | 15.200 | 1.135 | | |
| Osteoblasts | Control | 5 | 9.440 | 0.918 | 194.704 | 0.000 |
| | Melatonin | 10 | 25.210 | 1.602 | | |
| | HA | 10 | 26.200 | 1.932 | | |
| Bone Marrow Area | Control | 5 | 0.394 | 0.038 | 303.360 | 0.000 |
| | Melatonin | 10 | 0.108 | 0.017 | | |
| | HA | 10 | 0.230 | 0.013 | | |
| Trabecular Area | Control | 5 | 0.120 | 0.012 | 244.232 | 0.000 |
| | Melatonin | 10 | 0.569 | 0.041 | | |
| | HA | 10 | 0.410 | 0.040 | | |

**Table 4: Post hoc Tukey's HSD test for multiple comparisons**

| Parameters | Groups | | Mean Difference | p-value |
|---|---|---|---|---|
| Trabecular Numbers | Control | Melatonin | -7.090 | 0.000 |
| | | HA | -1.360 | 0.082 |
| | Melatonin | HA | 5.730 | 0.000 |
| Osteoclasts | Control | Melatonin | -24.050 | 0.000 |
| | | HA | -5.020 | 0.000 |
| | Melatonin | HA | 19.030 | 0.000 |
| Osteoblasts | Control | Melatonin | -15.770 | 0.000 |
| | | HA | -16.760 | 0.000 |
| | Melatonin | HA | -0.990 | 0.389 |
| Bone Marrow Area | Control | Melatonin | 0.286 | 0.000 |
| | | HA | 0.164 | 0.000 |
| | Melatonin | HA | -0.122 | 0.000 |
| Trabecular Area | Control | Melatonin | -0.449 | 0.000 |
| | | HA | -0.290 | 0.000 |
| | Melatonin | HA | 0.159 | 0.000 |

## Discussion

This study was aimed to highlight the individual effects of (MEL) and (HA) on bone healing and repair mechanism and to investigate a possible effect, for a topical application.

Thus, it seems that local administration of melatonin during bone fracture could directly stimulate osteoblasts from the endosteum. This was in agreement with the findings shown by Nakade et al [9]

Melatonin has been recently reported to stimulate osteoblasts proliferation and differentiation **[9, 10].**

These results were also in agreement with those of Cutando et al [11]

Finally, (MEL) acts as stabilize cell membranes, thereby making them more resistant to oxidative attacks. [12-15].

HA enhances the bone healing regeneration [16] While Aslan etal [17] revealed that HA stimulate bone healing through accelerating the three phases of healing; inflammation, proliferation and migration of mesenchymal cells and they confirmed that HA needs an osteoconductive scaffold to be effective, Other study illustrated that the HA was osteoconductive material that enhance osteogenesis and accelerated bone healing process by promoting cell adhesion and osteoblast differentiation. [18]

## Conclusions

A significant number of positive effects of MEL, as well as HA, as individual compounds on the bone healing regeneration.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved and all experiments were carried out in accordance with approved guidelines.

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# Knowledge and Protective Health Behaviors Concerning Risk Factors for Coronary Heart Disease among Baghdad University Students

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## Abstract

**Background:** Coronary heart disease, a gradual buildup of fatty deposits in thecoronary arteries, occurs as a result of several risk factors with 75% attributable tolifestyle choices.

**Objectives**: to evaluate knowledge and behaviour of Baghdad University students concerning coronary heart disease and to identify the relationship between demographic characteristic data with student's knowledge and healthbehavior.

**Methodology**: A cross-sectional design study utilizing a stratified random sampling method. Students of all colleges of Baghdad University (BU) in Baghdad City were included. The respondents were randomly selected from each college. The sample size was 200. Knowledge, health behaviour questionnaire was developed and distributed to the respondents involved. The data collected was analyzed using SPSS version 20.0.

**Results:** The majority of the study were female who accounted for (54%) of the total participants while male constituted (46%). Most of the study participants (35%) were ages between 20 and 21 years old. Study participants' distribution in equal forms on colleges twenty-five percent for each college. (28.5%) of the students were first class.The majority of students (76.5%) were single and the remainder was married. Majority (79%) lived in urban areas while the rest (21%) lived in rural areas.

**Conclusions:** findings of study shows that, undergraduate students have poor knowledge regarding risk factors for coronary heart diseases, as well as results demonstrate overall students have good behaviour toward preventive measurement about risk factors of CHD.

***Keywords:*** *Knowledge, Health behavior, Students, Risk Factors, Coronary Heart Disease*

## Introduction

Coronary heart disease (CHD) is a major public health problem worldwide. The coronary atherosclerosis is the major cause of coronary artery disease. However non atherosclerotic types of coronary heart disease are also reported. The clinical presentation of coronary artery disease includes angina pectoris, myocardial infarction, and chronic coronary heart disease[(1).]According to the World Health Organization (WHO), there were 7.4 million deaths due to ischemic heart disease in 2012, with high-income countries and upper-middle-income countries accounting for 158 and 107 deaths per million, respectively[(2,3).]Multiple risk factors are involved in the development and progression of CAD. In general, risk factors of CVD and CAD can be divided into two groups. The first group is non-adjusted risk factors such as age, sex, race, and family history. The second group is adjustable risk factors such as hypertension, diabetes mellitus (DM), dyslipidaemia, overweight, and smoking[(4,5).]

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## Methodology and Materials

A cross-sectional descriptive and analytical study to assess the knowledge and health behaviour regarding coronary heart disease among students of Baghdad University. This study was conducted at Bagdad University between December15th 2016 up to the end of 10thmarch 2018. A tool of knowledge, health behaviour questionnaire was developed and distributed to the participants in this study. The questionnaire was validated by conducting the pre-testing among 20 students in a pilot study. The content validity of the questionnaire was verified by expert of faculty of nursing. The questionnaires were distributed to the selected undergraduate students of all the four colleges in Baghdad University. The stratified random sampling method was utilized in selecting the participants. The inclusion criteria for the participants were age of 18 years old and above of both genders, male and female, which include Year 1 to Year 4 from each faculty. The sample size calculated was 200, inclusive of the 10% non-response rate.Proportional allocation from all grade levels (1 to 5 in all colleges).

## Results

The majority of the study were female who accounted for (54%) of the total participants while male constituted (46%). Most of the study participants (35%) were ages between 20 and 21 years old. Study participants' distribution in equal forms on colleges twenty-five percent for each college. (28.5%) of the students were first class. High percentage of the students was single and the remainder was married. Majority (79%) lived in urban areas while the rest (21%) lived in rural areas.

**Table (1) The Mean of Score of Students Knowledge Concerning Risk Factors for Coronary HeartDisease.**

| No | Items | True | | False | | MS | SD | A.D |
|---|---|---|---|---|---|---|---|---|
| | | No | (%) | No | (%) | | | |
| 1 | Smoking | 198 | 99.0 | 2 | 1.0 | .99 | .100 | Pass |
| 2 | Alcohol | 113 | 56.5 | 87 | 43.5 | .56 | .497 | Good |
| 3 | High blood pressure is a risk factor | 146 | 73.0 | 54 | 27.0 | .73 | .445 | Good |
| 4 | High cholesterol | 133 | 66.5 | 67 | 33.5 | .66 | .473 | Good |
| 5 | Individuals who suffer DM are at more risk for CHD | 114 | 57.0 | 86 | 43.0 | .57 | .496 | Good |
| 6 | Being overweight increases a person's risk for CHD | 91 | 45.5 | 109 | 54.5 | .46 | .499 | Poor |
| 7 | BMI of more than 30 is considered as obese | 107 | 53.5 | 93 | 46.5 | .54 | .500 | Good |
| 8 | Diabetes is a risk factor for developing CHD | 87 | 43.5 | 113 | 56.5 | .44 | .497 | Poor |
| 9 | High blood sugar puts a strain on the heart disease | 86 | 43.0 | 114 | 57.0 | .43 | .496 | Poor |
| 10 | People with diabetes have high cholesterol | 74 | 37.0 | 126 | 63.0 | .37 | .484 | Poor |
| 11 | People with DM tend to have low HDL (good) cholesterol | 87 | 43.5 | 113 | 56.5 | .44 | .497 | Poor |

***Cont...*** **Table (1) The Mean of Score of Students Knowledge Concerning Risk Factors for Coronary HeartDisease.**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 12 | Unhealthy diets | 100 | 50.0 | 100 | 50.0 | .50 | .501 | Good |
| 13 | High level of density lipoprotein | 93 | 46.5 | 107 | 53.5 | .46 | .500 | Poor |
| 14 | Physical inactivity | 48 | 24.0 | 152 | 76.0 | .24 | .428 | Poor |
| 15 | Stress | 71 | 35.5 | 129 | 64.5 | .36 | .480 | Poor |
| 16 | Men and women experience many of same symptoms of a heart attack | 80 | 40.0 | 120 | 60.0 | .40 | .491 | Poor |
| 17 | Walking is type of exercise to be a preventive of CHD | 86 | 43.0 | 114 | 57.0 | .43 | .496 | Poor |
| 18 | Daily exercise can prevent CHD | 108 | 54.0 | 92 | 46.0 | .54 | .500 | Good |
| 19 | Eating fruits or vegetable | 104 | 52.0 | 96 | 48.0 | .52 | .501 | Good |
| 20 | Avoid drinking alcohol | 137 | 68.5 | 63 | 31.5 | .68 | .466 | Good |
| 21 | Tobacco cessation | 103 | 51.5 | 97 | 48.5 | .52 | .501 | Good |
| 22 | Prayer | 91 | 45.5 | 109 | 54.5 | .46 | .499 | Poor |
| 23 | Prime wherefores of heart attacks is ‚stress‘ | 99 | 49.5 | 101 | 50.5 | .50 | .501 | Good |
| 24 | Most cholesterol in eggs found in yellow part | 53 | 26.5 | 147 | 73.5 | .26 | .442 | Poor |
| 25 | Polyunsaturated fats are healthier for the heart than the saturated fats | 59 | 29.5 | 141 | 70.5 | .30 | .457 | Poor |
| 26 | Eating a lot of red meat increases heart disease risk | 62 | 31.0 | 138 | 69.0 | .31 | .464 | Poor |
| 27 | Taking an aspirin each day decreases the risk of getting heart disease | 52 | 26.0 | 148 | 74.0 | .26 | .440 | Poor |
| 28 | Dietary fiber lowers blood cholesterol | 62 | 31.0 | 138 | 69.0 | .31 | .464 | Poor |
| 29 | Most cholesterol in eggs found in yellow part | 15 | 7.5 | 185 | 92.5 | .08 | .264 | Poor |
| 30 | HDL refers to „good“ cholesterol, and LDL refers to „bad“ cholesterol | 36 | 18.0 | 164 | 82.0 | .18 | .385 | Poor |
| | Total | 2695 | | 3305 | | 0.45 | | |

(A.D.): Assessment Degree, M.s=mean of score [(0 - .49) = fail (F); (0.5 –1) = Pass(P)]

**Table (2) The Mean of Score of Health Behaviour PreventionConcerningRisk Factors for Coronary HeartDisease.**

| No | Items | Strong agree | | Agree | | Disagree | | MS | A.D |
|---|---|---|---|---|---|---|---|---|---|
| | | No | (%) | No | (%) | No | (%) | | |
| 1. | Doing exercise to maintain a healthy lifestyle | 139 | 69.5 | 59 | 29.5 | 2 | 1.0 | 2.68 | G |
| 2. | Smoking is bad for health. | 127 | 63.5 | 65 | 32.5 | 8 | 4.0 | 2.60 | G |
| 3 | Maintain my weight according to my body mass index | 136 | 68.0 | 60 | 30.0 | 4 | 2.0 | 2.66 | G |
| 4 | Take less oily food | 128 | 64.0 | 65 | 32.5 | 7 | 3.5 | 2.60 | G |
| 5 | Taking a healthy diet | 97 | 48.5 | 91 | 45.5 | 12 | 6.0 | 2.42 | G |
| 6 | Exercising for 30 minutes most days | 110 | 55.0 | 72 | 36.0 | 18 | 9.0 | 2.46 | G |
| 7 | Control on blood pressure | 110 | 55.0 | 72 | 36.0 | 18 | 9.0 | 2.49 | G |
| 8 | Avoid eating fast food | 93 | 46.5 | 97 | 48.5 | 10 | 5.0 | 2.42 | G |
| 9 | Avoid stress | 35 | 17.5 | 107 | 53.5 | 58 | 29.0 | 1.88 | A |
| 10 | Avoid drinking carbonated drinks | 53 | 26.5 | 98 | 49.0 | 49 | 24.5 | 2.02 | A |
| 11 | Take fruit or vegetable in diet | 88 | 44.0 | 93 | 46.5 | 19 | 9.5 | 2.34 | G |
| 12 | Heart disease is severe | 66 | 33.0 | 88 | 44.0 | 46 | 23.0 | 2.10 | A |
| 13 | Choose a diet low in fat | 106 | 53.0 | 65 | 32.5 | 29 | 14.5 | 2.38 | G |
| 14 | Limits use of sugars | 86 | 43.0 | 94 | 47.0 | 20 | 10.0 | 2.33 | A |
| 15 | Get enough sleep | 128 | 64.0 | 67 | 33.5 | 5 | 2.5 | 2.62 | G |
| 16 | Take relaxation each day | 120 | 60.0 | 67 | 33.5 | 13 | 6.5 | 2.54 | G |
| 17 | Specific methods to control stress. | 123 | 61.5 | 59 | 29.5 | 18 | 9.0 | 2.52 | G |
| 18 | Perform physical activity | 133 | 66.5 | 62 | 31.0 | 5 | 2.5 | 2.64 | G |
| 19 | prevent heart attacks my exercising | 122 | 61.0 | 63 | 31.5 | 15 | 7.5 | 2.54 | G |
| 20 | Exercise decreases stress. | 113 | 56.5 | 72 | 36.0 | 15 | 7.5 | 2.49 | G |
| | Total | 2113 | | 1516 | | 371 | | 2.44 | G |

**(A.D.): Assessment Degree, M.s=mean of score [(1 – 1.66) = poor (p); (1.67 – 2.33)= Acceptance(F) ; [(2.34 – 3) = Good (G)**

**Table (3): Association Between Health Behaviour Prevention Score.**

| **DemographicVariables** | | **Sum of Squares** | **df*** | **Mean Square** | **F** | **Sig.** |
|---|---|---|---|---|---|---|
| **Age groups** | **Between Groups** | 1.546 | 2 | .773 | .914 | .403 |
| | **Within Groups** | 166.609 | 197 | .846 | | |
| | **Total** | 168.155 | 199 | | | |
| Gender | Between Groups | .445 | 2 | .222 | .890 | .412 |
| | Within Groups | 49.235 | 197 | .250 | | |
| | Total | 49.680 | 199 | | | |
| Academic year | Between Groups | 3.852 | 2 | 1.926 | 1.341 | .264 |
| | Within Groups | 283.023 | 197 | 1.437 | | |
| | Total | 286.875 | 199 | | | |
| Marital status | Between Groups | .047 | 2 | .023 | .128 | .880 |
| | Within Groups | 35.908 | 197 | .182 | | |
| | Total | 35.955 | 199 | | | |

**Sum of squares, Degree of freedom, Mean squares, Significant *: P ≤ 0.05**

## Discussion

Throughout the course of the data analysis of the current study indicated that students' knowledge concerning risk factors for coronary heart diseases. Thirteen questions to evaluate general knowledge related to risk factors of CHD. Only (45%) of the study sample answered correctly and (55%) responded incorrect "do not know". Knowledge questions were split to dietary pattern, medical and risk factors. Knowledge related to risk factors for CHD was answer correctly (Know) by (99%) majority of participation answer smoking main causes for CHD, most of them stated 56.5% alcohol main risk factors for CHD, most of them reported (73%) hypertension risk factors for CHD, (66.5%) answer hypercholesterolemia one of causes CHD, and most of them told (57%) diabetes mellitus all of them answer these main risk factors for cardio vascular disease, most of students(45.5%) told being overweight increase person risk for CHD,(43%) of them stated that high blood sugar puts strain on the heart disease, only (37%) of students answer correctly that individual with DM have high cholesterol.

The finding of the study agree with result obtained from other study who reportedrespondents' knowledge regarding the CHD risk factors who reported twenty five percent students graded smoking as the top most risk factor for CAD followed by hypertension high cholesterol, age, Family history, and high cholesterol diet. Correct identification of risk factors in the form of positive responses was highest for cholesterol levels (91%)[6].

Students' knowledge regarding risk factors for CHD. The most of the participants answered the danger factors questions items knowlikeambulation is type of exercise to be a preventive of CHD (43%), taken up fruits or vegetable is able to prevent from CHD (52%), avoid drinking alcohol reduced the risk of getting heart disease (68.5%), tobacco cessation prevent the risk of getting heart disease (51.5%) and body mass index of more than (30) is considered as obese (53.5). From all the risk factor questions, knowledge concerning physical inactivity (24%), stress (35.5%), both gender experience same symptoms of heart attacks world (40).

This findings is same line with result obtain from other study the researcher reported thatthe majority also demonstrated adequate knowledge regarding several CHD prevention measures, such as regular physical activity blood pressure control and smoking cessation .However, fewer participants demonstrated correct knowledge of other CHD risk factors, including diabetes, stress .Fewer subjects were aware of (HDL) and (LDL) as risk factors [7,8].

Health behaviour preventionaboutrisk factors coronary heart disease**.** Twenty questions exploring students health behaviour concerning of CHD.

This result of study are good agreements with other studies done by other researchers whose reportedthat the item with the highest proportion of positive health behavior was "smoking is bad for health" (93.7%,) (149) , "exercise to maintain a healthy lifestyle" (87.4%,) ( 139), I maintain my weight according to my body mass index (BMI(74.8%,)(119) ,take less oily food for healthy lifestyle (74.8),(119) ,I believe walking a lot can give benefits to my health (72.3), (115) and I should take fruit or vegetable in my diet for maintaining my health(77.4),(123) [9,10] .

Association between student'sknowledge score and the demographic characteristics (age, gender, academic year and marital status. The association between sociodemographic and students'knowledge score was explored. There are no significant relationship between gender and students knowledge(Chi-square = .526a), age (Chi-square = 2.118a) academic year (Chi-square = 3.507a) and marital status (Chi-square = .900a).

This result agrees with that of the other researcherwho reported ,The responses provided by the third year student nurses straight from school education and those mature students were found to be non-significant in relation to the twoage categories ($p>0.05$). The HB however, was shown to differ significantly between males and females ($p=0.04$), demonstrates the mean scores attained for both CHD knowledge and health behavior byboth gender[11,12].

The association between sociodemographic and Students attitudes Score was explored. There are no significant relationship between (age, gender, academic, marital status) and students'behaviour scores.

This finding Agree with results obtained from the study done by other researcherwho reported.The present study identifies that there was no significant relationship between total CHD knowledge and HB of the third year student nurses [13].

## Conclusions

This study demonstrate that, despite poor students knowledge regarding risk factors for CHD, as well as study indicated overall students have fair health behavior toward preventive measurement about risk factors of CHD.We recommendtohealth education programs about risk factors of coronary heartdisease; seek to improve understand the trouble of heart disease and work cooperatively to reduce them. Should be transmitted through the mediums of radio and television, posters, pamphlets, social media like Facebook and Twitter to be beneficial to accessing to younger people.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

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# Evaluation of Quality of Nursing Documentationin Surgical Wards at Baghdad Teaching Hospitals

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## Abstract

**Background:** Nursing documentation has been one of the most important functions of nurses.

**Objectives**: To evaluatequality of nursing documentsfor nursing care at surgical wardand to find out the relationship between demographic characteristic with nursing documents.

**Methodology:** A descriptive design study was conducted in the period of 1st January 2017 to 15th August 2017. Utilizing a stratified random sampling method (60) nursesworking in surgical ward atBaghdad teaching hospitals.

**Results:** The majority of the study participants were female who accounted for (58.3%) of the total participants while male constituted (41.7%) making a female male ratio of 1.5:1. Most of the study participants (46.7%) were between ages 18 and 27 years old. (71.7) of the nurses were married and the remainder was single. (45%) of the participants had instituite graduate.Majority of them (31.7%) were employee (1-5) years in surgical wards, and finally most of nurses(66.7%) have training session in the nursing documentation.

**Conclusions**: The study showed that nurses have poor nursing documentation in surgical ward and there is no significant association between the nursing documentation with some demographic characters of selected nurses but significant association between the nursing documentation with training course.

***Keywords:*** *Evaluation, Quality of Nursing Documentation, Nursing care,Surgical Wards*

## Introduction

Nursing documentation is considered as an important indicator todevelop nursing care. According to patient safety law, nurses have todocument nursing interventions[1] Nursing documented has jointly practical and legal embodiment in client care thus kind documentation and true notify are fundamental to mprove efficiency in client care. in any case of the way used to document, the client's health-care register is a solemn, legal records is client's patronage specifics[2,3].Nurse's ability to script in a pure brief, fair and legally precise way can safely decrease the danger of misunderstanding and passive patient result concerning to bad communication [4, 5].Nurses have accepted that registration isn't dismissing from nursing care and it is not permissive. It is an integral section of on file nurses' practices, and an important instrument that RNs use to secure high-fineness client care. Literature debate exceedingly the barriers encountered by nurses in recorded involving time limited, mismatches among staffing resources and work overload, shortage of pure guidelines for fill up documentation, repeated at documentation, and the routine systems and institutional policies usually related with protection precise documentation [6]. The major responsibility of nursing documentation are patients' information transport to other health team members, promote professional autonomy [7].

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## Methodology and Materials

A descriptive design study carried out toevaluate quality of nursing documentation in surgical wards atBaghdad teaching hospitals. The study was carried out during the period extended from 1st January 2017 to 15th August2017. The study population included all nursing staff in four selected hospitals. Inclusion criteria for nurses were having at least 12 month clinical experience and havingany educational level degree in nursing. The sample size estimated 70 nurses with pilot study. Then, these nurses selected to participate with stratified random sampling, according to the number of nursing staff employed in each hospital. Then, for evaluate of each nurse's documents, in four parts of nursing documents, was selected randomly and analyzed. The demographic data of self fill reporting. For evaluate of nursing documents for nursing care four observational checklists were used. These checklists were evaluate four parts of nursing documents including recording vital sign assessment (4 items), recording wound care(dressing) (11items), recording medication treatment (4 items) and recording intake and output (I & O) of fluids (10 items). The validity of checklists was determined by content validity and after receiving commends from 10 nursing member checklists were revised. The content validity of the instrument was established through a panel of (15) experts. . Test- Coefficients for (29) items of nursing documentation for nursing care were($r= 0.83^{**}$) . Data were collected between 8.30am to12.30 pm**.** The data is analyzed by using SPSS version 20.0.

## Results

This table revealed that( 58.3%) of the study samples were females, and most of them were age group (18-27) years old, a high percentage of them were institute graduate (45%), most of them(71.7%) were married, (31.7%) were for (1-5) years were employment in nursing, Majority of them (31.7%) were employee (1-5) years in surgical wards, and finally most of nurses(66.7%) have training session in the nursing documentation

**Table (1): The Mean of Score of Nurses Documentation for Nursing Care at Surgical Wards.**

| No | Items | Always | | Some time | | Never | | MS | Ass |
|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % | | |
| | Vital signs | | | | | | | | |
| 1 | Body temperature | 49 | 81.7 | 4 | 6.7 | 7 | 11.7 | 2.70 | Good |
| 2 | Pulse rate | 28 | 46.7 | 10 | 16.7 | 22 | 36.7 | 2.10 | Fair |
| 3 | Respiration rate | 34 | 56.7 | 9 | 15.0 | 17 | 28.3 | 2.28 | Fair |
| 4 | Blood pressure | 31 | 51.7 | 9 | 15.0 | 20 | 33.3 | 2.18 | Fair |
| | Total | | | | | | | 2.315 | Fair |
| | Wound care (Dressing) | | | | | | | | |
| 5 | Location of wound | 14 | 23.3 | 8 | 13.3 | 38 | 63.3 | 1.60 | Poor |
| 6 | Size of wound | 4 | 6.7 | 8 | 13.3 | 48 | 80.0 | 1.27 | Poor |
| 7 | Wound discharge | 2 | 3.3 | 1 | 1.7 | 57 | 95.0 | 1.07 | Poor |
| 8 | Amount of discharge | 2 | 3.3 | 4 | 6.7 | 54 | 90.0 | 1.07 | Poor |
| 9 | Color of discharge | 2 | 3.3 | 3 | 5.0 | 55 | 91.7 | 1.07 | Poor |
| 10 | Odor of discharge | 2 | 3.3 | 7 | 11.7 | 51 | 85.0 | 1.07 | Poor |
| 11 | Pain | 1 | 1.7 | 3 | 5.0 | 56 | 93.3 | 1.05 | Poor |
| 12 | Signs of infection | 3 | 5.0 | 1 | 1.7 | 56 | 93.3 | 1.12 | Poor |
| 13 | Signs of wound healing | 2 | 3.3 | 1 | 1.7 | 57 | 95.0 | 1.08 | Poor |
| | Dressing changes | | | | | | | 1.15 | Poor |
| 14 | Morning | 20 | 33.3 | 15 | 25.0 | 25 | 41.7 | 1.92 | Fair |
| 15 | Evening | 21 | 35.0 | 16 | 26.7 | 23 | 38.3 | 1.97 | Fair |
| | Total | | | | | | | 1.28 | Poor |
| | Drugs administration | | | | | | | | |
| 16 | Drug name | 57 | 95.0 | 2 | 3.3 | 1 | 1.7 | 2.93 | Good |

**Table (1): The Mean of Score of Nurses Documentation for Nursing Care at Surgical Wards.**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 17 | Route of administration | 52 | 86.7 | 6 | 10.0 | 2 | 3.3 | 2.83 | Good |
| 18 | Dose | 44 | 73.3 | 11 | 18.3 | 5 | 8.3 | 2.65 | Good |
| 19 | Time of administration | 54 | 90.0 | 2 | 3.3 | 4 | 6.7 | 2.87 | Good |
| | Total | | | | | | | 2.82 | Good |
| | Fluid intake & output | | | | | | | | |
| | Fluid intake | | | | | | | | |
| 20 | Oral route | 12 | 20.0 | 8 | 13.3 | 40 | 66.7 | 1.53 | Poor |
| 21 | IV infusion | 5 | 8.3 | 9 | 15.0 | 46 | 76.7 | 1.32 | Poor |
| 22 | Nasogastric tube | 1 | 1.7 | 5 | 8.3 | 54 | 90.0 | 1.12 | Poor |
| 23 | Gastrostomy route | 1 | 1.7 | 5 | 8.3 | 54 | 90.0 | 1.12 | Poor |
| | Fluid output | | | | | | | | |
| 24 | Urination | 8 | 13.3 | 7 | 11.7 | 45 | 75.0 | 1.38 | Poor |
| 25 | Defection | 8 | 13.3 | 7 | 11.7 | 45 | 75.0 | 1.38 | Poor |
| 26 | Vomiting | 8 | 13.3 | 7 | 11.7 | 45 | 75.0 | 1.38 | Poor |
| 27 | Chest tube | 2 | 3.3 | 4 | 6.7 | 54 | 90.0 | 1.17 | Poor |
| 28 | Drain | 5 | 8.3 | 1 | 1.7 | 54 | 90.0 | 1.18 | Poor |
| 29 | Nasogastric tube | 3 | 5.0 | 1 | 1.7 | 56 | 93.3 | 1.12 | Poor |
| | Total | | | | | | | 1.28 | Poor |

**(A.D.): Assessment Degree, M.s=mean of score [(1 – 1.67) = poor (p); (1.67 – 2.34)= Fair(F) ; [(2.34 – 3) = Good (G)]**

This finding of this table indicated that the mean of score was poor documentnonitems(5,6,7,8,9,10,11,12,13,20,21, 22,23,24,25,26,27,28&29),items (2,3,4,14 and15) was fair documentation, and good documentation on the remaining items.

## Discussion

Throughout the course of the data analysis of the current study, the findings show the majority of the study were female who accounted for (60%) of the total participants while male constituted (40%). Most of the study participants (46%) were ages group (18-27) years old,the level of education represented that most of them (38%) were from institute graduate,most of them(74%) were married, (38%) for (1-5) years were employment in nursing, most of nurses(70%) have training special session in the nursing documentation. Majority of them (34%) were employee (1-5) years in surgical ward, and finally

These findings are in line with study done by other researcherwho reported that study the average age of nurses was 32.40+ 5.58 years and they have a 6.40+ 3.58 years clinical experience .of all, 147(86.8%) nurses were female and 168 (98.8%) of them has a BS degree in nursing.83 (48.8%) nurses working in medical wards and 87(51.2%) were working in surgical wards [8].

These findings agreed with findings obtained from other study, who stated that the majority of participation nurses were female142 (87.6%) ,most of them 104(61.2%) were married their mean of age group was 31.38years,majority of them (51.2%) were working in surgical wards and almost of them (98.8%) had bachelor of science degree in nursing[9].

Twenty nine questions to assess nurses documentation for nursing care in surgical ward,in order to response to first question of the study table five. This table shows thenursing documentation in four selected parts of nursing documents including recording vital sign, recording wound care ,recording medication treatment, and recording intake and output of fluids ,the total mean of score was poor nursing documentation .Further investigation of results of study revealed the most of items that weren't recorded by nurses in recording wound care dressing ,location of wound(68%), size of wound (82%),wound discharge (96%),all items related to Amount of discharge,colour of discharge,odor

of discharge(96%),signs of wound healing(94%) all items that mention up that weren't recorded by nurses ,total mean of score related to wound care was poor.

In recording intake and output of fluids most items that weren't recorded were including, where not recording fluid take through mouth(64%), intravenous fluid(72%), nasogastric tube and gastrostomy route (88%) all items are absent (88%) all items are absent (88%) all items are absent in nursing documentation. Also recording were absent in fluid output including urination,defecation,vomiting (74%) ,chest tube, drain (88%) and nasogastric tube (92%) of all items related fluid intake and output not recorded by nursing ,the total of mean of score related to fluid intake and output was poor.

In recording vital sign assessment art most items are recorded the mean of score of vital sign was fair. In recording medication treatment most items are recorded by nurses, the total of mean of score related drugs treatment was good.

This finding was in good agreement with that obtained from other researcher reported that the quality of nurses' documents was moderate. Further investigation showed that most items that weren't recorded by nurses in recording nursing report part were including "recording the time of reports" (100%), "recording the response of patients to interventions" (97.9%) and "recording the time of nursing cares" (96.5%). In recording medication treatment part most items that weren't recorded were including" respect suitable method for correct errors" (40.6%) and other items were completely respected by nurses. In recording intake and output of fluids most items that weren't recorded were including recording accurate time of checking I & O of fluids" (100%) and "recording the differences between the intake and output of fluids" (78.3%). In recording vital sign assessmentpart most items that weren't recorded were including "recording the location of controlling vital signs", "recording the unit of temperature", "the limb used for controlling the blood pressure" (100%) and "the unit of blood pressure" (97.1%)[8].

Another study agree with the finding of the study who stated the nursing records showed In the vital sign section, data showed that all of them had moderate level and their mean score were 10.69 ± 0.52. In I&O fluid section data showed that 18.6% of flow sheets had moderate quality but most of them 81.4% had suitable quality and their mean score were 13.24 ± 1.07. In chronology sections, all of flow sheets had suitable quality. In drug intervention part, mean score was 11.78 ± 1.42 and most (85.9%) of them had good quality[9].

These findings agreed with study done by other researcher who reported that the quality of nursing care records was poor and inadequate to reflect individualized nursing care. Their results suggested that more emphasis is needed in nursing practice, and nursing education on the quality of record keeping in order increasing its evidential value[12].

These finding is the same line with study done Rangraz Jedi et al byIn one study, assessedthe quality of 540 nursing documents and reported that only 11% of these documents didn'tContain necessary information. Hanifi, (2002) assessed the quality of 30 medical records and reported that only 16.1% of nursing documents had a good quality and 35.8% of them didn't contain necessary information [14]. Findings of most other studies have also showed that nursing documents have inadequate information about nursing care process and are consistent with the findings of our study [15,16].

In order to respond to second question of the study the association between the nursing documentation for nursing care with some demographic characters of selected nurses. There are no significant relationship between nursing documentation and demographic characteristics of nursing, but significant relationship between nursing documentation and training course.

This finding was in good agreement with that obtained from other study who reportedthat correlation between age and clinical experience of nurses with quality of their documents chi-square test was used. Results showed that there was no meaningful statistical correlation between qualities of nurses' documents with their age ($\chi 2 = 1.34$, df = 2, p = 0.51)[8].

## Conclusions

The study concluded that; nurses that working in surgical ward in all selected teaching hospitals had poor documentationin most aspect of nursing daily documentation for nursing care. We recommend

conducting teaching programs or sessions must emphasize on all aspects of nursing documentation, for improving quality of nursing documentation and also the study recommends to nursing documentation must be covered widely and in-depth in nursing curriculum of nursing schools.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing-University of Baghdad and all experiments were carried out in accordance with approved guidelines.

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# Knowledge of Mother Regarding Children Vaccines

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## Abstract

Vaccines are important factors in the health system , and more benefit for the health and develops population, the study was conducted among chidden with age between one month to three yeas old age for period 4 months from April to July 2018 , were data collection among mothers (N=300) attending primary health care center in Al-Noor City – Baghdad , were 120(48%) at age (26-30) years old ,125 (41.6%) with primary education .

***Keywords:*** *Knowledge, Children Vaccination ,Vaccines.*

## Introduction

Immunization which is process that the individuals immune system becomes opposite to an agent cause ,immunization are widely used and less risk ,easier way .The immunization protects children from deadly diseases but also help in developing children immune system [1] . Vaccines are the more important factors in the health system ,and more benefits for the health and develops populations ,with WHO records, the children will die before 5 years each year due to some diseases that could prevented with vaccines can save life after birth, and protection more people from disability [2]. Some people still not use vaccination at all , or not completing their vaccines programs , administrations of vaccines through pregnancy is the save method in order to protect the pregnant females and fetus and young infant from diseases , vaccination program success which is depend on the knowledge and awareness of usefulness of vaccines to those who are at risk , without knowledge and fear of vaccination which lead to lower rate in this people(3).It is important to valuate parental knowledge toward immunization of children , immunization of the child starts immediately after birth (first 2 vaccines of hepatitis B and BCG ) are administrated through the first 72 hours of life(4).

Vaccinations ranges have increased at development and developing counties through World Health Organization (WHO) Expanding Program on Immunization (5)

Vaccination is the administration of vaccines in order to produce immunity in the body against of some diseases about to 85% of infants all over the world received 3 doses of diphtheria ,Tetanus ,pertussis , immunization program funds that vaccines against 12 diseases ,tuberculosis , hepatitis , diphtheria , tetanus, polio ,hemophilia influenza type b , measles ,rubella , mumps ,Rota virtue and pneumococci infection(6) Negative attitudes from parents such as fear of vaccination , side effects of vaccines like midlines , which are barriers for child vaccination, the knowledge of parents about vaccination from internet , socio media , medical workers, mothers consider the internet source is the main source after medical workers.(7) most side effects of vaccine are minor like pains , swelling or redness at the site of injection , but the major side effects such as severe allergic reactions which occur due to vaccines developed for short seizures which is called febrile seizure that occur at six months to five years old (8)

Vaccination which are contain of dead form of virus or bacteria which are causing the body to make antibodies that protect the child from the diseases. Most of vaccines are completed between birth and the age of six years, some the vaccines give more than once , and at different age , also in combination most countries will not permit the child start school without a complete vaccines or vaccine records , some times when a child risk the vaccination is missed(9)There is important for the parents to develop knowledge about vaccination because

the knowledge help to develop positive attitudes toward vaccination in order to reduce the burden of dreadful infectious diseases acceptance of any program is highly dependent on parental attitudes towards immunization fear of side effects which has negative impact on parental attitudes , vaccination dose is given at less than the minimum recommended dose to start vaccine and the minimum four – week interval may lessen the antibody response due to sub-optimal sero conversion rate and it should be repeated it the vaccine is administer greater four days before the minimum age (10)

**Aim** : To estimate the knowledge of mothers toward vaccines among children aged for one month to three years attending primary health care centers of family medicine in Baghdad –Iraq .

**Material and Methods :**Descriptive observation study was conducted on three hundred mothers for duration 4 months from April to July 2018 , in the out patient department of primary health care center which is called of family medicine in Al-Noor city , Baghdad , Iraq , mothers which are visited were enrolled in the study , mothers with children of age one month to 3 years, all participated Women given advices towards the aim of present study , a data collection included 3 days per week and it suits our present study was a framed , it contains demographic data , as child age , mother age , education status , mother occupation ,majority of served mothers with age 20 to 50 years , a qualitative interview was done using 30 mothers and based on their response questionnaire was framed in order to correct unclear questionnaire during scheduled visits from 3-4 times a week , the questionnaire was prepared by three experts with public Health Care Center and was validated it interviewed by some colleges in the same field .Completed questionnaire were collected at the following vistas at total 300 mothers survey in four months from April to July 2018 , knowledge about various vaccines according to the National vaccination program offered by the Iraq Ministry of Health , Mother responses were measured on Likert Scale that is consisted of Yes /No , do not know choice , evaluated mothers knowledge by summing their correct answer to 7 questions (1 point per correct answer ) .Mother knowledge was evaluated a poor (scoring 0-2 points ) , average ( 3-4 points), or good > 5 points .Statistical analysis was performed using SPSS software version 20.0 . The questionnaire was designed in English and translated to Arabic by the doctors , it comprises demographic and socio- economic questions, questions on perceived adverse effects of immunization and source of information, questions testing of childhood immunization , aim , duration of protection , severity of diseases prevented age at start program .

Results :

Among the selected mothers were (120(40%) at the age (26-30) years old and 30 (10%) at age(20-25) years old as in table 1 .Table (2) , shows the distribution of samples according to education level , the percentage of samples according to education level , the percentage of mothers were higher among primary education , compared with low percentage of mothers of university education 25(8.3%) .Table 3 , shows distribution of participated according to source of information were 150 (50%) of mothers had received information from medical workers , while 50(16.6%) of mothers received from internet and 100(33.3%) from family and friends .Table (4) shows mothers knowledge regarding vaccines , most respondents(83.3%) considered vaccines should be given from the birth , but only (16.6%) of them considered the side effects of vaccines to be dangerous ,number of mothers (75%) knew the places of vaccination at public health center , and (33,3%) of mothers satisfied that vaccines have any side effects while number of respondents (50%) knew that vaccines are available today in Iraq population .Table (5) , show distribution of studied sample about contraindication o vaccines very low numbers of respondents (16.6%) were believed the common cold of child is contraindication o vaccine and (8.3%) of mothers considered that ever is contraindication , while (6.6%) of respondents were considered the diarrhea is contraindication for vaccination. Table (6), shows the distribution of samples according to knowledge regarding reasons for incomplete vaccination were (66.6%) of respondents know that vaccines was not available , while (8.3%) of them identified that family problem as the reason or incomplete vaccination.

**Table (1) :Distribution of studied sample according to age (yeas) , (N=300)**

| Variable | N | % |
|---|---|---|
| Age (years) | | |
| 20- 25 | 30 | 10% |
| 26-30 | 120 | 40% |
| 31-35 | 100 | 33.3% |
| 36-40 | 50 | 16.6% |

**Table (2) : Demographic characteristics o the studied sample according to Education level ,(N=300)**

| Variable | N | % |
|---|---|---|
| Primary Education | 125 | 41.6% |
| Secondary Education | 100 | 33.3% |
| University Education | 25 | 8.3% |
| Nil | 50 | 16.6% |

**Table (3): Distribution of samples according to source of information ,(N=300) .**

| Variables | N | % |
|---|---|---|
| Family & Friends | 100 | 33.3% |
| Medical workers | 150 | 50% |
| Internet | 50 | 16.6% |

**Table (4):Distribution of studied sample according to their general knowledge about vaccines,(N=300) .**

| Variables | Yes | No | Don't know |
|---|---|---|---|
| Vaccines are available today in Iraq population | 150(50%) | 50(16.6%) | 100(33.3%) |
| Do you think that vaccines have any side effects | 100 (33.3%) | 150 (50%) | 50(16.6%) |
| Are side effects of vaccines dangerous | 50(16.6%) | 200 (66.6%) | 50(16.6%) |
| Childhood vaccination prevent life –threatening diseases | 200(66.6%) | 50(16.6%) | 50(16.6%) |
| The places for vaccination include public health center | 225(75%) | 25(8.3%) | 50(16.6%) |
| Allowing non immunization children to sent to school | 200(66.6%) | 50(16.6%) | 50(16.6%) |
| Vaccines should be given from birth | 250(83-3%) | 25(8.3%) | 25(8.3%) |

**Table (5): Distribution of selected sample according to knowledge of vaccines regarding the contraindication of vaccines , (N=300)**

| Variables | Yes | no | Don't know |
|---|---|---|---|
| Child with common cold be vaccinated | 50(16.6%) | 150 (50%) | 100 (33.3%) |
| Child with fever be vaccinated | 25(8.3%) | 200(66.6%) | 75(25%) |
| Child with diarrhea be vaccinated | 20(6.6%) | 200(66.6%) | 80(26.6%) |

**Table (6): Distribution of studied sample according to knowledge regarding vaccines for incomplete of vaccination ,(N=300)**

| Variables | N | % |
|---|---|---|
| Mother was too busy | 75 | 25% |
| There was a family problem | 25 | 8.3% |
| The vaccines was not available | 200 | 66.6% |

## Discussion

The distribution of mothers demographic characteristics had revealed that the majority (40%) of them were of (26-30) years old and (41.6%) primary education , in the current study it is clear that medical workers were the main source of information need to be utilized to provide proper education program about vaccination , this result is lower than what is found by knowledge A,et al , 2011 [11] .in United States (81.7%) of mothers consider medical workers as main source of information toward vaccination . In the present study regarding the knowledge about vaccines , 50% of mothers agreement that vaccines are available today not considered that vaccines have any side effects on comparing with another study conducted by Zagminask ,2007 [12] ,(57.0%) of surved mothers considered that vaccines have any side effects , high percentage o respondents (83.3%) agree that vaccines should be given from birth , this is higher than results done by Iron Tam PY, 2009 [13](76%) of them agree that vaccines give from birth but in the present study (75%) of the respondents agree that public health center is the main place for vaccination ,this higher than the results done by Suryadeva , 2013 [14] ,(50%) of mother agreement that public health center is the main place for vaccination (66.6%) of respondents believed that vaccination prevent lie threatening diseases , this similar results done by Mahlingam S,(2014), [15] ,60% of mothers agreement that vaccination prevent life threating diseases. In the present study regarding contraindication vaccines, most respondents (66.6%) not considered that fever and diarrhea diseases are contraindication about vaccines but result done by Abubaker IE,2017 [16] were 61.7% of participated parents considered the fever and diarrhea are contraindication for vaccines .

The current study shows knowledge of mothers regarding reasons for incomplete vaccination ,(66.6%) of respondents believed that vaccines not available , this slightly higher result done by Vinod kumar M,2017 [17] ,50% participate considered that vaccines not available are to reason o incomplete vaccination .

## Conclusion

Evaluation of mothers knowledge toward children's immunizations is the tool for good communication between health professionals and parents ,the medical workers are the main source of information about vaccination , the majority of mothers do not have comprehensive information routine vaccination schedule .

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Medical Institute Baghdad and all experiments were carried out in accordance with approved guidelines.

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# Effect of Corrective Exercises According to the Biomechanical Indicators of the Footprint of the Paraplegic

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## Abstract

The value of scientific research depends on the type of data and the accuracy and quality of the devices used in these devices and foot scanner (foot scan), a device for the analysis of walking movements and helps in the detection of the values of many variables of the amount of pressure and the deviation and deviation of the foot and direction and time of contact and the extent of benefit Of these variables in the identification of errors and the development of appropriate exercises appropriate to them and this is what the importance of research as a serious attempt to identify the current mechanical situation of this category of disabled and study the details of this case and the problem of research is the lack of appropriate corrective exercises and the objective of the research to design corrective exercises and knowledge of their effect on some values of the biomechanical variables of the footprint at a speed of (2 km / h). Corrective exercises Led to an improvement in the level of walking of the sample by the development of the values of the variables investigated.

***Keywords:*** *Biomechanical indicators , print foot, paralysis.*

## Introduction

The specialty design of special corrective exercises on the scientific map in the area common between the science of biomechanics and medical science and know that these exercises [1] , which are developed to address a clear line identified by the trainer or The real performance for the purpose of correcting the motor path of the same skill [2], but it is developed to avoid errors and install the correct performance and from this premise and concept must be observed the conditions of the special exercises of the use of scientific observation [3], that requires accurate use of modern technical equipment to reach to diagnose mechanical sound errors and then think of appropriate solutions [4]. Jogging can be considered a simple and difficult process at the same time because it is simple because it is one of the only repetitive movements and difficult because of the mechanical complexities where we cannot find two runners[5, 6], the running in the same way and can be defined as a feature characterized by the human and designed by the person according to the length and habits of the lower end In jogging , the overlap of muscle work and the synchronization or timing of joint movements illustrate the collective work of the movements of the body as a whole. The Jogging is a typical example of the flexibility of kinetic control provided by the brain and kinematics in the regular (angles, distances and speed) [7] , This flexibility of nerve control is very important for the therapist's natural observations to compensate for the patient's lack [8] . The result of course is not known because the use of these exercises was scheduled from the medical point of view do not care about jogging steps on the basis of sports is not enough [9] , We must determine the nature of mechanical work in advance so that the researcher is a picture of what work to be done and calculated and accurately and away from random work, It is only known that the value of scientific research depends on the type and accuracy of the data. These devices are the( gait analysis), which is a device for analyzing walking movements and helps In the detection of the values of many variables of the amount of pressure and force and the deviation and deviation of the foot and direction and time of contact and the extent of benefit from these variables in the identification of errors and the development of appropriate exercises appropriate to them and this is what the importance

of research as a serious attempt to identify the current mechanical situation of this category of disabled and study the details of This situation is exploited by modern scientific instruments and tools to identify the strengths and weaknesses that[10,11] , If compared to the test of the proper performance will provide a scientific basis and a basis for the diagnosis of errors and on the basis of which are built special exercises without ignoring any of the important aspects of mechanics performance, as well as revealed the relationship between the steps walking and jogging, which makes them a new step to build training curricula with the highest efficiency and to reliance on accurate values showing the priorities of the variables that must be included in the curriculum in the future [12,13].

## Materials and Method

The researcher used the experimental method in the one-group model with the comparison of the test (the natural data of the footprint). "Experimentation is a deliberate and precise change of the specific conditions of an event and observation of the resulting changes in the event itself and its interpretation [15] ,The researcher used the field observations of two of the infected patients attending in physical education and sport science faculty/ Kufa university, for the measure some biomechanical indicators of the footprint at a speed of (2 km / h) as tribal observations compared to similar distance observations [16] . A report on the mechanical variables, which (Zebris Medical GmbH) produces, is produced in the form of a table that includes these variables, their values and both feet.

**Table (1) show the mean and standard deviations of physical characteristics of students who they participate in this study were not significantly different in both right and left foot rotation.**

| Variant name | | | Pre-test | | Post test | | t.test | Sig | Type sig |
|---|---|---|---|---|---|---|---|---|---|
| | | | M | SD | M | SD | | | |
| Foot rotation Deg)) | | R | 14.850 | 7.563 | 12.600 | 4.502 | 1.569 | 0.177 | No sig |
| | | L | 9.217 | 15.177 | 8.217 | 5.987 | 0.225 | 0.831 | No sig |
| Gait line length, (mm) | | R | 152.33 | 35.382 | 115.33 | 14.86 | 3.212 | 0.024 | Sig |
| | | L | 141.16 | 57.953 | 104.66 | 35.82 | 6.036 | 0.018 | Sig |
| Contact time% of stance time | Fore | R | 97.367 | 4.127 | 91.100 | 4.127 | 4.527 | 0.006 | Sig |
| | | L | 97.683 | 1.689 | 1.689 | 4.803 | 4.659 | 0.006 | Sig |
| | mid | R | 81.167 | 5.351 | 71.283 | 5.929 | 2.861 | 0.035 | Sig |
| | | L | 78.683 | 6.302 | 68.883 | 12.306 | 1.794 | 0.133 | No sig |
| | heel | R | 66.467 | 11.538 | 59.967 | 15.044 | 0.779 | 0.471 | No sig |
| | | L | 58.767 | 15.004 | 45.850 | 21.844 | 3.201 | 0.018 | Sig |
| Max force, N | fore | R | 456.733 | 84.042 | 519.450 | 193.303 | -1.015 | 0.357 | No sig |
| | | L | 313.267 | 228.225 | 503.467 | 297.770 | -1.360 | 0.357 | No sig |
| | mid | R | 186.633 | 62.967 | 252.433 | 74.140 | -1.792 | 0.133 | No sig |
| | | L | 224.283 | 102.754 | 466.400 | 349.929 | -2.495 | 0.051 | Sig |
| | heel | R | 144.900 | 41.917 | 194.033 | 59.605 | -3.510 | 0.017 | Sig |
| | | L | 153.383 | 58.219 | 199.867 | 83.688 | -1.775 | 0.136 | No sig |
| Max pressure, N/cm^2 | fore | R | 13.317 | 3.372 | 15.767 | 2.776 | -2.533 | 0.042 | Sig |
| | | L | 12.183 | 3.263 | 16.283 | 7.035 | -2.484 | 0.046 | Sig |
| | mid | R | 7.883 | 62.967 | 252.433 | 2.188 | -1.564 | 0.179 | No sig |
| | | L | 11.567 | 3.160 | 12.433 | 3.160 | -2.304 | 0.093 | No sig |
| | heel | R | 8.367 | 2.487 | 8.583 | 1.162 | -1.210 | 0.280 | No sig |
| | | L | 8.733 | 3.829 | 10.033 | 3.575 | -3.574 | 0.016 | Sig |

## Result and Discussion

This work makes the center of the body undergo a rotational and rotational transmission . In this sense, the sensors of the foot scanner record the length of the foot line as a reaction What happens in the center of gravity is not arbitrary but depends on The mechanical motor chain which acts simultaneously between the two extremities of the body. The safety of this work is evident in the work of the soles of the foot [18] , which carries a center that carries the body and moves towards the next step. This transition is under mechanical conditions to ensure the proper transition. On specific points in the soles of the foot and any defect in the step will lead to imbalance in the process of mechanical balance.

The results of analysis of Gait line length revealed significant values in both right and left , this is evidence that the sample of the research a new form or style at this speed so that the search sample became pressure on the foot more, as the movement of the foot and moving from the heel to the foot became the length of the pressure line longer in the right foot and explain this researcher the change that special exercises have affected the work of the muscular nervous so that there is a use of a greater focus on this foot and this has to do with the forced rhythm exercise that was subjected to the sample, this exercise has earned them a good rhythm of the movement starts from slow to faster on the other hand [(19, 20),] Foot than it used to be the soles of the use of welded larger and this is between the results of the statistical analysis. Comparing this increase in the length of the foot line with the data from a foreign study shows that this increase is evidence that the research sample began to touch the ground more, which leads to the drawing of a new line different from the previous increase in the search for the correct use of the soles of the foot It is considered one of the most important indicators of the transmission of the foot line equally on the three foot parts (heel foot - made foot - fore foot) [21] , if this line passes through the three areas and the principle of distribution of the right as this study concluded that the shortness of this line is evidence of disorder in use Foot and so be clear when giving different forms of this line from the normal shape [22] . The study of scientific experiments and research in this field shows that there are areas that pass this line, which is ideal for the work of the foot as well as detail the length of the line according to areas of transmission on the surface of the foot if the line passes areas identified in the form indicated the good use of foot because this the line moves on areas where the foot pressure occurs [23] .

Contact time of stance time, As for the variable foot contact, which showed significant differences time in favor of the post test shows that this variable on a great link to the previous variable (line foot length) One of them is linked to the other and close association, the researcher believes that it makes sense when it increased the length of the foot line, it is indicated by increasing the length of build and pressure distribution is greater distance, and this process certainly need a longer time than the previous when the line is shorter [24] , and shows the ratio of length of the line to be based on time, and this is further evidence that the sample began using the soles of the foot full form and without delay and explains, The researcher said that the exercises ware aimed at rhythm [25] , they had a clear impact in improving the way the foot placed during the movement, which led in turn to adjust the way the transfer of the center of gravity which prints that pads of the foot on the ground, and remember one associated with this subject that studies the movement process is composed of 35% of likely for both men and 65% fulcrum distributor the foot is connected to the ground by the heel, the first with the tendon of the instep slightly outward, with a small rotation outside the hip joint.

As for the highest amount of force, there was a difference in the front of the foot right and the level of significance. The researcher explained this because the results of the tribal test had abnormal values at this particular speed. When compared with the results of the post-test, there was an improvement of the body side without any other, knowing that this improvement was not related With the amount of force above ,Among the variables that recorded a change and the test's favor is the highest amount of force [26] ,The magnitude of the change in force is illustrated by the fact that in the post-test, the starting point of the force indication is equal and the shape of the curve has a clear peak than the tribal test, and here is an important indicator that there is a kind of laxity in the force quantities. These exercises lead to the opening of new nerve paths in the cortex of the brain.

## Conclusion

Through the application of corrective exercises, the

researcher reached a set of conclusions which are as follows, The higher the speed of running, the longer the pressure line and the contact time of the three parts of the foot and this indicates an improvement in the work - nervous - muscular and the biggest focus in the tribal test corrective exercises directly affected the amounts of forces that the foot on the belt of the car more than the tribal test, and this indicates that the sample of the study possessed a different program of locomotives than before.

The amount of power exerted by the two men is affected by changes in velocities, in a systematic manner and coordinated with the requirements of performance. The curves of pressure and strength become more similar between the two extremities of the body and this indicates that the research sample became the distribution of neuromuscular work closely between the ends of the body, unlike the tribal test in which the sample depends on the right side much more than the injured side.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the University of Kufa and all experiments were carried out in accordance with approved guidelines.

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# Effects of Caring Children with Leukemia on their Mothers` Psychosocial Status

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## Abstract

**Study aim:** to assess the influence of care burden for children with leukemia on their mothers` psychosocial status.

**Methodology**: A Descriptive study, conducted at two pediatric hospitals in Baghdad city. A purposive sample of (60) mothers was participated in the study after obtaining their consent form. The instrument of the study was used to assess mothers` psychosocial status in addition to their sociodemographic characteristics. The data was processed and statistically analysed by SPSS program version 23.

**Result**: the result of the study showed mothers have (81%) in self esteem, (77%) in psychosocial distress, (80%) for social interaction, and (76%) for social isolation. There were association between mothers` psychosocial status and their age, educational level, and occupation.

**Conclusion:** the result of the study concluded that mothers of leukemic children have generally accepted level of psychosocial status except they isolated themselves.

***Key words****: psychosocial status, Children, Leukemia, effects*

## Introduction

Childhood cancer is a widely public health problem because of its negative influence on family and society. Leukemia is most common types of childhood cancers under 15 years of age, which represents 25% of all cancer in children. Like other terminal illness, it may cause several physical and mental problems for caregivers. Parents of leukemic children might experience various levels of anxiety and disappointment especially during initial stages of the diagnosis of their children [1, 2, and 3]; Mothers of children with cancer have participated in some educational programs that focused exclusively on improving child's health outcomes with less attention toward the needs of the caregivers. However, most mothers of leukemic children have psychosocial needs, which to be better if addressed in order to improve their general health status and provide best care for their children at home [4]. As reported in several studies that mothers of children with chronic diseases may suffer from different negative psychosocial consequences [5]. Parents of children with leukemia challenged many effects of the disease and its burden. In addition to the cost of additional health care services with a long term follow up. In addition, theses concerns require more action on the part of parents in order to identify children's social and academic needs [1, 6]. Park, et al (2016) conducted a study that showed psychosocial status depressive symptoms and worse quality of life in parents of children with advanced cancer [7].

## Methods and Materials

**Research design:** A descriptive study conducted at oncology units in pediatric hospitals; data was collected from November 1st 2018 to May 8th 2019.

**Setting:** The study was carried out at two pediatric teaching hospitals: child central pediatric teaching hospital and welfare pediatric teaching hospital in Baghdad city.

**Instrument of the study and procedure:** The

questionnaire was developed on the basic of are view of the literature and the opus groups of parents. The questionnaire format was consisting of two parts : the first part is demographic data related to the mother, and the second part is related to the psychosocial effect of hospitalization on mother of children withleukemia in oncology units. The researchers using question that reflect mother behaviors (assessment to psycho and social characteristic ) that observed by parent. The answers were scored 1,2,3,4, and 5 (never , rarely very , sometimes ,most of the time ,every time) respectively. Validity of the instrument was coducted after experts reviewed and content validity was established. Furthermore, changes were made in questionnaire items according to the recommendation and notes of experts. The reliability of instrument was r= 0.83 at the level ($p \leq 0.05$) which was statistically acceptable.

## Statistical Analysis

SPSS programme version 23 was used, frequency, percentage, and mean used in data analysis.

## Results

41%of mother their ages are between (35-44), 25%graduated for secondary school and 66%of mother their housewife according to their child demography data 42%of children have age between (10-12) years, 42% children 3-5 years age of onset disease, 60%of child male and 50%child first order in family.

**Table 1. Mothers` psychosocial dimensions**

| List | Psychosocial dimensions | Mean | Percent |
|---|---|---|---|
| 1 | Self –esteem | 4.08 | 81% |
| 2 | Psychological distress | 3.85 | 77% |
| 3 | Social interaction | 4.01 | 80% |
| 4 | Social isolation | 3.84 | 76% |
| Total | | 3.94 | 78% |

This table shows the mother response to psychosocial dimension and there is a High level in self esteem dimension and mean 4.08 Social interactions at mean 4.01, psychological distress at mean 3.85, and social isolation at mean 3.84 respectively.

## Discussion

The results of the present study showed that 41%of mother their ages are between (35-44), 25%graduated for secondary school and 66%of mother their housewife according to their child demography data 42%of children have age between (10-12) years, 42% children 3-5 years age of onset disease, 60%of child male and 50%child first order in family. This result supported by the study conducted by Mahmoud and Elaziz (2015) it showed that the majority of caregivers' age is between (25-40) years old. Also, they found that most of caregivers were mother half of than are housewife. However, the study result supported that mothers of children with leukemia are more worthy to take care of their sick children than other family member [6]. Also, the study result shows that there is a high level of psychological and social stress among mothers of leukemia children when they response to psychological stress scale. This result consistent with the result of the study conducted by Creswell, Wisk, Litzelman, Allchin, and Witt (2014) that showed caring of children with advanced cancers was associated with increased to the diagnosis with relevant depressive symptoms in parents [7]. The findings of this study supported that mothers of children with cancer have high a high level of psychological and social stress. Many studies suggested that there are significant difference in the levels of stress, depressive, and anxiety among parents of children with cancer [8,9]. Parents' psychosocial status would affect by their children health conditions and the procedures of treatment of leukemia in the pediatric hospitals. Also, psychosocial status includes depressive symptoms like level of sadness, anxious, feeling of hopelessness, decreased energy, feeling of guilty, restlessness, and insomnia [9]. In addition, psychosocial status of mothers concerns their children with leukemia has a critical impact on their children's health status and other family members. However, parents of children with cancer need additional psychosocial interventions that would provide the necessary support during treatment periods [10].

The present findings showed that mothers of children with leukemia have a high level in their self-esteem dimension during provide care for their children in the oncology units. Steiner, Shlonsky, and Joubert (2017) found that parents of children with end-stage cancer need additional psychosocial interventions services in order to increase child-parent communication and their coping skills to promote parental psychosocial wellbeing [(11)].

The study result showed that there is an association relationship between mothers' psychosocial level and their demographic characteristics; correlation was significant at the level of 0.05. This result consistent with the result of a study conducted by Bemis et al., 2015 that reported most socio demographic variables for mothers of children with cancers were positively correlated with all level of stress and depressive symptoms [(17).]

## Conclusion

The level of psychosocial status of mothers of children with leukemia showed acceptance and they have a high level of stress also all caregivers have stress of at different. However, there is an association between mothers' psychosocial level and their demographic characteristic such as mother age, educational level and occupational status.

## Recommendation

Based on the study results, the study recommended:

1- Social institutions should provide psychosocial interventional programs for parents of children with leukemia to reduce the stress in the family and intervention programs to provide the information about coping strategies to help the families deal with the problem.

2- Activating the role of psychiatric nurses and social worker in pediatric hospitals in order to help families of children with leukemia to decrease the level of stress during their attendance to the hospital.

**Conflict of Interest:** The researchers report no conflict of interest.

**Funding:** This study did not receive any funding from any agency.

**Ethical Clearance:** A permission to conduct this study was obtained from the ethical committee in the college of nursing at University of Baghdad.

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# Social Factors associated with Relapse in Psychotic Patients Attending Teaching Hospitals in AL-Furat Al-Awsat Governorates

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**Abstract**

**Background**: The relapse in mental disorders is extremely painful and costly for the patient and his family as well as for the community. These frequent readmissions are strain on the health institutions and on the Ministry of Health Budget.

**Objectives:** To find out the relationship between the social factors of relapse and sociodemographic data of psychotic patients attending teaching hospitals in AL_Furat Al-Awsat Governorates.

**Methodology:** The design was (Descriptive-Correlational) used to describe the variables and the relationships that occur among them in this study. The sample was (a non-probability) purposive of (181) relapsed psychotic patients were selected from our patients centers from teaching hospitals in AL_Furat Al-Awsat Governorates, during the period from 9th May 2019 to 20th August 2019. The instrument included two parts: sociodemographic variables and the social factors associated with relapse. The researcher used descriptive statistics tools such as frequency, percentage, mean of score and used in inferential statistics such as Chi-Square.

**Results:** The findings of the study indicate that (45.86%) of the sample their diagnosis was schizophrenia, (25.97%) were schizoaffective and (11.60%) were major depressive disorder with psychotic features. Also, the findings of the study indicate that (58.6%) of the study samples they have poor social factors, while (24.3%) they have moderate social factors and (17.1%) they have good social factors.

**Conclusion:** There is a high significant relationship between the most sociodemographic data and social factor (that included family support and financial factors).

***Keywords:*** *Social Factors, Relapse, Psychotic patients.*

## Introduction

According to the American Psychiatric Association (APA), the mental disorder defines as a health state described by high dysfunction in-person behavior, emotions, cognitions or that reflect a disorder in the psychological, biological or developmental processes following mental functioning [(1)]. Relapse is recurrent through the beginning years of the disease which may be associated non-compliance to treatment and regain symptoms that lead to an increase in the danger of relapse more than 5 times. The occurrence of relapse with psychotic patients living with their families depends largely on follow-up, how to treat and what the family provides them [(2)]. Psychotic relapse is the recurrence of treated psychotic symptoms and causes the patient's condition is deteriorating and cause hospital readmission [(3)]. Can be serious outcomes for clients and families during relapse at an early phase of psychosis. The functional outcomes consider the most visible result of relapse and there is have a relation with interruption of remission. The most important predictor of functional consequences (social relationships, employment, and school) length of remission join negative and positive

symptoms which have been shown to be by far at 1- and 2-years follow-up of patients with early-phase psychosis [4]. The major goals and challenges to the client and their families were relapse prevention [2]. Relapse may be poor to affect their consequences for a long time and affect social interaction and occupational growth. Analyzes indicated that the treatment of relapses of psychosis would be very costly and estimated to be four times the cost of care for individuals without relapse [5].

## Objectives

1. To assess the type of diagnosis with most relapse rate.

2. To identify the social factors that contributes with most relapse clients.

3. To find out the relationship between the social factors of relapse and sociodemographic data of psychotic patients.

## Methodology

ü **Design of the study**: A descriptive-correlational was used to describe the variables and the relationships that occur among them in this study. This design was carried out to accomplish the aims of this study using assessment method on psychotic patients attending the out patients clinic of teaching hospitals in AL_Furat Al-Awsat Governorates, during the period from 9th May 2019 to 20th August 2019.

ü **Sample of the study**: The sample was (a non-probability) purposive of (181) relapsed psychotic patients were selected from teaching hospital out patients center in AL_Furat Al-Awsat Governorates.

ü **Study instrument**: A questionnaire was created by the researcher to reach the study objectives. A large body of relevant literature were extensively reviewed to find the appropriate tool for the current study.

All the instrument domains are measured and rated on three levels rating as a 3-point Likert scale from 1 to 3 respectively; 1 indicates never, 2 indicates sometimes, and 3 indicates always.

The social factors associated with relapse of patients with psychotic illnesses are determined based on the mean of items scores. Effect levels of these domains were measured as follow:

- (Low effect = 1-1.66(
- )Moderate effect = 1.67-2.33(
- )Sever effect =2.34-3).

ü The instrument included two parts: sociodemographic variables and the social factors associated with relapse.

**Part1: The Socio-demographic information**:

This part includes: (gender, age, age at diagnosis, duration of disease, level of education, social status, occupation, monthly income, type of living, residence, family type, who give care to the patients, number of relapses, admitted to the hospital, type of diagnosis).

**Part 2: Social Factors associated with relapse:**

Includes the association social factors with psychotic patients relapse:

Ø **Social Factors**: consists of (18) items, divided to (2) domains:

· Family support (10 items).

· Financial factors (8 items).

**Data Analysis**: The results of the study were analyzed and assessed using the Statistical Package for Social Sciences program (SPSS, Version 26). The researcher used descriptive statistics tools such as frequency, percentage, mean of score and used in inferential statistics such as Chi-Square.

## Results

**Table 1: Descriptive the samples according to types of diagnosis**.

| Diagnosis | f | % |
|---|---|---|
| Schizoaffective | 47 | 26 |
| Schizophrenia | 83 | 45.9 |
| Major depressive disorder with psychotic features | 21 | 11.6 |
| Bipolar Disorder | 16 | 8.8 |
| Delusional Disorder | 6 | 3.3 |
| Postpartum Psychosis | 5 | 2.8 |
| Substance/medication-induced psychotic disorder | 3 | 1.7 |
| Total | 181 | 100 |

This table shows (45.9%) of the sample their diagnosis was schizophrenia, (26%) were schizoaffective and (11.6%) were major depressive disorder with psychotic features.

**Table 2: Social Factor associated with relapse of psychotic patients.**

| **No.** | **Factors Domains** | | |
|---|---|---|---|
| **1** | **Levels (Social Factors)** | **F.** | **%** |
| 1 | Good | 31 | 17.1 |
| 2 | Moderate | 44 | 24.3 |
| 3 | Poor | 106 | 58.6 |
| | Total | 181 | 100 |

This table shows as regarding social factors, the study samples (58.6%) they have poor social factors, while (24.3%) they have moderate social factors and (17.1%) they have good social factors.

This table shows that there is a highly significant relation in (gender, age, duration of disease, social status, occupation, monthly income, family type and who give care to the patients) with (Social factors) at p **£** 0.05. While this table shows that there is non-significant relation in (age at diagnosis, level of education, type of living, residence, number of relapses and admitted to the hospital) with (Social factors) at p > 0.05

## DISCUSSION

The results shows that (45.9%) of the study samples have schizophrenia, (26%) have schizoaffective and (11.6%) have major depressive disorder with psychotic features. (Table 1). This result comes with (fikreyesus, et al.,2016) they found that (72.5%) have schizophrenia, (14.2%) have brief psychotic and (13.3%) have schizophreniform and schizoaffective [(3)]. Also, this result was agree with (Hui C, et al, 2013) who found that nearly one-fourth (n = 70) of respondents with diagnosis of schizophrenia had relapse [(6)]. This is due to the fact that first episode psychosis showed that the diagnosis of schizophrenia was associated with high risk of relapse and elevated severity level, also the nature of the disease according to previous studies, is more severe and less responsive to treatment and suffer many relapses.

The social factors included (family support and financial factors). (Table 2). The result of our study shows that (58.6%) of the study samples they have poor social factors, while (24.3%) they have moderate level of social factors and (17.1%) they have good level of social factors. This result may be due to the fact that psychosis increases the family burden because of the difficulty of dealing with the patient and their refusal to take the medication prescribed by the doctor often, and also revealed that the lack of adherence to treatment is because of the high cost of the drug and the weak economic situation of the families and caregiver can't buy it, so these families leave treatment and use of other incorrect methods of dealing with this disease.

The result also shows that there is a high significant relationship in social factors with gender at p value (.000). This result was disagree with (Hussien, et al., 2008) they found non-significant relationship between factors related to family and gender [(7)]. This result may be because our community thought about stigma especially with female patients which lead them to keep them in the home instead of sending them to the hospital.

The result shows that there is a high significant relationship in social factors with age at p value (.000). (Table 3). This result was disagree with (Hussien, et al.,

2008) they found non-significant relationship between factors related to family and age [7]. This is because most of the samples in the study were between the ages of 38-47 years who were significantly affected by social factors.

The result shows that there is non-significant relationship in social factors with age at diagnosis at p value (.080). (Table 3). This result was agree with (Hussien, et al., 2008) they found non-significant relationship between factors related to family and age at diagnosis [7]. This is because that psychotic disorder often significant appears earlier in men than in women, and the patients are generally affected in the twenties to early thirties years of old.

The result shows that there is a high significant relationship in social factors with duration of disease at p value (.001). This result may be due to the fact that the short duration of the disease will lead to poor adaptation to the disease because of the difficulty acceptance of the illness by the patient and the family, since most of the samples in our study were from the duration of the disease (1-4 years) which is the shortest duration in the study so, we see the majority of social factors are significant affected by the duration of the disease.

The result shows that there is non-significant relationship in social factors with level of education at p value (.270). This result was agree with (Hussien, et al., 2008) they found non-significant relationship between factors related to family and level of education [7].

The result shows that there is a high significant relationship in social factors with social status at p value (.001). This result was disagree with (Hussien, et al., 2008) they found non-significant relationship between factors related to family and social status [7]. This is due to the reason most patients in the study were separated and more likely to relapse for several reasons, including the loss of help and loss of independent and the loss of hope for healing through treatment, leading the patient resort to witches and charlatans.

The result shows that there is a high significant relationship in social factors with occupation at p value (.000). This result was disagree with (Hussien, et al., 2008) they found non-significant relationship between factors related to family and occupation [7]. While this result was agree with (Chaurotia, et al, 2016) they found that unemployment was more significant relapse group with unemployment [8]. This result may be due to the support of most studies to the real fact that the lack of a job leads to the poor economic status of the family and therefore the family is inability to buy treatment and thus relapse of the patient and persistence of his poor condition.

The result shows that there is a high significant relationship in social factors with monthly income at p value (.000). This result was disagree with (Hussien, et al., 2008) they found non-significant relationship between factors related to family and monthly income [7]. This result may be because of patients' dependence on their family and may be due to the fact that low level of employment leads to lower income for the patient's families, which can lead to poor attendance in the hospital as well as the poor economic status of the families, which has led to the lack of support for their patients and consequently recurrent relapse [9].

The result shows that there is non-significant relationship in social factors with type of living at p value (.643). (Table 3). This is due to the fact that most of the study sample live with their families like parents or brothers and most of them have housing so there is no relationship with the high rate of relapses.

The result shows that there is a high significant relationship in social factors with family type at p value (.001). These results were disagree with (Hussien, et al., 2008) they found non-significant relationship between factors related to family and family type [7]. This is due to the fact that most of the study samples live with single families and isolated from any social communication and these families are very interested in the secrecy of their son's illness and this is one of the reasons that has a role in the recurrence of the patient's relapse.

The result shows that there is a high significant relationship in social factors with who give care to the patients at p value (.004). This result was disagree with (Hussien, et al., 2008) they found non-significant relationship between factors related to family and person responsible for the patient [7]. This result may be due to the fact that all the previous studies support that the psychiatric patient, especially in psychosis, needs to be followed up by the family, but most of the samples in this

study were followed by their brothers, so the brothers were the main reason for the recurrence of relapse due to poor follow-up and neglect and not to give them treatment and the adoption of incorrect methods and far from treatment, such as witches and charlatans.

The result shows that there is non-significant relationship in social factors with number of relapses at p value (.195). This result was disagree with (Hussien, et al., 2008) they found a significant relationship between factors related to family and number of relapses [7].

The result shows that there is non-significant relationship in social factors with admitted to the hospital at p value (.290). This result was agree with (Hussien, et al., 2008) they found non-significant relationship between factors related to family and type of admission [7]. This result may be due to the fact that psychotic patients who weren't compliant to treatment do have increased risk for violence. This is due to the result of most of the patients in the study who violently violated them before admitting to the hospital and receiving treatment for the first time and very affecting their social relationships, especially if the target of the violence is the employer or a family member, friend or teacher and husband. Therefore, most families are forced to bring the patient for not tolerating the harm of the patient to others. Family use in this manner increases the severity and relapse of the illness.

**Conclusions:**

The majority of samples were diagnosed with schizophrenia. The greater of samples were among the most affected factors in the study were poor social factors. There is a high significant relationship between the most sociodemographic data and social factor (that included family support and financial factors).

Recommendations:

**1.** AL_Furat Al-Awsat region: It is a large area where educational hospitals are available, but it is free of Psychiatric Units that psychiatric patients need treat patients in those area.

**2.** Educate patients families and society about accepting mentally ill as a member in the society and give education about how to deal with stress and home care for patients.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Psychiatry and Mental Health Nursing and all experiments were carried out in accordance with approved guidelines.

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# Linkage between Cariogenic Streptococcus Mutans and Atherosclerotic Plaques of Cardiovascular Disease Patients in Iraqi Population

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## Abstract

This study was done to identify the correlation between cariogenic S. mutans and CVD patients of Iraqi population.

**Materials and Method:** Eighty six cardiovascular Iraqi patients between (24-70) years old were investigated for their association with cariogenic S. mutans. Pathological samples of vascular and heart valve biopsies and atherosclerotic plaques from the catheter tips of the diagnostic and therapeutic catheters of CVD patients were analyzed with molecular PCR technique with two types of primers, 16s universal primer and S. mutans serotype-specific primer sets genotyping was performed to determine the linkage between cariogenic S. mutans and CVD patients in Iraqi population.

**Results:** DNA samples of cariogenic S. mutans was specified in 60 / 86(69.7%) of the enrolled cardiovascular disease patients, distributed according to the gender between 42/60 (70 %) in males and 18/60 (30%) in females and according to the age between 33/60(55 %) of the positive patients were at 24-60 years and 27/60 (45 %) of the positive patients were > 60 years old.

***Keywords:*** *Cardiovascular disease, Biofilm, Cariogenic Streptococcus mutans, PCR; Universal 16S ribosomal-RNA and Serotype-specific primers genotyping.*

## Introduction

Cardiovascular diseases are the major etiological causes of both weakness and mortality in numerous developing and developed countries, It is expected that during the next time, heart diseases will be the direct cause of fatality in human being [(1)]., Cardiovascular diseases are the reason of approximately 40% of mortality in Europe each year and they killed over 3.9 million people, the bulk of deaths were due to heart disease and stroke [(2)]. Cardiovascular diseases refer to many different illnesses that attack the heart muscle, blood vessels and valves due to biofilms formation, atherosclerotic plaques, very broad etiological agents involved in these diseases including factors such as age, sex, and diet [(1)] . Biofilm are considered as accumulation of microbial masses that adheres to solid surfaces in dental plaques or intravenous catheter or as synergistic with polysaccharide matrix in extracellular. About 65% of infections in human are because of formation of microbial biofilms [(3)]. The biofilms are created by original adherence of bacteria to a solid surfaces, progress of a multi-dimensional intricate structure and disinterest to development in other place. The greatest example of biofilm development is dental plaques which lead to dental caries, periodontitis and other associated systemic disorders. [(5)]. Despite of the high diversity of the human oral microbiota, and its close contact with the circulatory system, various bacteria are implicated in biofilm formation, Streptococcus mutans is the fundamental pathogen in oral cavity which is causal factor of dental plaques and dental caries, considered the most common diseases throught the world [(6 , 7)]. This pathogen which pass through the bloodstream may results in infective endocarditis [(8-9)]. Many previously studies recorded that periodontopathic bacterial species, as well as several Streptococcal species, were specified in cardiovascular specimens like heart valve and atheromatous plaque, and S. mutans was the higher counts that diagnosed [(4-10 )] .

## Materials and Method

The present study was performed during the period of July 2018 to September 2019, collection of specimens was in Cardiology Unit of AL-Hussein Educational Hospital in Kerbala City for (86) cardiovascular disease patents distributed into ( 42 males and 18 females), aged between (24 to 70) years old who received endarterectomies, catheter-based atherectomy, or similar procedures because of various manifestations of ischemia for heart valve and blood vessels and atherosclerotic patients. Also a pool of (23) diagnostic catheterization tissue specimens were from 15 males and 8 females that obtained as a control group.

Subjects and Collection of Specimens

After clinical diagnosis of CVD patients, the vascular and atheromatous plaque biopsy samples from the tips of the therapeutic and diagnostic catheters of CVD patients and control group were achieved with highly sterile conditions, each endarterectomy specimen was immediately transferred into1.5 ul polypropylene microcentrifuge tube contained 500 ul of 0.9% sterile normal saline solution, and rapidly transferred and subjected to the laboratory for molecular investigation.

**Isolation of DNA**

DNA Extraction from all of the vascular and atheromatous plaque biopsies was carried out by using Genomic DNA Mini Kit (Geneaid, Korea)/ Tissue protocol according to the manufacturer's instructions. The concentration of chromosomal DNA was measured with Q5000 UV-Vis Spectrophotometer at (260nm) and DNA quality was assessed by the 260:280 nm absorbance ratio, and about 20-25 nanogram /microliter of isolated DNA aliquots were used for molecular detection of Streptococcus mutans by Nested Polymerase Chain Reaction (Nested PCR) technique according to [20- 21- 22] .

**Detection of Streptococcus mutans By Nested PCR**

Isolated DNA was used for detection the genus specific of Streptococci was performed by PCR depending upon pair of primers specific to 16s rDNA of the genus Streptococci in Table no.1, according to the amplification reaction program in Table no.2. And the DNA product samples of 1st amplification reaction were used as a template for the detection of Species specific S. mutans by means of 16s rDNA primer pair of Specific species S. mutans in (table no.1) according to the 2nd amplification reaction program in (table no.3) [23- 24] .

**Table 1: Primer sets that used for detection of Streptococcus mutans by N PCR.**

| Bacterium | Sequence of Primers (5 – 3) | | Length | References |
|---|---|---|---|---|
| Streptococci species 8UA | F | 5"- AGAGTTTGATCCTGGCTCAG -3 " | 1505 | (23, 25) |
| | R | 5"-TACGGGTACCTTGTTACGACTT-3 " | 1492 | |
| Streptococcus mutans | Sm1 F | 5"- GGTCAGGAAAGTCTGGAGTAAAAGGCTA-3" | 282 | (26, 27) |
| | Sm2 R | 5" -GCGTTAGCTCCGGCACTAAGCC-3" | 282 | |

F= forward primer, R= reverse primer. Sm= Streptococcus mutans

**Table 2: (1st Amplification reaction program) for amplifying 16S rRNA gene of the Genus Streptococcus by PCR technique according to (23,25).**

| No. of cycles | Stage | Temperature °C | Time |
|---|---|---|---|
| 1 | Initial denaturation | 95 | 5 min. |
| 30 | Denaturation | 95 | 30 Sec. |
| | Annealing | 58 | 30 Sec. |
| | Elongation | 72 | 1 min. |
| 1 | Final extension | 72 | 5 min. |

**Table 3: ( 2nd Amplification reaction program) for amplifying 16S rRNA gene of Streptococcus mutans by Nested PCR technique according to [26-27 -38-39- 40-41] .**

| No. of cycles | Stage | Temperature °C | Time |
|---|---|---|---|
| 1 | Initial denaturation | 95 | 5 min. |
| 30 | Denaturation | 95 | 1 min |
| | Annealing | 56 | 1 min |
| | Elongation | 72 | 1.5 min. |
| 1 | Final extension | 72 | 10 min. |

### DNA Analysis and Electrophoresis

The amplified DNA products of the 1st and 2nd PCR (Nested PCR) reactions were analysed by electrophoresis in a concentration of (1.5) % Agarose gel (which prepared from 1.5 gm. of very pure agarose powder melted in 100 ml. of 1X TBE buffer ( 0.89 M Tris Base, 0.89 M Boric acid, 20 mM EDTA) (PH 8.3), separation of amplified DNA products was done by mixing 5 µl of PCR product with 2 µl of 6x loading dye, then, the mixture was loaded into the well of the gel with the using of DNA ladder with molecular weight 1K bp. Ladder and 100 bp. (Accu Bioneer/Korea) as a molecular size marker via the agarose gel at an electric current of 90 Volts for one hour through horizontal gel electrophoresis system (Sigma Chemicals Co. USA).

## Statistical Analysis

The collected data were analyzed using the statistical system and Chi-Square ($\chi 2$) test, with P-value of $\leq 0.05$.

## Results and Discussion

Nested Polymerase chain reaction (N-PCR) technique was subjected in the current study for detecting Streptococcus mutans in CVD samples, whole genomic DNA, which was yielded directly from CVD specimens was applied to 1st reaction of N-PCR using universal primers pair specific to 16s rDNA of the genus Streptococci., then, the positive amplified DNA products (1505 bp. size) by PCR which represent Streptococcus genus, were detected in all the 1-5 CVD samples (Fig. 1). The 2nd reaction was performed by using (DNA products of the 1st N-PCR reaction as a template) with 16s rDNA primer pair specific to the species of Streptococci mutans.

Moreover, Streptococcus mutans was specified in all positive 1-5 CVD samples. (Fig. 2) that revealed the existence of the amplified PCR products (282 bp.) as applied by [23- 31] , this procedure was identical to the

investigations of a similar related studies for identifying S. mutans targeting 16S rRNA gene which was a proper manner for determining the microbial population of the biofilms in pathological specimens of CVD [18-21-22-30] , as well as divers variety of PCR and sequencing techniques, in which amplification and nucleotide characterization of 16S rRNA gene remains using primer sets targeting the sequence common in eubacterial species, were broadly performed for identifying bacterial species [32] . Moreover, universal primers for 16S rRNA gene of species specific S. mutans was depended in a broad range of similar studies including [7-20 -21] .

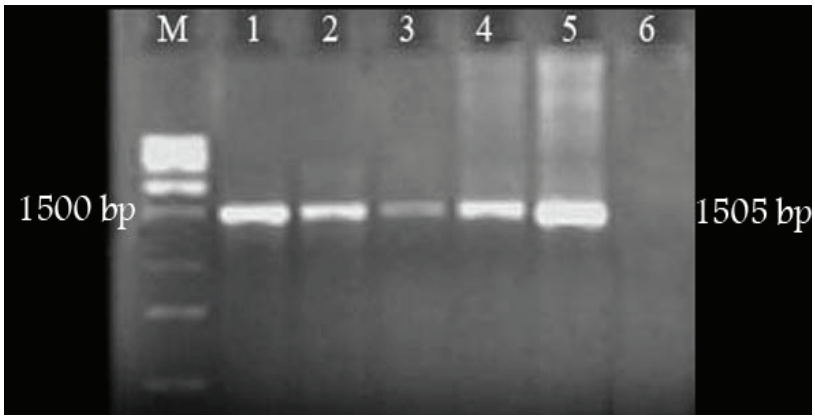


**Figure 1: Agarose gel electrophoresis of DNA products of PCR amplification for 16s rDNA specific for Streptococcus genus for the biopsy samples of CVD plaques. Lane M; DNA ladder marker with molecular weight (1000 bp.), (Lanes 1, 2, 3, 4 and 5: represents positive biopsy samples of CVD patients, and Lane 6: negative sample.**

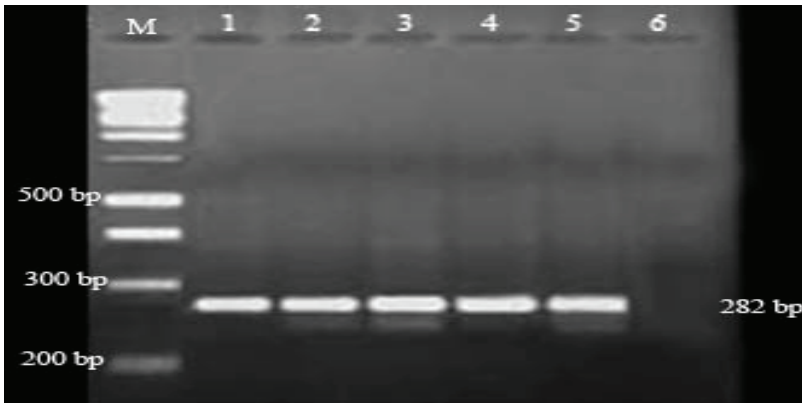


**Figure 2: Agarose gel electrophoresis of DNA products of N-PCR amplification for the species specific Streptococcus mutans for the biopsy samples of CVD plaques. Lane M; DNA ladder marker with molecular weight (100 bp.), Lanes 1, 2, 3, 4, 5: positive biopsy samples of CVD patients and Lane 6: negative sample.**

In the present study, specification of DNA samples of S. mutans within the biopsies of heart valve, blood vessels and atheromatic plaques of Iraqi CVD patients is the propel evidence for contributing the fundamental cariogenic pathogen in the target biofilms, DNA aliquots of S. mutans was found in 60/86(69.7%) of the enrolled CVD patients with significant importance X2= 5.882 (P-value of ≤ 0.05) in male patients were 42/60 (70 %) more than in females 18/60 (30%) table 4., this result was consistent with numerous previous related studies revealed the most frequently microorganism found in the heart valves samples was the S. mutans (89.3%), of 42 CVD patients with a mean age of 55.6-13.8 years regarding the medical conditions that led to valve replacement surgery and was agreed with Japanese patients revealed S. mutans was higher percentage (77.8)% than the other oral and periodontal bacteria, using simple PCR method and Streptococcus mutans was commonly diagnosed (69%) in the heart valve and (74%) in atheromatous plaque of the vascular wall specimens.

**Table 4. Distribution of Cariogenic Streptococcus mutans in cardiovascular disease Patients and control groups.**

| **Streptococcus mutans in Subjects** | | | | | | **Statistical analysis** |
|---|---|---|---|---|---|---|
| **Variable** | | **Cardiovascular disease group 86** | | **Control group 23** | | |
| | | **(+)No, Percentage** | **(-) No, Percentage** | **(+) No, Percentage** | **(-) No, Percentage** | |
| Gender | Male | 42/60 (70 %) | 11/26 (42.3 %) | 3/23 (13%) | 12/23(52 %) | X2= 5.882 DF= 1 P ≤ 0.05 |
| | Female | 18/60 (30 %) | 15/26 (57.7 %) | 3/23(13%) | 5/23(22 %) | |
| Age | 24-60 years | 33/60 (55 %) | 20/26 (77 %) | 2/23(8.7%) | 12/23(52 %) | X2= 3.687 DF= 1 P ≤ 0.05 |
| | > 60 years | 27/60 (45 %) | 6/26 (23 %) | 3/23(13%) | 6/23(26 %) | |

Daboor, et al., (2015) revealed S. mutans is actively trained in its automatic modes of biofilm formation., the cariogenic Streptococcus mutans successfully employs dietary sucrose for the production of exopolysaccharide, which proceed as a scaffold for its biofilm, thus participating to its pathogenic activity, situational stress tolerance, and resistance of many antimicrobial agents [(5)] .

On the other hand, in the current research, specification of DNA of S. mutans in CVD patients 42/60 (70%) in males more than 18/60 (30%) in females with significant importance X2= 3.687 (P-value of ≤ 0.05), this result may be elevated in the collectively number (53) of CVD males patients more than total (33) CVD females that enrolled in this study in comparison to the control group that reflects no significant difference as demonstrated in Table 4.

As well as, CVDs are commonly occurs in human due to a diverse array of intrinsic and extrinsic factors and mechanisms particularly biofilms forming bacteria like S. mutans and related members and their products, this result concur to previous finding by [(30 )] concluded that increasingly evident of a broad range of mechanisms are utilized by different members of the viridans group Streptococcai to promote thrombosis in cardiac and vascular atherosclerosis plaques and the progression of CVDs such as Infective Endocardits.

## Conclusions

The present study adds considerable evidence for the involvement of oral commensal bacteria S. mutans strain in human CVDs via its ability to colonize and populate in oral environment and spread throughout blood stream to cardiovascular system forming biofilms and atherosclerotic plaques in male CVD patients more than in females and in younger ages more than old peoples, S. mutans, which shows serious impacts on the human's health. So that, more work has to be done for the sake of preventing this terrible and transferrable bacterium from invading the bloodstream and eventually the endothelial tissues of the heart and preventive techniques such as brushing twice a day, reduction in sucrose rich foods, regular mouth washing, proper flossing and brushing, essentially keeping the mouth free from existence of bacteria which causes dreadful diseases.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols

were approved under the Department of Microbiology and all experiments were carried out in accordance with approved guidelines.

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# Effect of Omega-3 on Induced Cutaneous Wounds Healing in Rabbits

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## Abstract

The present study was designed to evaluate the effects of omega3 on full-thickness cutaneous wounds healing in rabbits. All animals were created wound (1.5 cm2) full-thickness in dorsal back region in (16) male adult rabbits, clinically healthy weighing from (1.3- 1.8 kg). Under the effect of intramuscular administration of a mixture of xylazine hydrochloride 5mg/kg with ketamine hydrochloride 35mg/kg of and 1 mg/kg of Diazepam. The treatment group was given 300 mg of omega3 orally daily with single dose (group A), while in group (B), the rabbits were left without treatment, as a control group. For clinical and histopathological evaluation, each group was divided into four subgroups (two wounds/subgroup) on 3, 7, 14 and 21th days post-wound creation and treatment. The result revealed, Clinically, the rate of wound healing was same in all groups, no differences when section taken from the edge of the wounds. The results histopathologically, shown the treated groups have greater cellularity with improved vasculature with the superiority of omega 3 -treated groups than those in untreated groups. Conclusion; the histopathologically and clinically results confirmed that given effects of omega3 to the treated groups leads to enhance and develop of cutaneous wound healing.

***Keywords:*** *omega3, wounds healing, rabbits,*

## Introduction

A wound is a disruption of the normal continuity or contiguity of body structures caused by physical injury [(1)]. Wound healing is a biological process that happens after a physical, chemical, or biological causes led to breaken of epithelial barrier [(2-3)]. The wound care is older skill such as old human civilization, in the recent decades, available the advanced medical science, improve healing suffer from lack when get oral medication. Therefore, an active drugs as oral formulation to be immensely beneficial to the heal wound due to simple of use and enhance of healing time, Omega-3 is one of them [(4)]. Though, recently that adequate levels of essential nutrients is being recognized to prevent and treat some disturbances [(5)]. Omega-3 fatty acid is one of the essential fatty acids in human body that can be found in the sea products, especially fish and fish oil and in some of the seeds oils. omega-3 have many important benefits like they entered in a good feeding and treated for many diseases as they decrease rheumatoid arthritis [(6)]. Current modern studies demonstration that omega-3 can control the activity of the nuclear factor (NF-kß) [(7)], that acting a main role in the gene expression regulation in inflammatory reactions and associated in the pathogenesis of cardiovascular disease [(8)]. Therefore, The purpose of this study was to evaluate and compare the effects of omega3, on full-thickness cutaneous wounds healing.

## Materials and Method

### Experimental Animals

Sixteen adult male rabbits were used in the study that divided into two groups (eight rabbits for each group) weighing from (1.3- 1.7 kg). The animals were housed in the animal house of the Veterinary Medicine College, Karbala University, maintained in individual cages along the period of the experiment under controlled conditions including, management, environment and feeding.

### Surgical operation

Food was hold for 6-12 hours and water 5 hours

before surgical operation. The area of dorsal back region should be shaved and cleaned, after that general anesthesia was induce with diazepam as a preanesthetic in dose 1mg/kg b.w. after 10 min. injected with xylazine in dose 10 mg/kg b.w. and ketamine in dose 50 mg/kg b.w. all this drugs injected intramuscularly [9]. The rabbits were hold in ventral recumbency and the dorsal aspect (back) of the animal was prepared for aseptic surgery. On each animal, one square (1.5×1.5) cm full-thickness skin wounds were created in dorsal back region. The rabbits was divided to two groups, group (A) as the treatment group was treated with single dose daily of 300 mg omega3 orally for 3 weeks, while, in group (B), the rabbits were left without treatment, as a control group.

**Clinical Evaluations:** In this study, all rabbits were exposed to complete clinical examination every three days during the experimental period. All wounds were taken by digital photographs after the area prepare with carefully shaved to see margin of the wound. The scab was removed carefully for each wound for well visualize of the granulation tissue and epithelization area.

**Histopathological evaluation** :The histopathological evaluation was performed on day (3, 7, 14 and 21) post-treatment with omega3 and the same period was depended for the control group (four rabbits / period). For histological analysis, a biopsy specimens were obtained (5-6) µm in thickness and they included about (3-4) µm of skin intact on both sides of the wound they were fixed in (10%) neutral formalin solution, and prepared routinely and staining by hematoxylin-eosin (H&E) [10].

## Results

### Clinical Evaluation

The clinical statement of wounds seemed actually that the treatment and control wounds were showed quickly decreased in size through the current study. The change was started at 3rd days in both control and treated wounds, which became clear at day 14th, especially in treated wounds. These differences continued to be present until day 21th post-treatment. In addition, the size of the treated wounds observed lesser than those in control wounds. The clear differences appeared in the in total wound healing between treatment & control wounds, mainly at the end of the study **(Fig.3.1**).

### Histopathological Evaluation

The histopathological experimentally produced for tissue biopsies of the wound margins and beds shown the chief differences between control and treatment wounds were began after three days post-treatment. The histopathological sections, of treated group on day 3 post-wounding, shows aggregation of intensive of inflammatory cells. At the same period, the histopathological sections of control group were shown a little infiltration of inflammatory cells.

On 7 day post-treatment, the histopathological observation in control group was showed the new blood vessels and inflammatory cells. The histopathological sections of treatment group, 7 days post-treated, were showed presence of proliferation of more small blood vessels with proliferation of fibroblasts cells. On 14 day post-wounding, the histopathological section of control group, was showed the new blood vessels, inflammatory cells. the histopathological section of treated group on day 14 post-treated, was showed more vascularity with formation of keratin and thicken of epidermis. The histopathological section of control group, 21st days post-wounding, showed the presence of epidermis and presence of sebaceous glands. The histopathological section of treated group, 21st day post-treatment, was appeared thick epidermis layer with well development of hair follicles and presence of sebaceous gland.

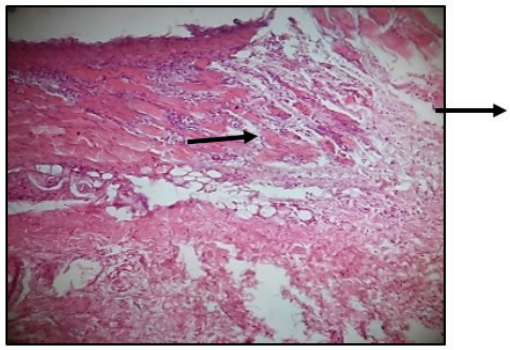

**Fig.1**: Histopathological section of treated group on day 3 post-wounding, shows aggregation of intensive of inflammatory cells (black arrow) (H&E X100).

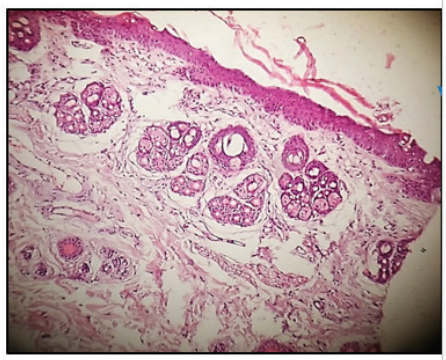

**Fig 2**: Histopathological section of control group on day 3 post-wounding, shows little infiltration of inflammatory cells (blue arrow) (H&E X100).

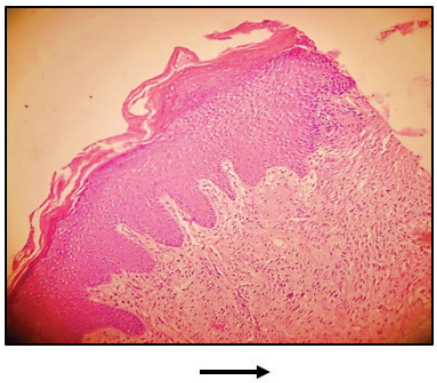

**Fig 3**: Histopathological section of control group on Day 7 post-wounding, shows the new blood vessels (black arrow), inflammatory cells (blue arrow) (H&E X100).

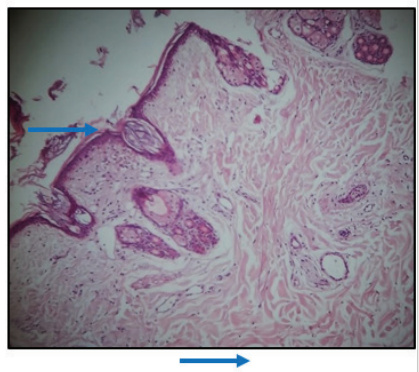

**Fig. 4**: Histopathological section of treated group on day 7 post-wounding, shows more small blood vessels (angiogenesis) (yellow arrow) with proliferation of fibroblasts cells (black arrow)) (H&E X100).

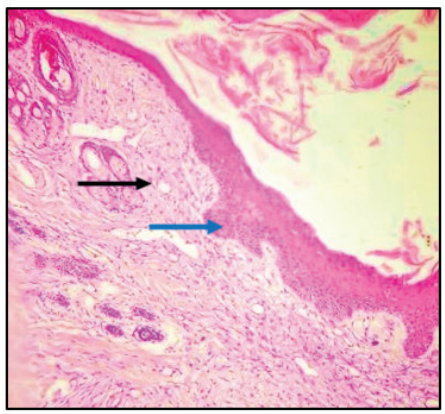

**Fig 5**: Histopathological section of control group on 14 day post-wounding, shows the new blood vessels (black arrow), inflammatory cells (blue arrow) (H&E X100)

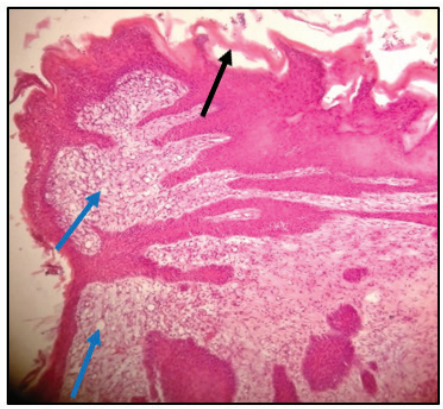

**Fig 6**: Histopathological section of treated group on14 day post-wounding, shows more vascularity (blue arrow) with formation of keratin (black arrow) and thicken of epidermis (H&E X100).

## Discussion

### Clinical Evaluation

Wound healing process is a biological, complex, progressive that occurs directly because of disruption in epithelial barrier consequently after chemical, physical, or biological causes. In this process activation occurs for inflammatory cells such as platelets, neutrophils, macrophages and fibroblasts [2-3]. In the current study, the assess and compare the effects of omega3 on the healing of full-thickness cutaneous wounds in the rabbits supply improved blood vessels and better epithelization, to all post-treated groups compared with the control groups. The clinical observations of wounds in the present study appeared that the level of development of healing process was started rapidly in both control and treatment wounds, but the progression was high in the treated groups & than those in control wounds. The clinical following-up appeared that all wounds of treatment and control groups were decreased rapidly in size along the study, but the clinical inspection revealed that the rate of wound closure (contraction) in treated groups were significantly more along the period of the study as compared to control groups. These differences were continued to be present until day 21 post-treatment. These results are close to the results obtained by [11] who used topical and systemic effects of omega-3 on oral mucosal wound healing in albino rats. They investigated the omega3 have greatly enhanced ulcer healing with superior effects when using topical application. In the other research that shown increase cell membranes fluidity when used omega-3 [12]. Cell membranes provide a significant function into and out of cells by regulating crossing of chemical signals, hormones, and nutrients; this led to different effects, from increasing glycogen storage to enhancing muscle protein synthesis [13]. On the other hand, [14] Animals before surgical incision for 21 days get a food containing fish oil was made and for 10 or 30 days after wounding, showed that content of collagen was similar at the same period.

In the study of [15] revealed that omega-3 enhanced closing of open wounds at first (5 days), not as other fatty acids moreover may have significant effects on healing of the wound. Treated the wounds with oleic acid healing faster than the wounds that treated with linoleic acid.

### Histopathological Evaluation

The valuation histopathologically of tissue biopsies from the wound peripheries and beds in the current study discovered that the chief differences between control and treatment wounds were happening at day 3 post-treatment and continuous until the end of the study. The histopathological sections showed that the proliferation of blood capillaries and intensive of inflammatory cells infiltration in treated group were more developed than that in control wounds through 3 and 7 day of the study. Also in the histopathological section of treated group on day 14 and 21st days post-treated, was showed more vascularity with formation of keratin and thicken of epidermis with well development of hair follicles and presence of sebaceous gland than control group.

These results are in agreement with the results obtained by [11] when use local and systemic omega 3 application, there was a gradual reduction in inflammation, increase in epithelial and connective tissue regeneration, appearance of keratin layer, and finally high vasculature, all occurring gradually throughout the period of 2, 4, and 8 days, giving the best repair effect at the end of the treatment period. In the study of [16] showed that omega-3 fatty acids augmented closure of open wounds first 5 days, Also mention that omega-3 in fish oil may have a support effect on primary wound epithelialization, then reducing scar formation through inhibit later collagen deposition.

## Conclusions

Omega3 can be used for acceleration and enhancement of cutaneous wounds healing. The healing in the treated group appear an effective when compared with control group.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Surgery and Obstetrics, College of Veterinary Medicine and all experiments were carried out in accordance with approved guidelines.

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# Use of Iraqi Castor (*Ricinus Communis*) Leaf Extract as Anti-Inflammatory in Treatment of Skin Wounds in Rabbits

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## Abstract

The present study was investigate to study the effects of castor leaf extract on histological healing rates of skin wounds in rabbits. sixteen adult clinically healthy rabbits from both sexes weighing from (1.25- 2 kg) were used. All animals were created wound ($4cm^2$) full-thickness in abdominal region .The treated group (B) application of the extract on the wound to all animals while group A (control group) leave without treatment. On day 3, 7, 14 and 21 post operations collect skin tissue biopsy samples for histopathological examination each time two rabbits. The result revealed, Clinically, the rate of wound healing was same in two groups, no differences when section taken from the edge of the wounds, histopathological result was show: In 3rd day of skin wound healing group (A) (control group) show demarcation line consisted of polymorphonuclear (PMN), there was thickened at cut edges of epidermis with inflammatory cells, the inflammatory responses of group (B) (treated group) were observed in low range than the control groups. In 7th day of skin wound healing group

(A) show few small vessels were present and tensile strength of the tissue by organized collagen fibers, group (B) show good tensile strength, increased in small vessels and better wound healing. In 14th day of skin wound healing group (A) show vascular density was noticeable, group (B) show increased vascular density than in group (A).

***Keywords:*** *Castor, Skin, Rabbits, wound healing. Anti-inflammatory*

## Introduction

Ricinus communis, also called castor oil, is one of the most important shrub belonging to the family (Euphorbiaceae) and spread in tropical and subtropical regions[(1)].The castor are almost small tree 6 meters in length and they are spread globally in South Africa, India, Brazil and Russia[(2)]. In Iraq, it spreads in central and northern Iraq, as well as in the western regions[(3)]. All parts of the plant are used medically, the stem of the castor plant use as anticancer and antidiabetic[(4)], in Indian medicine, the roots of the castor plant and its five-lobed leaves were used in the treatment of various diseases such as skin ulcers, liver disorder, hypoglycemic and laxative [(5)]. The wound healing is a complex, interactive integrative process that commences right after injury invading cellular and chemotaxis activity[(6)].The wound is a physical injury of body that described by distraction normal continuity structures of body. Wound may cause damage in superficial structures skin and reach to structures underlying the skin[(7)]. The tolerance of injury was a varies with tissue type. Therapeutic considerations are based on the type of skin wound and often determine the amount of tissue damage[(8)]. The anti-inflammatory pharmacological activity of castor (Ricinus communis) observed due to the presence of phytochemicals like flavonoids, alkaloids and tannins that present in the plant extract and various biological activates[(9)]. The plant extract has antibacterial activity against Escherichia coli, Salmonella newport, Serratia marcescens, Streptococcus progens and Shigella flexneri[(10)],Bacillus subtilis and Staphylococcus aureus[(11)], Klebsiella pneumoniae, Escherichia coli, Proteus vulgaris, and Pseudomonas aeruginosa[(12)].

The aim of this study was to estimate the benefits of using Iraqi castor (Ricinus Communis) leaf extract in

skin healing in rabbits.

## Materials and Method

This study was carried out on sixteen adult clinically healthy rabbits from both sexes weighing from (1.25-2 kg) were divided equally into two group A (control group) and group B (treatment group) .The animals were housed in the animal farm of the College of Veterinary Medicine, University of Karbala, maintained in individual cages under normal environment including climate, management and feeding all animals were subjected to the creation of a full wound (4 $cm^2$) in the abdomen after preparation for sterile surgery [13].

In this study used fresh leaves of Ricinus communis Linn. (Fam. Euphorbiaceae) with entire petiole. The leaves were collected from soada region in Karbala province, and washed after collection to remove the debris then dried this leaves and the dried leaves were powdered to get a coarse powder then moistened the dried powder material of Ricinus communis (200 gm) with adequate amount of methanol and subjected to soxhlet extraction 3 cycles of solvent and concentrated to get about 16 gm [14].

General anesthesia was induced by diazepam (diazepam 10). The ampoule contains 2 ml (10 mg/ml), Aleppo, pharmaceutical industries, Aleppo - Syria) as surgery at 1 mg/kg body weight. After 10 min syringe with zylazine (2% zylazine® contains 50 ml (20 mg/1 ml), Ceva Saute animal, Spain) at a dose rate of 10 mg/kg body weight. Ketamine® (10%) contains 10 ml Vet. Injection, Kepro Pharmaceuticals, Netherlands) at a dose rate of 50 mg/kg body weight. All these drugs are injectable [15].

On each animal, one full thickness (4 $cm^2$) was created in the abdominal area using a mold made from X-ray film for all animals and the wound tailor was sewn by 3-0 silk by intermittent horizontal stitching. after that application of the extract on the wound to all animals in group B (treatment group) while group A (control group) leave without treatment.

On day 3, 7, 14, and 21 collect skin tissue biopsy samples for histological examination of groups A and B group for each time two rabbits. The samples were fixed in 10% neutral formalin then cut into 5 μm thick sections and stained with hematoxylin and eosin (H & E), and investigated for microscopy [16].

## Results and Discussion

All animals were noted to eat and behave normally in the first three days after surgery. Clinically, the rate of wound healing was same in all groups, no differences when section taken from the edge of the wounds.

The animals remained healthy, without clinical of infection after the surgery period. The macroscopic observation of all groups during the wounding confirmed the aseptic conditions. Wound healing is a complex biological method that takes place in all tissues and all organs of the body. Various cell types, including keratinocytes, neutrophils, macrophages, lymphocytes, fibroblasts and endothelial cells, are involved in this process [17].

In 3rd day of skin wound healing group (A) (control group) the inflammatory reaction was dominant. On the skin surface, necrosis of skin tissue was saturated as a consequence of mechanical damage . This stage was observed also under the tissue necrosis. The demarcation line consisted of polymorphonuclear (PMN), the epidermis was thickened at its cut edges with inflammatory cells, while in treated group show inflammatory responses at lower range than control groups (Figure. 1).

The inflammatory response is started very soon after the trauma on wound event, its the wound healing first phase. Wound and surrounding tissues become inflamed during the first phase and cells mostly neutrophils and monocytes are mobilized to infiltrate the clot and start the complex procedures of synthesis granulation tissue [18].

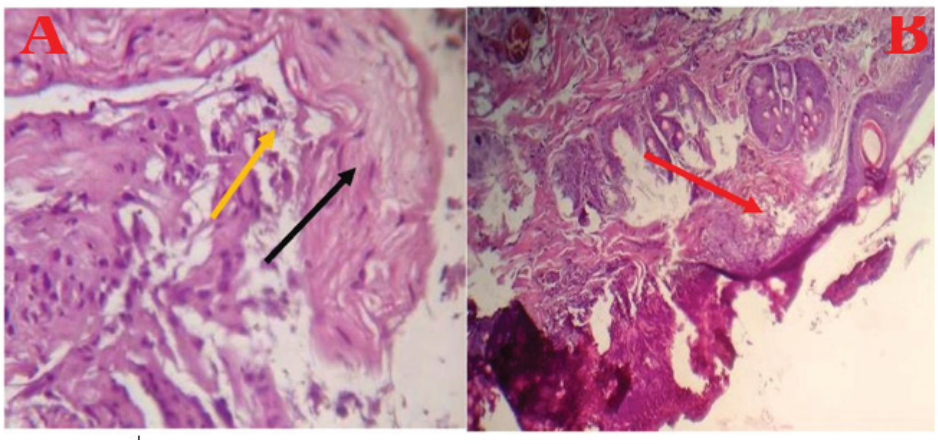
In 7th day of skin wound healing were increased new organized collagen bundles and relatively advanced epitheliumat the wound because treated with castor leaf extract (group B) when compared with non-treated wounds (group A). In treated tissues with castor leaf extract appear several small vessels (angiogenesis), whereas in control tissues was present only a few vessels. The tensile strength of the tissue originate from organized collagen fibers, the collagen was observed consistent arrangement with tissues in the treated group

that give good tensile strength and improved wound healing (Figure 2).

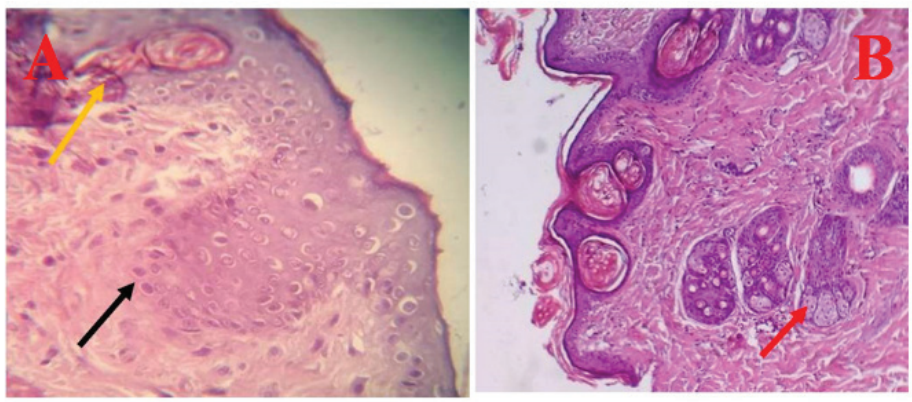
The cell surface binding edges of wound have to myofibril contraction, also present of fibroblasts other cells. A fibrin or fibrinogen was showed to interact specifically with platelets [19]. In 14th day of skin wound healing increased in the mean vascular density of the castor leaf extract treated groups(B) when compared with control groups(A). Consequently, it can be established that treated group by castor leaf extract improved angiogenesis at the wound beds when compared with non-treated groups (Figure. 3).

Small amount of voltage produced as long as the collagen bundle was subjected to stress was arrangement and absorption of collagen [20] .In 21th day of skin wound healing through rich neovascularization all wounds contained abundant fibroblasts and collagen bundles, that noticed only in the wounds treated with castor leaf extract (Figure 4).

Moreover, platelet concentrates comprise many chemotactic growth factors and powerful mitogenic, which regulate tissue repair key processes complex, including cell proliferation, chemotaxis, migration, cellular differentiation, and extracellular matrix synthesis [21] . According to the result of this study the effect of castor leaf extract in wound healing shown positive result in acceleration of epithelial migration, the angiogenic response and fill of tissue. Castor leaf extract accelerate healing both normal tissue and impaired wounds when locally applied.

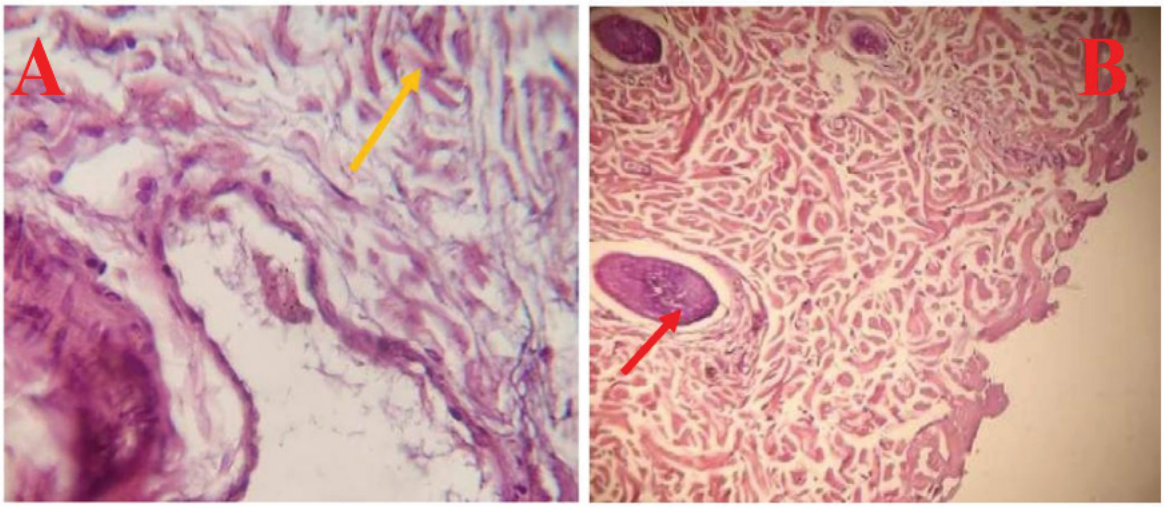



**Fig(1) histological cross section of skin show: (A) 3rd day wound healing demarcation line consisted of polymorphonuclear (PMN) ( ), the epidermis was thickened at its cut edges with inflammatory cells ( ) , (B) 3rd day wound healing inflammatory responseswere observed in low range than the control groups ( ) (H &E stain) 40X.**



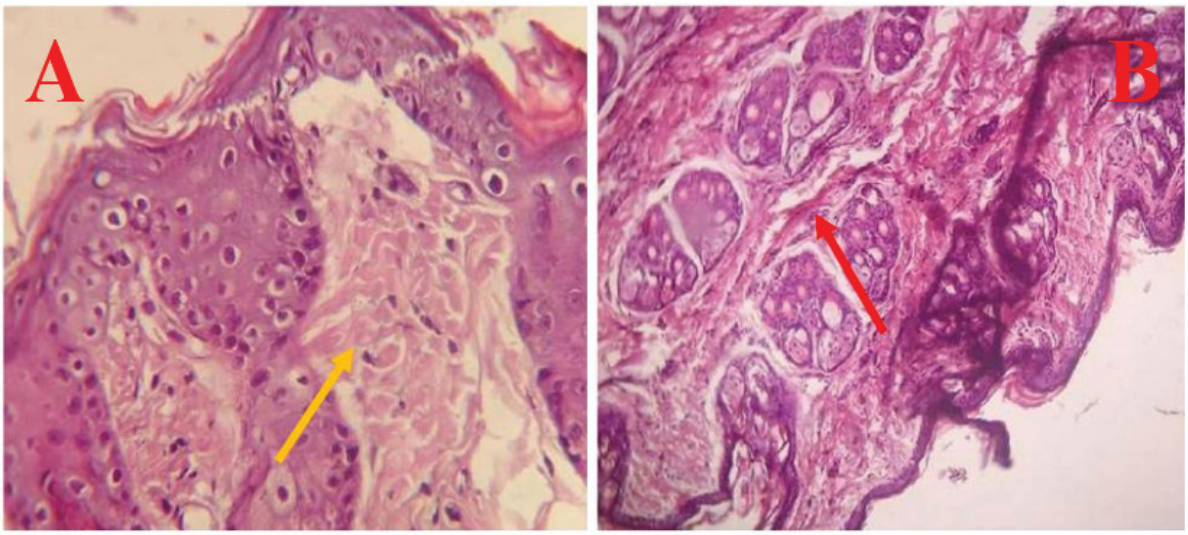

**Fig(2) histological cross section of skin show: (A) 7th day wound healing which few small**

vessels were present ( ), organized collagen fibers give tensile strength to the tissue( ) (B) 7th day wound healing increased in small vessels, good tensile strength hand improved wound healing ( ) . ((H &E stain) 40X.




**Fig(3) histological cross section of skin show: (A) 14th day wound healing which vascular density was noticeable( ) (B) 14th day wound healing increased vascular density than in**

(A) ( ). ((H &E stain) 40X.




**Fig(4) histological cross section 21th day wound healing show:(A) increase of vascular density and collagen bundle ( ) . (B) through rich neovascularization wounds contained abundant fibroblasts and collagen bundles, ( ) (H &E stain) 40X.**

## Conclusion

The results of systematic review and hisological analysis shown that the time of wound healing in group was treated with castor leaf extract shorter than non-treated group.

**Financial disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Veterinary Medicine and all experiments were carried out in accordance with approved guidelines.

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# Assessment of Child Complications Related to Fluids and Electrolyte Disorders in Babel Hospital for Mothers and Children in AL-Hilla City

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**Abstract**

This is a descriptive study aimed at assessing children's complications related to fluid and electrolyte disorders. Data were collected in Babel Hospital for Maternal Children through a questionnaire model and data analysis by frequency and percentage, the results showed that (86%) of children lose their appetite, while (14%) They do not lose their appetite, results also show (72%) suffer from diarrhea, while (28%) do not suffer from diarrhea, as results show (20%) suffer from dry mouth, while (80%) do not suffer from dry mouth, The results also show (10%) suffer from syncope, (90%) do not suffer from syncope.

**Objectives:** Evaluation of complications related to fluid disturbances with electricity in the child.

Knowing the demographic characteristics of young children who suffer from fluids in disorders such as age, number of children in the family, and number of children in the family.

**Methodology**: A descriptive study used to assess complications related to a fluid electrolyte disorder for a young child. This study was conducted at Baby and Mother Hospital of Babel during the period (5/2 / 2019_3 / 6/2019).

A purposeful sample of (50) children, and the study was proven by a committee in the College of Nursing. Statistical SPSS was used to analyze the results of this study

**Results**: According to the interpretation and discussion of the study results, (72%) of the children had diarrhea (48%) of the children had vomiting. (62%) are dependent on artificial feeding, (34%) of children have experienced accidents or fall from a height.

***Key words:*** *small child, liquids, electrolyte disturbance*

## Introduction

Total body water (TBW) consistently represents 70% of lightweight body weight across age and sex, but differs as a percentage of actual body weight between groups and individuals due to the variance of fatty tissue deposition, which contains less water than the muscles. TBW is -75% of total body weight in newborns, 70% in infants and 45% in the elderly. The average age of an adult male (70 kg) is 60% of the total body weight (42 l) as water and an adult female (50 kg) has 55% (27 l). This water is distributed between extracellular compartments (ECF) and intracellular (ICF). [1]

Electrolytes are chemicals in the body that regulate important physiological functions. Examples of electrolytes are sodium, chloride, magnesium, potassium, and calcium. [2]

The concentration of electrolytes in the body is controlled by a variety of hormones, most of which are made in the kidneys and adrenal glands. Sensors in specialized kidney cells monitor the amount of sodium, potassium and water in the bloodstream. [3] Electrolyte disturbance is a defect in some ionized salts (such as bicarbonate, calcium, chloride, magnesium, phosphate, potassium and sodium) in the blood. [4]

Electrolyte imbalance can also be caused by a lack or excess of minerals in the body, there are medical reasons such as: Addison's disease (deceased production of hormones by the adrenal glands), alcoholism, diabetes, diarrhea, heat exhaustion, kidney disease and vomiting.

May be caused by an electrolyte imbalance with medications including:

ACE inhibitors, calcium supplements

Some of the hormones that protect potassium (which cause the kidneys to retain potassium), diuretics, which promote fluid secretion through the kidneys and potassium supplements. (5)

## Methodology

1- Study design: A descriptive design used to evaluate complications related to a child's liquid electrolyte disturbances.

2- Preparing the study: This descriptive study was conducted in Baby and Mother Hospital in Babylon during the period (5/2/2019-3 / 6/2019)

3- Selecting the sample: A purposeful sample of (50) sick children.

4- Administrative permission: The study was proven by a committee in the College of Nursing.

Statistical analysis: Use descriptive statistics to analyze the results of this study.

## Results

**Table (1): Complication of fluid & electrolytes disturbance**

| No | Variables | Frequency | | Percentage | |
|---|---|---|---|---|---|
| | | Yes | No | Yes | No |
| 1 | Is the child suffering from diarrhea? | 36 | 14 | 72% | 28% |
| 2 | Is the child suffering from vomiting? | 24 | 26 | 48% | 52% |
| 3 | Is the child suffering from a fever? | 13 | 37 | 26% | 74% |
| 4 | Is the child drinking adequate amounts of water? | 27 | 23 | 54% | 46% |
| 5 | Is the child lost his appetite? | 43 | 7 | 86% | 14% |
| 6 | Is breastfeeding a child? | 19 | 31 | 38% | 62% |
| 7 | Is the sunken eyes of a child? | 32 | 18 | 64% | 36% |
| 8 | Is the child suffering from lack of elasticity of the skin? | 15 | 35 | 30% | 70% |
| 9 | Is the child suffering from dry mouth? | 10 | 40 | 20% | 80% |
| 10 | Is the child suffering from lack of urine output? | 26 | 24 | 52% | 48% |
| 11 | Is your child suffering from a lack of sweating? | 20 | 30 | 40% | 60% |
| 12 | Is the child suffering from fainting ? | 5 | 45 | 10% | 90% |
| 13 | Is the activity of the child changing , become idle? | 40 | 10 | 80% | 20% |
| 14 | Is the color of the skin change , becoming pale? | 35 | 15 | 70% | 30% |
| 15 | Is the color of urine changing ? | 30 | 20 | 60% | 40% |

## Discussion

Also (48%) of the children suffer from vomiting, while (52%) do not suffer from this point, and excessive vomiting, especially over a long period of time, leads to the loss of excess water and electrolytes from the body, and the result agrees as my opinion.

(26%) of children suffer from fever, while (84%) do not suffer from this point, the temperature rises quickly or exceeds 39.5 degrees Celsius, and breathing increases, and the heart rate usually rises. Dehydration is caused by excessive sweating and increased vapor loss due to the rapid respiratory rate.

Also (38%) of infants are breastfed, while (62%) depend on breastfeeding, which may cause diarrhea at some time or vomiting.

(30%) of children suffer from decreased elasticity of the skin due to fluid and electrolyte loss, while (70%) do not suffer from this point.

Also (10%) of children suffer from syncope there may be too much or too little sodium that can cause cell dysfunction and coma, while (90%) do not suffer from this point.

(14%) of children suffer from physical disabilities and diseases, while (86%) do not suffer from them. There are diseases that cause fluid and electrolyte loss such as kidney or digestive disorders.

Also (34%) of children experienced accidents or falls from high places. In these cases, the child experienced severe bleeding that leads to fluid and electrolyte disturbances, while (66%) do not suffer from this point.

## Conclusion

According to the interpretation and discussion of the study results, the following conclusion was concluded:

1- (72%) of children suffer from diarrhea.

2- (48%) of the children suffer from vomiting.

3- (62%) depends on industrial nutrition.

4- (34%) of the children were exposed to accidents or fall from a height.

**Recommendations:**

1- Baby food must contain minerals and vitamins.

2 - The child must drink a lot of fluids, and drink a lot of fluids when you have a fever, vomiting or diarrhea.

3- Protecting the child from any accidents.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

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# The Rate of Post-Spinal Puncture Headache in Patients Undergoing Spinal Anesthesia According to the Size of Spinal Needle (G22 versus G24): Case Reference Study

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## Abstract

**Background:** A number of disadvantages have been described in associations with spinal anesthesia such as short duration of pain relief, increased incidence of hypotension and post-spinal puncture headache (PSPH). Post-spinal puncture headache symptom has been explained by intracranial hypotension (low CSF pressure) because of CSF leak at site of puncture, causing traction on pain sensitive structures.

**Aim of the study:** The present study was aiming at comparing the incidence rate of PSPH in relation to the gauge of used spinal needle.

**Patients and Method:** The current observational case reference study was carried out at Al-Diwaniyah Teaching Hospital in Al-Diwaniyah Province, Iraq. The beginning of the study is dated back to the 3rd of April 2018 and the study continued till September the 15th 2019. It included 60 patients undergoing spinal anesthesia for various surgical operations. In 30 patients a spinal needle of 22 gauge was used whereas in the second group (n = 30), a spinal needle of gauge 24 was used. All patients were instructed to be nil by mouth overnight.

**Results:** The Rate of post-spinal puncture headache (PSPH) show significant variation according to needle caliber size. Patients who experienced headache in the first group (gauge 22) were more frequent that those in group 2 (gauge 24), 22 (73.3 %) versus 8 (26.7 %) and the difference was highly significant ($P < 0.001$). In addition, severe headache was only seen in group 1 (gauge 22).

**Conclusion:** The incidence and severity of post-spinal puncture headache (PSPH) is significantly related to spinal needle caliber size so that narrower needles are associated with less frequent and milder form of headache in comparison with wider bore needles.

***Key words:*** *post-spinal puncture headache, spinal anesthesia, size of spinal needle*

## Introduction

Of the well-known types of regional anesthesia, spinal anesthesia involves the introduction of local anesthetic agents, opiods or other agents into the subarachnoid space. Actually it is one common form of neuraxial block [3,13] . Indeed, the inception of spinal anesthesia can be dated back to 1885 when James Leonard Corning (made a description of accidental form of the procedure; however, the first planned procedure was pioneered by August Bier in 1898 [12,16]. August Bier reported the "post spinal puncture headache (PSPH)" in addition to other complications such as vomiting, leg pain and backache and proposed that headache is due to loss of cerebrospinal fluid [13,16]. A number of advantages have been described in association with spinal anesthesia such as negligible failure rate, the onset of anesthesia is very rapid, satisfactory pain relief because of dense neuronal block and avoidance of patient morbidity following major surgical operations [3,4,6] ; however, consensus about these advantages is lacking [13]. Actually, this type of anesthesia is preferred for cesarean section operation

because of rapid onset of action [8]. The conclusions of some meta-analyses and randomized controlled clinical trials provided some controversy about the outcome and advantages of spinal anesthesia [3,18].

A number of disadvantages have been described in associations with spinal anesthesia such as short duration of pain relief, increased incidence of hypotension and post-spinal puncture headache (PSPH) [5,20,22]. Post-spinal puncture headache symptom has been explained by intracranial hypotension (low CSF pressure) because of CSF leak at site of puncture, causing traction on pain sensitive structures [5,22]. Several terms have been used to describe such headache including post lumbar puncture headache, post-spinal headache, lumbar puncture headache post-dural puncture headache (PDPH) and spinal headache [13].

The present study was aiming at comparing the incidence rate of PSPH in relation to the gauge of used spinal needle.

## Patients and Method

The current observational case reference study was carried out at Al-Diwaniyah Teaching Hospital in Al-Diwaniyah Province, Iraq. The beginning of the study is dated back to the 3rd of April 2018 and the study continued till September the 15th 2019. It included 60 patients undergoing spinal anesthesia for various surgical operations. In 30 patients a spinal needle of 22 gauge was used whereas in the second group (n = 30), a spinal needle of gauge 24 was used. All patients were instructed to be nil by mouth overnight.

They were given the following premedications: ranitidine 50 mg and metoclopramide 10 mg. An intravenous line was established using the antecubital vein by an 18 gauge cannula on arrival to operative room. Monitering included: pulse oximeter, blood pressure, pulse rate and ECG. An intravenous fluid in the form of ringer lactate was given in a dose of 10mg/kg for 10 minutes before starting subarachnoid block. A midline approach was used with the patient in sitting position at L3-L4 or L4-L5 level with a Quincke spinal needle (22G or 24G). Keeping the needle bevel parallel to dural fiber was assured. Injection of heavy bupivacaine 9-12.5 mg (1.8-2.5ml) was performed once clear CSF fluid was obtained.

The approval of this study was made by the institutional ethical approval committee and a verbal consent was made by every participant. Variables included in the current study were gender, age, type of operation and the development of post-operative headache. The obtained data were transformed into an SPSS (IBM, Chicago, USA, version 23) spread sheet for purpose of statistical description and analysis. Chi-square test was used to study association between categorical variables whereas, independent samples t-test was used to study mean difference of quantitative variables between the two study groups. The level of significance was set at $P \leq 0.05$.

## Results

The present study included 60 patients undergoing spinal anesthesia for various types of operations who were randomly allocated into two groups according to spinal need caliber size (gauge 22 versus gauge 24). The age range and mean age in addition to frequency distribution of patients according to gender are shown in table 1. There was no significant difference in mean age and frequency distribution according to gender between both study groups ($P > 0.05$), table 1. Table 2 shows the frequency distribution of patients according to type of surgical operation.

The Rate of post-spinal puncture headache (PSPH) is shown in table 3. Patients who experienced headache in the first group (gauge 22) were more frequent that those in group 2 (gauge 24), 22 (73.3 %) versus 8 (26.7 %) and the difference was highly significant ($P < 0.001$). In addition, severe headache was only seen in group 1 (gauge 22), table 3.

**Table 1: General characteristics of patients enrolled in the current study**

| **Characteristic** | **Group 1 (Gauge 22) n = 30** | **Group 2 (Gauge 24) n = 30** | **P** |
|---|---|---|---|
| Age (years) | | | |
| Range | 30 - 80 | 38 - 75 | 0.119 † NS |
| Mean ±SD | 51.60 ±14.02 | 56.87 ±11.63 | |
| Gender | | | |
| Male, n (%) | 22 (73.3 %) | 24 (80.0 %) | 0.542 ¥ NS |
| Female, n (%) | 8 (26.7 %) | 6 (20.0 %) | |

n: number of cases; SD: standard deviation; †: independent samples t-test; ¥: Chi-square test; NS: not significant at P > 0.05

**Table 2: Types of operations according to group**

| **Operation type** | **Group 1 (Gauge 22) n = 30** | **Group 2 (Gauge 24) n = 30** |
|---|---|---|
| Anal fissure | 0 (0.0 %) | 2 (6.7 %) |
| Bilateral inguinal hernia | 0 (0.0 %) | 2 (6.7 %) |
| Cesarean section | 4 (13.3 %) | 2 (6.7 %) |
| Fistula in ano | 0 (0.0 %) | 4 (13.3 %) |
| Gluteal mass | 2 (6.7 %) | 0 (0.0 %) |
| Hemorrhoidectomy | 4 (13.3 %) | 2 (6.7 %) |
| Hydrocelectomy | 4 (13.3 %) | 0 (0.0 %) |
| Percutaneous nephrolithotomy | 4 (13.3 %) | 2 (6.7 %) |
| Pilonidal sinus | 2 (6.7 %) | 0 (0.0 %) |
| Prostatectomy | 2 (6.7 %) | 0 (0.0 %) |
| Right inguinal hernia | 2 (6.7 %) | 6 (20.0 %) |
| Total abdominal hysterectomy | 0 (0.0 %) | 2 (6.7 %) |
| Transurethral resection of the prostate (TURP) | 2 (6.7 %) | 0 (0.0 %) |
| Ureteroscopy | 4 (13.3 %) | 4 (13.3 %) |
| Vesical stone | 0 (0.0 %) | 4 (13.3 %) |

**Table 3: Rate of post-spinal puncture headache (PSPH) according to group**

| **Headache** | **Group 1 (Gauge 22) n = 30** | **Group 2 (Gauge 24) n = 30** | **P** |
|---|---|---|---|
| No | 8 (26.7 %) | 22 (73.3 %) | < 0.001 ¥ HS |
| Mild | 10 (33.3 %) | 6 (20.0 %) | |
| Moderate | 6 (20.0 %) | 2 (6.7 %) | |
| Severe | 6 (20.0 %) | 0 (0.0 %) | |

n: number of cases; ¥: Chi-square test "presence versus absence of headache"; HS: highly significant at $P \leq 0.01$

## Discussion

In the current study were able to show that post spinal puncture headache is a relatively common complication in association with spinal anesthesia; however, it was obvious that the rate of this complication and it severity is related to the caliber size of the spinal needle in such a way that smaller needle (24G) was associated with less frequent and less severe headache than large bore needle (22G). Therefore we can suppose that narrow needle is associated with minimum CSF loss and therefore little if any dural traction due to reduce subarachnoid pressure.

The use of a large bore spinal needle has been stated to be a risk factor for development of post-spinal puncture headache (PSPH) in addition to a list of other risk factors (Nath et al., 2018; Veličković et al., 2017). The use of a cutting needle, particularly if rotated or inserted perpendicular to the long axis of the fibers of the dura, while, the use of a narrow caliber pencil-tipped spinal needle reduces the risk. The incidence rate has been estimated to be highly variable in available published medical literature; however, it may be as low as 10% to as high as 40%, but the incidence can be very low when using small size spinal needle (less than or equal to 24 gauge) (Akdemir et al., 2017).

The kind and the width of needle are important factors in PSPH, taking into consideration that research clearly highlights that greater dural damage leads to a higher rate of this complication. Quincke cutting needles are often accompanied by a higher rate of PSPH in comparison with pencil-point or blunt needles. Gisore et al. (2010) and Schmittner et al. (2010) concluded a significantly lower rate of PSPH with pencil-point needles in comparison with Quincke cutting needles (4.5% vs. 24.2%, P = 0.042 and 1.7% vs. 6.6%, P = 0.02), in clear support to our current findings. A modification to the Quincke needle has been introduced, with a cutting point and a double bevel to make a small dural hole followed by hole dilation. A number of previous reports have shown that the wider the needle, the more the incidence of PSPH. In addition it has been shown that the severity of headache is also related to the size of spinal needle. This is also in accordance with our findings.

Based on current study findings and some previous reports, the incidence and severity of post-spinal puncture headache (PSPH) is significantly related to spinal needle caliber size so that narrower needles are associated with less frequent and milder form of headache in comparison with wider bore needles.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Al-Diwaniyah Teaching Hospital and all experiments were carried out in accordance with

approved guidelines.

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# The Crime of Establishing a Shell Bank – A Comparative Study

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## Abstract

The establishment of a shell bank is a way to legitimize the funds that are the subject of several serious crimes such as terrorist crimes, human trafficking crimes, drug and arms trafficking crimes and other crimes committed by groups and organizations that engage in very dangerous criminal activities that generate many financial revenues, and thus the establishment of a shell bank provides protection for that money from legal and judicial oversight. The crime of establishing a shell bank is a positive crime, as it occurs only with positive behavior issued by the perpetrator. In addition, this crime is an intentional crime. The mens rea of which is only achieved through the availability of criminal intent with both its elements of knowledge and will.Likewise, the crime of establishing a shell bank is like any crime for which establishment two elements are required, namely the corpus delicti and the mens rea, and it also requires the availability of a special pillar represented by the crime scene, which is the shell bank.

***Keywords:*** *Comparative Study, Bank, Crime*

## Introduction

The crime of establishing a shell bank is a form of money laundering, as the Iraqi legislator stipulated this crime and [1] organized its provisions in the Anti-Money Laundering and Counter -Terrorist Financing Law no. (39) of the year 201. Hence, researching the topic of the crime of establishing a shell bank requires clarifying the importance of the research topic and its problems, as well as defining the scope of the research, its methodology and plan, as follows:

**First: Research Importance:**

The importance of discussing the topic of the crime of establishing a shell bank is evident in the fact that this crime is a serious and emerging one, as it is used as a means to legitimize the money and profits obtained from other criminal activities [2], as despite national and international efforts being made to confront these criminal activities, the perpetrators of these activities are using sophisticated and highly secretive means, including the creation of a shell bank to hide the truth of these criminal activities. Therefore, an analytical study of this crime had to be made. [3]

## Methodology

This research will be based on the comparative analytical approach, so it will be an analytical study of what is the crime of establishing a shell bank, its elements and its punishment by referring to the sources and discussing jurisprudence opinions related to the research topic. As for the comparative study, it is based on the analysis of legal provisions related to the research topic and making a [4] comparison with other legislations. The Iraqi legislator handled the crime of establishing a shell bank in Article (42) of the Anti-Money Laundering and Counter-Terrorist Financing Law in order to uncover the source of the illicit money obtained from criminal activities, and realizing the concept of the crime of establishing a shell bank [5].

**First Theme:**

**The Definition of the Crime of Establishing a Shell Bank**

We will define the crime of establishing a shell bank, which requires a linguistic then a terminological definition, in two parts, as follows:

**Part One:**

**The Linguistic Definition of the Crime of Establishing a Shell Bank**

The crime of establishing a shell bank is a term made up of several words, so we will explain the linguistic meaning of each one of them as follows:

Crime: It linguistically means offense, which is every positive or negative matter punishable by law, whether it is a crime, a misdemeanor, or a felony.

Establishing: The verb establish, established, established, means creating or cause something to exist, for example establishing a company, or establishing a new political regime

Bank: bank, banking The bank in the economy is an institution that performs credit operations, such as accepting deposits, making offers, issuing cash, and facilitating payments.

Shell, sham not real, not genuine. A sham contract is the contract that has no legal existence in spite of its form, as it is fictitious unrealistic. Shame works mean unrealistic fictional works.

**Part Two**

**The Terminological Definition of the Crime of Establishing a Shell Bank**

Legislations, the subject of the comparative study, were devoid of the definition of the crime of establishing a shell bank, and they were satisfied with mentioning its provisions, which is an acceptable course due to the difficulty of establishing a comprehensive collective definition. As for the judiciary, it did not define the crime of establishing a shell bank within the limits of the judicial decisions we reviewed so far.

The Crime of Establishing a Shell Bank in jurisprudence: Criminal jurisprudence did not define such crime. However, it has defined the crime of money laundering, a copy of which is the crime of establishing a shell bank, stating that: (It is a group of operations of an economic nature that aims to change the character of the money, conceal its nature and camouflaging its unlawful source), it also defines it as (the main crime arising from a person's possession of unlawful money as a result of an unlawful act and his intention and act of laundering it). It is also defined as (a financial process that aims to conceal the illicit source of funds and legalize it).

Based on the foregoing, we can set a definition for the crime of establishing a shell bank, and we may say that it is (obtaining a license to establish a bank that does not have a physical presence and is not subject to financial supervision to conceal the reality of the money obtained from criminal activities).

**Second Theme:**

**The Distinctive Nature of the Crime of Establishing a Shell Bank**

The crime of establishing a shell bank has specific characteristics that distinguish it from other crimes. Likewise, the crime of establishing a shell bank is similar to other crimes in certain aspects. However, this similarity does not prevent any difference in other aspects. Therefore, we will address this theme in two parts, the first of which shall address the characteristics of the crime of establishing a shell bank, while the second part shall be about distinguishing the crime of establishing a shell bank.

**Part One:**

**The Characteristics of the Crime of Establishing a Shell Bank**

The crime of establishing a shell bank has a number of characteristics that can be summarized as follows:

1. The crime of establishing a shell bank is an intentional crime. The mens rea of which is only achieved through the availability of criminal intent with both its elements that are the recognition of the act that constitutes the crime and the will and determination to do that act and to achieve its consequence.

2. The crime of establishing a shell bank can be classified as a misdemeanor, whereby There are three categories of criminal offence: felony, misdemeanor and infraction. The type of offence determines the severity of the penalty prescribed by the Code. Since the penalty stipulated in the Iraqi legislation for the crime of establishing a shell bank is imprisonment for a period of no less than three years and a fine of no less than ten million dinars and no more than five hundred

million dinars, or one of these two penalties, so it is a misdemeanor.

3. The crime of establishing a shell bank is a crime with positive activity in which the criminal behavior constituting its corpus delicti is positive.

4. The crime of establishing a shell bank is a formality, because its criminal outcome has no external physical presence. Where crimes are divided in terms of criminal outcome into formal crimes and material crimes. Material crimes are the ones that have a material result that causes change in the outside world, while formal crimes are those the outcome of which is invisible and do not have an external physical presence.

**Part Two**

**Distinguishing the Crime of Establishing a Shell Bank.**

The crime of establishing a shell bank is similar to both the crime of opening a shell account and the crime of issuing forged banknotes in certain aspects, and it is different there from in other ways, and this shall be addressed as follows:

**First: The Crime of Establishing a Shell Bank and The Crime of Opening a Shell Account**

The crime of opening a shell account is defined as (hiding the true identity of the money depositor, which prevents identifying the real source of the money in question)

The crime of establishing a shell bank differs from the crime of opening a shell account in terms of the locus delictie. In the crime of establishing a shell bank, the locus delictie is establishing a shell bank that does not have a physical presence. As for the crime of opening a shell account, the locus delictie is depositing money in the name of an unreal person. The two crimes also differ in terms of the perpetrator. In the crime of opening a shell account, it is represented by the financial institution. In the crime of establishing a shell bank, the perpetrator may be a natural person, and it may be a legal person, because the Iraqi legislator has given the right to establish a bank to the person in general, whether natural or legal. Both crimes also differ in terms of the criminal behavior, as the criminal behavior in the crime of establishing a shell bank is represented by the act of (establishment), whereas in the crime of opening a shell account, the criminal behaviour is represented by the act of (opening, accepting or depositing)

**The Crime of Establishing a Shell Bank and The Crime of Issuing Forged banknotes**

The crime of issuing forged banknotes is defined as (falsifying any bond issued by the bank and having a financial value such as loan and investment bonds)

The crime of issuing forged banknotes resembles the crime of establishing a shell bank in the sense that both of them are intentional crimes. The mens rea of which is only achieved through the availability of criminal intent with both its elements that are knowledge and will. Both of them are also positive crimes, as they can never be committed by negative behavior, but rather a positive action must be issued by the perpetrator.

The crime of issuing forged banknotes differs from the crime of establishing a shell bank in terms of the locus delictie. In the crime of establishing a shell bank, the locus delictie is a shell,while in the crime of issuing forged banknotes, the locus delictie is the forged banknotes. The two crimes also differ in terms of the criminalization ground. In the crime of issuing forged banknotes, the criminalization ground is to protect the financial value of these securities and credit for banking operations and securities issued by banks, while the reason for criminalizing the establishment of a shell bank is to disclose the illicit money obtained from criminal activities and to arrest and punish the perpetrators. The two crimes also differ in terms of the crime penalty. The crime of issuing forged bank notes is considered a felony, while the crime of establishing a shell bank is a misdemeanor.

**Second Topic:**

**The Pillars of the Crime of Establishing a Shell Bank**

We will address the pillars of the crime of establishing a shell bank in two parts, the first of which shall be dedicated to the special pillar of crime of establishing a shell bank, while the second part shall talk about the general pillars of the crime of establishing a shell bank.

**First Theme:**

**The Special Pillar of the Crime of Establishing a Shell Bank**

For the crime of establishing a shell bank to exist it requires the availability of a special pillar in addition to the general pillars. The special pillar of this crime is that the crime locus delictie be a shell bank, as stipulated by the Iraqi Legislator in the provisions of Article (42) of the Iraqi Anti-Money Laundering and Counter-Terrorist Financing Law, which states that: " Any person who establishes a shell bank in Iraq shall be punished with imprisonment for no less than three (3) years and a fine of no less than ten million (ID 10,000,000) and up to one hundred million (ID 100,000,000), or either one of both sanctions." It is legally settled by the provisions of paragraph (20) of Article (1) of the Iraqi Anti-Money Laundering and Counter-Terrorist Financing Law has defined the shell bank as it states that: "20. Shell Bank: a bank that is incorporated or licensed in a country or jurisdiction in which it has no physical presence and that is not affiliated with a regulated financial group subject to effective banking regulation and supervision." It has also been defined by Article (1) of the Kuwaiti Anti-Money Laundering and Counter-Terrorist Financing Law, which states that: "Shell bank: a bank that is incorporated or licensed in a country or jurisdiction in which it has no physical presence and that is not affiliated with a regulated financial group subject to effective consolidated supervision." It has also been defined by Article (3) of the Sudanese Anti-Money Laundering and Counter-Terrorist Financing Law of the year 2014, which states that: "Shell Bank: the bank that does not have a physical presence in the country in which it was established and obtained a license there from, and who is not affiliated to any financial group subject to unified and effective banking regulation and supervision."

It is worth mentioning that the meaning of the real bank and what are the legal conditions that are to be met there by, which the shell bank lacks must be determined. The Iraqi legislator has defined the bank in Article (1) of the Iraqi Banking Law as " a person holding a license or permit under the Banking Law to engage in banking business and other banking activities in accordance with the amended Governmental Companies Law no. 22 of the year 1997" The Kuwaiti legislator has also defined it in paragraph (1) of Article (1) of the Kuwaiti legislator in paragraph (1) of Article (1) of the Decree of Financial Stability in the State for the year 2009 as it stipulated that as it stipulated that: " Banks: The Kuwaiti banks registered with Central Bank of Kuwait." it has been also defined by Article (4) of the Sudanese Banking Work Regulation Law of 2004, stipulating that: "Bank: means any institution registered under the provisions of the Companies Act of 1925 or an institution or body established by law or any foreign bank licensed to conduct banking business under this law." Then, the establishment of the bank requires submitting an application to the Central Bank of Iraq to obtain a license for incorporation, and the Central Bank shall grant permission to establish the bank after verifying the authenticity of the information provided pursuant to Articles (5,6) of the Banking Law as well as verifying the identity of the applicant and the owner as a valid decent person, after pledging that the bank will have a fixed physical presence in Iraq; moreover, the licensed bank must be subject to banking supervision.

Based on the foregoing, the shell bank lacks the most important conditions for the bank establishment, which is that the bank must a fixed physical presence in Iraq and that it must do banking activities that are the reason for granting the license. In addition, the shell bank is not subject to banking supervision.

## Conclusion

After investigating the research subject (The Crime of Establishing a Shell Bank - A Comparative Study) is completed, we have reached a number of conclusions and recommendations, the most important of which are included hereinafter.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Faculty of Dentistry and all experiments were carried out in accordance with approved guidelines.

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# Prevalence Rate of Hepatitis C virus (HCV) and Hepatitis B virus (HBV) Infection in Iraqi Patients on Hemodialysis: Cross Sectional Study

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## Abstract

**Background:** Globally, the prevalence rate of chronic HCV infection is highly variable and it is estimated to range from 5 % up to 60 %. In the United States, it has been estimated that the prevalence rate of HCV in patients on hemodialysis is 5 times as that seen in the general population; the prevalence rate in those patients has been approximately 8 %. Hepatitis B virus infection was also a common health issue affecting patients on hemodialysis; however, a great reduction in the incidence rate of HBV in those patients has been noticed over that last decades. This reduction in the incidence of HBV has been attributed to vaccination, the use of erythropoietin instead of frequent blood transfusion for treatment of anemia and screening of blood donors.

**Aim of the study:** the current study was planned and carried out aiming at exploring the prevalence rates of both HBV and HCV in patients and hemodialysis.

**Patients and methods:** The current cross sectional study was based on the inclusion of 160 patients with chronic renal failure and on regular hemodialysis. The study was carried out in the dialysis unit at Adiwaniyah Teaching Hospital, Adiwaniyah Province, mid-Euphrates region of Iraq. The study started on the second of January 2019 and Ended on the 15$^{th}$ of September 2019. From each patient, a 5 ml sample of venous blood was obtained and send to the central Laboratory of Adiwaniyah Teaching Hospital for purpose of serologic identification of HBV and HCV infection in addition to estimation of both blood urea and serum creatinine.

**Results:** HCV was detected in 34 (21.2 %), while HBV was seen in 2 (1.2 %) and combined HBV and HCV infection was observed in 2 (1.2 %). According to serologic method, 122 (76.2 %) were free of HCV or HBV infection.

**Conclusion:** HCV was far more frequent than HBV infection in Iraqi patients with hemodialysis with prevalence rates of 21.2 % versus 1.2 %, respectively.

***Key words:*** *Prevalence, HCV, HBV, Iraqi patients, hemodialysis*

## Introduction

Based on available laboratory investigations routinely done for hemodialysis patients, Hepatitis C virus infection appears to be highly prevalent in comparison with the general population [(1)]. Besides, the existence of such chronic HCV infection is associated with morbidity in patients on hemodialysis [(1)]. The principal risk factors for HCV infection in those patients are contact with blood and blood products [(1)]. Globally, the prevalence rate of chronic HCV infection is highly variable and it is estimated to range from 5 % up to 60 % [(2- 3)]. In the United States, it has been estimated that the prevalence rate of HCV in patients on hemodialysis is 5 times as that seen in the general population; the prevalence rate in those patients has been approximately 8 % [(4)]. The incidence rate of HCV in patients on hemodialysis in Europe is also higher than that in the general population with considerable variation in the incidence rates from region to region, but in general it is lowest in northern European countries such as England

and Sweden and lowest in southern European countries such as Italy and Spain [5- 6].

Hepatitis B virus infection was also a common health issue affecting patients on hemodialysis; however, a great reduction in the incidence rate of HBV in those patients has been noticed over that last decades. This reduction in the incidence of HBV has been attributed to vaccination, the use of erythropoietin instead of frequent blood transfusion for treatment of anemia and screening of blood donors. Nevertheless, the risk of acquiring HBV by hemodialysis patients is still high because of several risk factors such as shared hemodialysis devices, increased exposure to blood and blood products, immunodeficiency state and frequent skin breaching. Indeed, acute infection with HBV in dialysis patients is usually mild and frequently asymptomatic; however, significant proportion of patients may progress to carrier state or chronic hepatic disease, increased risk of cirrhosis and even liver cancer [7- 8].

Here in Mid-Euphrates region of Iraq, there are limited resources with respect to hemodialysis unit in Adiwaniayh Teaching Hospital at Adiwaniayh province. The number of hemodialysis devices and related equipments is limited and vaccination against HBV is frequently unavailable. For these reasons, we expect to find a relatively high prevalence rate of HBV and HCV infections in Iraqi patients on hemodialysis. Therefore, the current study was planned and carried out aiming at exploring the prevalence rates of both HBV and HCV in patients and hemodialysis.

## Patients and Method

The current cross sectional study was based on the inclusion of 160 patients with chronic renal failure and on regular hemodialysis. The study was carried out in the dialysis unit at Adiwaniyah Teaching Hospital, Adiwaniyah Province, mid-Euphrates region of Iraq. Patients were randomly selected in such a way that the first patient was chosen according to a random digit generated by computer software and the rest of patients were selected as every other 3 patients. The study started on the second of January 2019 and Ended on the 15$^{th}$ of September 2019.

The main variables included in the present study were age, gender, cause of renal failure, blood urea and serum creatinine before and after the last session of dialysis in addition to the primary outcome which was serologic evidence of HBV and HCV infection. From each patient, a 5 ml sample of venous blood was obtained and send to the central Laboratory of Adiwaniyah Teaching Hospital for purpose of serologic identification of HBV and HCV infection in addition to estimation of both blood urea and serum creatinine before hemodialysis session. Another sample of venous blood was obtained few hours after the end of dialysis session in order to measure blood urea and serum creatinine after hemodialysis. The same routine laboratory methods that are usually carried out in central laboratory were performed in the current study.

Data were then transformed into an SPSS spread sheet (IBM, Chicago, USA, version 23). Categorical data were expressed as number and percentage, whereas numeric data were expressed as mean, standard deviation and range. Paired t-test was used to study difference in mean blood urea and serum creatinine before and after hemodialysis sessions. The level of significance was considered at $P \leq 0.05$.

The study was approved by institutional ethical approval committee and verbal consent was obtained from each participants. In addition to formal official agreement obtained from Health Directorate in Adiwaniyah province.

## Results

The general characteristics of patients enrolled in the current study are shown in table 1. The mean age of patients was 47.65 ±16.43 years with a wide range of age of 5 to 86 years. The study included 83 (51.9 %) males and 77 (48.1 %) females. According to blood group, the most frequent group was O+, 37 (23.1 %), followed by B+, 37 (23.1 %) and then by A+, 31 (19.4 %), whereas, the least frequent blood group was AB-, 1 (0.6 %), as shown in table 1. The most frequent cause of renal failure was systemic hypertension, 49 (30.6 %) followed by diabetes mellitus, 17 (10.6 %); other causes are shown in table. In 34 (21.3 %), no cause was identified.

Prevalence rate of hepatitis C virus (HCV) and hepatitis B virus (HBV) infection in patients on hemodialysis is shown in table 2. HCV was detected in 34 (21.2 %), while HBV was seen in 2 (1.2 %) and

combined HBV and HCV infection was observed in 2 (1.2 %). According to serologic method, 122 (76.2 %) were free of HCV or HBV infection.

Mean blood urea before dialysis was 250.90 ±52.81 mg/dl and it was reduced following dialysis to 100.38 ±16.97 mg/dl. Mean serum creatinine before dialysis was 12.43 ±1.75 mg/dl and it was reduced following dialysis to 9.88 ±1.78 mg/dl. The reduction in both serum creatinine and blood urea was highly significant ($P < 0.001$); however, normal serum creatinine or blood urea levels were not achieved in any participant, as shown in table 3.

**Table 1: General characteristics of the study sample**

| **Characteristic** | **Value** |
|---|---|
| Age (years) | |
| Mean ±SD | 47.65 ±16.43 |
| Range | 5 -86 |
| **Gender** | |
| Male, n (%) | 83 (51.9 %) |
| Female, n (%) | 77 (48.1 %) |
| **Blood group** | |
| A+, n (%) | 31 (19.4 %) |
| B+, n (%) | 37 (23.1 %) |
| AB+, n (%) | 9 (5.6 %) |
| O+, n (%) | 71 (44.4 %) |
| A-, n (%) | 2 (1.2 %) |
| B-, n (%) | 3 (1.9 %) |
| AB-, n (%) | 1 (0.6 %) |
| O-, n (%) | 6 (3.8 %) |
| **Cause** | |
| Systemic hypertension, n (%) | 49 (30.6 %) |
| Diabetes mellitus, n (%) | 17 (10.6 %) |
| Systemic hypertension + Diabetes mellitus, n (%) | 13 (8.1 %) |
| Chronic infection, n (%) | 12 (7.5 %) |
| Renal stone, n (%) | 8 (5.0 %) |
| Shock, n (%) | 7 (4.4 %) |
| Systemic Lupus Erythematosus, n (%) | 2 (1.3 %) |
| Iatrogenic, n (%) | 8 (5.0 %) |
| Glomerulonephritis, n (%) | 3 (1.9 %) |
| Cardiac failure, n (%) | 2 (1.3 %) |
| Congenital, n (%) | 2 (1.3 %) |
| Benign Prostatic Hyperplasia, n (%) | 3 (1.9 %) |
| No identifiable cause, n (%) | 34 (21.3 %) |

n: number of cases; SD: standard deviation

**Table 2: Prevalence rate of hepatitis C virus (HCV) and hepatitis B virus (HBV) infection in patients on hemodialysis**

| Characteristic | n | % |
|---|---|---|
| HCV | 34 | 21.2 |
| HBV | 2 | 1.2 |
| HBV and HCV | 2 | 1.2 |
| Negative | 122 | 76.2 |

HCV: hepatitis C virus; HBV: hepatitis B virus

**Table 3: Blood urea and serum creatinine before and after hemodialysis**

| Characteristic | | Before dialysis | After dialysis | P † |
|---|---|---|---|---|
| Blood Urea | Mean ± SD | 250.90 ±52.81 | 100.38 ±16.97 | < 0.001 HS |
| | Range | 133 -413 | 66 -157 | |
| Serum Creatinine | Mean ± SD | 12.43 ±1.75 | 9.88 ±1.78 | < 0.001 HS |
| | Range | 6.6 -16.1 | 4.6 -13.7 | |

SD: standard deviation; †: Paired sample t-test; HS: highly significant at $P \leq 0.01$

## Discussion

The advent of hemodialysis has dramatically improved the quality of life of patients with chronic renal failure since it has extended their life span and reduced significantly complications associated with chronic renal failure. However, the problem of contact with blood and blood products accompanying hemodialysis has resulted in substantial increase in the prevalence rate of HCV and HBV infection in those patients.

Here in Iraq and particularly in the mid-Euphrates region of Iraq, we suffer shortage in resources and equipments related to hemodialysis. Therefore, a relatively large number of patients share limited number of hemodialysis devices and equipments. In addition, to the limitation in screening programs related to detection of infected blood and blood products in the available blood bank within our relatively poor province. Therefore, we expect to see a relatively high prevalence rate of HCV and HBV infection in patients undergoing regular hemodialysis.

For those reasons the current cross sectional study was planned and conducted in the hemodialysis unit of Adiwaniayh Teaching Hospital. One limitation was the unavailability of molecular diagnostic PCR method for more accurate detection of HCV and HBV genome in the blood of patients undergoing dialysis, thus we depend for identification of these viruses on the available routine serological methods in the central hospital laboratory.

The current study showed that HCV infection prevalence rate was 21.2 %, whereas, that of HBV was 1.2 %. The present findings suggested a higher prevalence rate for HCV in hemodialysis patients than that reported in the United States (8 %) (4, 9). In addition it is more than that reported in Sweden and England, 8.8 % and 2 %, respectively (5, 6). However, it approaches the reported prevalence rate in Spain, Italy and Turkey, 25 %, 27 % and 30 % (5, 6). Therefore, it appears that in our patients, the prevalence rate of HCV is among highest levels worldwide. This may be attributed to limited number of equipments that are shared by large number

of hemodialysis patients. In addition, it may be attributed to less proper screening of blood and blood products for HCV infection in the available local blood bank. In the currents study, on the other hand, the prevalence rates of HBV infection alone or in combination with HCV were relatively small, 2 % and 2%, respectively. Indeed, these figures are very close to what was reported by other authors in other regions of the world. For example, the estimated prevalence of HBV alone in hemodialysis patients in North India was 1.5 % while co-infection with both HBV and HCV was seen in 0.8% (10). Co-infection with both HBV and HCV was reported from various studies to range from 0.8 % up to 37 % (10-16).

Indeed, it has been stated that approximately 2 % of all mortality in hemodialysis patients are attributed to concomitant viral infection. Therefore, efforts should be made by our health institutes in order to minimize to a lesser degree the prevalence rate of HCV and HBV infection in our hemodialysis patients. These efforts should be mainly directed toward provision of a larger number of hemodialysis equipments to minimize sharing such equipments among large number of patients and also efforts should be directed toward screening of blood and blood products for infectious agents and particular for HCV and HBV.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Al-Diwaniyah teaching hospital and all experiments were carried out in accordance with approved guidelines.

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# Impact of Mass Media upon Juvenile Delinquency in Basra Central Prison and AL- Maqal Police Station

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## Abstract

**Aim:** This study aimed to determine the impact of mass media upon juvenile delinquency in Basra Central Prison and AL- Maqal Police Station

**Subjects and Methods:** A descriptive analytic study design was carried out at juvenile delinquency in Basra Central Prison and AL- Maqal Police Station from 3rd February 2019 until 4th April 2019 in AL-Maqal Police Station and 14th April 2019 until 14th May 2019 in Basra Central Prison. Non – probability (purposive) sample of 100 juveniles who were Basra Central Prison and AL- Maqal Police Station were selected. To know the impact of mass media upon juvenile delinquency using several measures are Content-based Media Exposure Scale (C-ME), International Self-Report Delinquency Questionnaire (ISRD), and Subtypes of Antisocial Behavior questionnaire (STAB) of 60 items of statements that measure impact mass media on juvenile's behavior; and these statements are loaded into seven dimensions including social; psychological; ethical; political; economic; religious; and violent. Reliability of instrument was determined through the use of Alpha Cronbach approach and the instrument validity was determined through a panel of experts. The analysis of the data was used descriptive statistics frequencies, percentages, mean, standard deviation and Analysis of Variance (ANOVA). In order to assess the impact of mass media upon juvenile delinquency.

**Results**: The findings of the present study reveal that indicate to high percentage unsatisfactory behavior (44%) in social and psychological status, (53%) in violent status, while impact upon ethical, political, economic and religious unsatisfactory behaviors have low than third, the total percentage of unsatisfactory behavior of all sample as (28.3%)**.**

**Conclusion:** The study concluded that the unsatisfactory behavior level of (social, psychological, ethical, political, economic, religious, and violent) dimensions were moderate of juvenile delinquency.

***Keyword:*** *Impact; Mass Media; Juvenile Delinquency; Prison; Police Station.*

## Introduction

Mass media is a means of communication that have major role to widespread, communicate information and ideas and influence large number of people in a short duration. Therefore, advances in technology and technical capacity make mass media reach to most remote parts of the world [14] . Every media messages are composed of many elements like information, facts, images, sounds, beliefs, attitude, and events, individuals acquire information and store it in their memory. During media exposures, the media messages can activate some elements that already exists in the individual that are applicable through used the skills of creating something in individuals or recall of previously learned elements or incorporate these elements with others; this new information is likely to trigger negative attitudes or changes in behavior, when occur repeated exposures of the media gradually and continually making these elements more fixed and harder to change that become as individuals' behavioral patterns . This attitudes or effects might can show up immediately (during an exposure or immediately after the exposure to the media message), or it can take a long time to show up, or it can last a long

time, or it can be temporary and disappear after a few seconds [11]. All people live in a society that depends on communication and information to do daily activities in the right direction, media can be present stories or issues in dramatic ways through flow of the undesirable things that covered politics issues, stories of legends, crimes and detective cases. That are unrestricted of audience and contain on amount of vulgarity, nudity and brutality with perfect blend of drama, comedy thrill, horror, emotions, action, songs or dance and romance to earning a place in juvenile's heart and mind and obscured flow good things like love, altruism, happiness, and valuable information [12]. Many juveniles have problems and are getting into trouble, deal with pressures among friends and family, poverty, violence, parental problems, and gangs, truancy, a fight in school, drug or alcohol ingestion, gender, values, or ethnical, difficulty dealing with past traumas like abuse. Juvenile's independence, sometimes all these conflicts result in behavior problems, many this factors put juveniles and families at risk for juvenile delinquency and media violence can interact negatively with a juvenile's developing path of delinquency, the juvenile will apply the learned behavior at school, community, environment and attempts to force his will or assert his pride [5]. Juvenile delinquency is present in several countries around the world, juvenile offending increases during puberty, peaks in middle adolescence that engage or tendency in antisocial, aggressive behavior [1]. It is conduct that is beyond control and subject to legal action by the juvenile that is be out of line with the norms and values of society due to the misleading information from the media are full of scenes of hatred, violence, aggression and extremism that exposing to juveniles with over engaged in it used. It has a negative impact on individual, family, and society, that involve on various types of behaviors with it has multiple motivations, stimuli and consequences. In very simple words, this phenomenon leads to growing and cultivates to tendency of delinquency which threatens the peace of the society to pursue individual interests. The delinquency considers as one of the most contemporary social problems, not only in developing countries as Iraq but also in developed countries [3]. Juveniles commit acts of crime response to a specific motivation according personal propensities and environmental inducements, the media content have a lot of temptations through stimulate or give simple or complex ideas, and the individuals develop, and complete these ideas with make these ideas as a part of life. Therefore, media may be make unacceptable behavior of individuals make acceptable or desirable by cover negative behavior that the juveniles have responds and interaction to easily that lead to conduct or wrongful act that does not acceptable or incompatible to the moral or legal standards of community like obscenity, pilfering, loitering, gambling, drug abuse, begging [2], robbery, breach of trust, cheating, extortion, possession of dangerous drugs, murder, burglary, fraud [8], due to juveniles are not yet mature to distinguish or desire to selection the wrong or right of ability to self-control with engage or imitation of content the mass media [15].

## Materials and Method

A descriptive analytic study design was carried out at juvenile delinquency in Basra Central Prison and AL- Maqal Police Station from 3rd February 2019 until 4th April 2019 in AL-Maqal Police Station and 14th April 2019 until 14th May 2019 in Basra Central Prison. Non – probability (purposive) sample of 100 juveniles who were Basra Central Prison and AL-Maqal Police Station were selected. These prisoners were selected according to the following criteria: both sexes of prisoners (males and females); delinquent who were temporarily detained in police station convicted of crime, felony, or misdemeanor who is awaiting trial; and delinquent convicted of felonies or crime for punishment or rehabilitation convicted of misdemeanors and major offenses in central prison; juveniles who were at 14-17 years. For the purpose of the present study a questionnaire was designed and developed by the researcher which consists of four parts: The first part of the questionnaire concerned with determination of the sociodemographic characteristics of the sample, and the second part was habits and patterns of mass media; the third part was offenses committed by the juvenile; while last part was effect mass media on juvenile. Reliability of instrument was determined through the use of Alpha Cronbach approach (r = 0.943), and the instrument validity was determined through a panel of (19) experts. In order to achieve the early stated objectives, the data of the study were analyzed through the use of Statistical Package of social sciences (SPSS) version 24 through statistical procedures that includes: frequency, percentage, Mean of score, standard deviation, and Analysis of Variance (ANOVA).

## Results

**Table (1) Distribution of the samples by their sociodemographic characteristics of delinquent**

| No. | Variables N=100 | | Frequency | Percentage % |
|---|---|---|---|---|
| 1 | Age | 14-15 | 41 | 41% |
| | | 16-17 | 59 | 59% |
| | | Total | 100 | 100% |
| 2 | Gender | Male | 82 | 82% |
| | | Female | 18 | 18% |
| | | Total | 100 | 100% |
| 3 | Residence | Rural | 23 | 23% |
| | | Urban | 77 | 77% |
| | | Total | 100 | 100% |
| 4 | Residence Area | Slum Houses | 51 | 51% |
| | | Legal Houses | 49 | 49% |
| | | Total | 100 | 100% |
| 5 | School Status | Continuous | 15 | 15% |
| | | Interrupted | 64 | 64% |
| | | Did not Enter at School | 21 | 21% |
| | | Total | 100 | 100% |
| 6 | Socio-Economic Status | High | 4 | 4% |
| | | Middle | 75 | 75% |
| | | Low | 21 | 21% |
| | | Total | 100 | 100% |

**F= Frequency, %= Percentage**

Table (1) The results revealed that the majority of the samples (59%) at age 16-17 year; were male (82%); were living in urban area (77%) in slum houses (51%) have interrupted at school (64%); and middle socioeconomic status (75%).

**Table (2) Distribution of the Study Sample by their Habits and Patterns of Mass Media**

| No. | Habits and Patterns of Mass Media | Frequency | Percentage |
|---|---|---|---|
| 1 | Read Books, Magazines Newspapers | 4 | 4% |
| 2 | Watch Television | 98 | 98% |
| 3 | Listen Radio | 21 | 21% |
| 4 | Use the Mobile | 95 | 95% |
| 5 | Use the Internet | 86 | 86% |
| 6 | Use the Personal Computer | 6 | 6% |
| 7 | Watch the Cinema and Theater | 0 | 0% |

**F= Frequency, %= Percentage**

Table (2) The results revealed that the samples of habits and patterns of mass media were (98%) watch television; (95%) use the mobile; (86%) use the internet; (21%) listen radio; (6%) use the personal computer, while (0%) were watch the cinema and theater.

**Table (3) Distribution of the Study Sample the Offenses and Misdemeanor Committed by the Juveniles**

| No. | Types of Offenses and Misdemeanor Committed by the Juveniles | Frequency | Percentage |
|---|---|---|---|
| 1 | Theft | 29 | 29% |
| 2 | Rape | 13 | 13% |
| 3 | Drug Abuse | 21 | 21% |
| 4 | Murder | 17 | 17% |
| 5 | Beatings | 4 | 4% |
| 6 | Kidnapping | 2 | 2% |
| 7 | Threat | 1 | 1% |
| 8 | Vagrancy | 5 | 5% |
| 9 | Motorcycle/ Car Accidents | 0 | 0% |
| 10 | Forgery | 5 | 5% |
| 11 | Cheating | 0 | 0% |
| 12 | Betrayal | 2 | 2% |
| 13 | Sabotage | 1 | 1% |
| 14 | Total | 100 | 100% |

**F= Frequency, %= Percentage**

Table (3) The results revealed that the samples of types of offenses and misdemeanor committed by the Juveniles that indicate to (29%) theft; (21%) drug abuse; (17%) murder; (13%) rape; (5%) were vagrancy and forgery; while were (0%) motorcycle/ car accidents and cheating.

**Table (4) Assessment Juvenile's Behavior Levels and Test the Impact of Mass Media upon Juveniles among Study Group.**

| No. | Item | Juvenile's Behavior Levels | | | Total |
|---|---|---|---|---|---|
| | | Unsatisfactory | Moderate | Good | |
| 1 | Social and Psychological | 43% | 40% | 17% | 100% |
| 2 | Ethical Status | 23% | 34% | 43% | 100% |
| 3 | Political | 8% | 18% | 74% | 100% |
| 4 | Economic Status | 32% | 29% | 39% | 100% |
| 5 | Religious Status | 18% | 35% | 47% | 100% |
| 6 | Violent Effect | 53% | 34% | 13% | 100% |
| 7 | General Negative Effects | 21% | 53% | 26% | 100% |
| 8 | Total Juvenile's Behavior | 28.3% | 34.7% | 37% | 100% |

**F= Frequency, %= Percentage**

Table (4) The results revealed that the samples of juvenile's behavior levels that indicate to high percentage unsatisfactory behavior (43%) were social and psychological status; (53%) were violent status; while (28.3%) were total juvenile's behavior as unsatisfactory behavior.

## Discussion

The results revealed that the majority of the samples (59%) at age 16-17 year, while 14-15 year were (41%); more than three-quarters (82%) the samples were male and the rest of the sample were females; more than three-quarters (77%) were living in urban area, while were little more than half (51%) living in slum houses; the majority of the samples have interrupted at school (64%) and third (21%) the juveniles were did not enter at school; with three-quarters (75%) of juvenile's families have middle socioeconomic status, while (21%) were juvenile's families have low socioeconomic status. Concerning the results of the habits and patterns of mass media before enter the prison, the juveniles were (98%) watch television; (95%) use the mobile; (86%) use the internet, this finding agrees and supported with results obtained from study done by (Mangwere et al, 2013) it indicates to more use the juveniles of mass media are watch television (100%), use the mobile (72%) and use the internet (56%); while listen radio were (21%); (6%) were used the personal computer, while (0%) were watch the cinema and theater of study sample.

Regarding the types of offenses and misdemeanor committed by the Juveniles that indicate to (29%) theft; (21%) drug abuse; (17%) murder; (13%) rape; (5%) were vagrancy and forgery; while were (0%) motorcycle/ car accidents and cheating. this finding agrees and support with results obtained from study done by (Hameed, 2011); reports indicate theft (38.13%), drug abuse (17.79%), also this finding agree with results obtained from study (Chowdhury et al, 2012) that indicate to theft (47.37%) and murder (36.84%)and other commit a misdemeanor. This result due to the juveniles attract to delinquent behavior due to inspired by media.

Concerning the juvenile's behavior levels that indicate to high percentage unsatisfactory behavior (43%) were social and psychological status; (53%) were violent status; while (28.3%) were total juvenile's behavior as unsatisfactory behavior. This finding agree with results obtained from studies (Helles and Mahdi, 2010); (Saleem et al, 2013) and (Hammond and Ioannou, 2015) all these studies indicate to high unsatisfactory behavior in social and psychological and violent status of delinquency juveniles.

## Conclusions

The findings of the present study conclude that the mass media have impact upon juveniles that lead to unsatisfactory juvenile's behavior in social, psychological status with occur violent effect that lead the juveniles to broken the law and then delinquency.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Ministry of Health and all experiments were carried out in accordance with approved guidelines.

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# Evaluation of the Quality of Primary Health Care Services for Adolescents With Chronic Illness in Kirkuk City

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## Abstract

**Background:** Providing interventions, and implementing of best-practice care for patients with chronic diseases is of greatest challenges currently facing primary care providers. This study aimed to evaluate the quality of primary health care(PHC)services for adolescents with chronic diseases in Kirkuk city.

**Methodology:** A descriptive (quantitative design) was conducted through (18) primary health care centers (PHCCs) in Kirkuk city. A questionnaires was designed for the purpose of the study. A simple random sample of organization structure PHC services (18) health professional were selected through the use of probability sampling approach. Data were analyzed is performed through the use of descriptive statistical data analysis approach.

**Results:** The overall evaluation of quality of PHC services in Kirkuk city is adequate on (77.7 % : N=14), fair on (16.7 % :N=3) and Inadequate on (5.6%: N=1 ) .Domains such as quality of health service represent high mean of scores on its items, Except on 2 items of Tangibles and on items of Responsiveness 2 on from the quality of PHC are low.

**Conclusion**: The study indicates that the quality of PHC services does not execute impact upon adolescents' health status. This study depict that the evaluate of the quality of PHC services is adequate relative to all of its dimensions of general health status, tangibles, accreditation, responsiveness, assurance and empathy.

***Keywords:*** *Adolescents', Chronic Diseases, Primary Health Care Services.*

## Introduction

The PHC services can control chronic diseases with adolescents' depends on a collaborative relationship between adolescents and clinicians to set goals, develop treatment plans, support patients and families who have the day-to-day care responsibilities. Providing interventions, and Implementing of best-practice care for patients with chronic diseases is one of the greatest challenges currently facing primary care providers[(1)]. Patients with complex chronic diseases often require long-term care from different healthcare services and focusing on the importance of effective primary care to delivering quality healthcare, improving health outcomes, and reducing disparities by professionals care to ensure good quality care[(2)]. Although health technology could improve the ability of primary care. The internal medicine specialists need to help these patients[(3)]. The importance of effective PHC services in delivering quality healthcare, improving outcomes, and reducing disparities of health[(2)].The strategies implemented in practice are still unsystematic about the healthcare need for adolescents with chronic diseases. [(4)]. It has been demonstrated that the use of primary care is associated with improved access to health care services, reduced hospitalizations, cost-effectiveness, and enhanced equity[(5)].To develop satisfaction competency-based and self-management programs for adolescent with chronic diseases and development knowledgeable in both pre-service and in-service management. In addition, it provides guidance for services on how to assess or improve the arrangement of daily care , content, and quality health-care services for adolescents with chronic diseases[(6)]. Also the study used as the basis for

selecting the quality health care services' and recognize main strategic directions for adolescents with special health care needs, especially those with chronic illnesses continuing need specialist services .

## Methodology

A descriptive study used a quantitative design conducted on PHCCs in Kirkuk Governorate. A total of (18) PHCCs are selected for the purpose of the study.

Probability sampling approach (simple random sampling) has been used.

The questioner was comprised of organization structure are on ( 22) item it is comprised such as about: Tangibles, Accreditation, Responsiveness ,Assurance, and Empathy of PHC services**.**

The questionnaire provided a three-point scale:(1)Adequate, (2) Fair, (3), Inadequate.

## Results

**Table (1): Overall Evaluation of the Quality of Primary Health Care Services**

| **Dimensions** | **Adequate** | **Fair** | **Inadequate** |
|---|---|---|---|
| 1. Tangibles | (20 - 14.68)<br>( 11 ) | (14.67- 9.34)<br>( 4 ) | (9.33 - 4)<br>( 3 ) |
| 2. Accreditation | (25 - 19)<br>( 15 ) | (18- 12)<br>( 2 ) | (11 - 5 )<br>( 1 ) |
| 3. Responsiveness | (20-14.68)<br>( 13 ) | (14.67-9.34)<br>( 3 ) | (9.33-4)<br>( 2 ) |
| 4. Assurance | (20 - 14.68)<br>( 17 ) | (14.67- 9.34)<br>( 1 ) | (9.33 - 4)<br>( 0 ) |
| 5. Empathy | (25 - 19)<br>( 15 ) | (18 - 12)<br>( 3 ) | (11 - 5)<br>( 0 ) |
| Overall Evaluation | (110 - 80.33)<br>( 14 ) | (80.32 - 50.67)<br>( 3 ) | (50.66 - 22)<br>( 1 ) |

## Discussion

**The evaluate of the Quality of Primary Health Care Services for Adolescents With Chronic Illness**

Throughout the course of data analysis, the study depicts that the quality of PHC services does not enforce any effect on adolescents' health status (Table 1). The logically driven interpretation for such findings can be presented in a way that as long as the quality of PHC services is adequate for adolescents with chronic diseases they definitely maintain a good level of health status.

Analysis of such quality indicates that the quality of PHC services is adequate with respect to its domains of tangibles, accreditation responsiveness, assurance and empathy (Table 1). Such findings can be interpreted in a way that the PHCCs are concerned about adolescents with chronic diseases. So, they are well equipped to present such health care services to this target segment of the population in the community.

These findings are very well-noted in the high mean of scores on items of the domains of such quality (Table 1). Except on 2 items of Tangibles the nature of

the departments, places of waiting, offices, doctors, and other existing staff matches what you expect in your mind and items of Responsiveness 2 on Patients are not expected to receive immediate service from the quality of PHC staff are low. These items have presented the actual state through which the PHC services are managed and provided.

The quality of service assessment works under the supposition that five dimensions of quality of PHC underlie service quality improved quality of health care has been highlighted an important outcome for the of PHC service is reflected in the official vision of the department.

A sequential exploratory mixed method design is carried out to identify quality determinants for healthcare services for adolescents and young adults with chronic illness based on the perceptions and the experiences of adolescents and young adults themselves. The study uses the initial qualitative phase employed semi-structured in-depth interviews to elicit the elements and determinants of quality of healthcare as identified by adolescents and young adults living with chronic diseases.

The second phase employs a questionnaire developed from the data gathered during the qualitative phase to survey the target population. This is distributed to a larger sample of adolescents and young adults with chronic illnesses or conditions to determine and confirm the relevance of the identified care elements and quality determinants. The study reveals four most important determinants: the provision of young people information relating to all aspects of source of revenue with chronic illness, services that facilitate and encourage independence, services characterized by the organization with the capacity to be both dynamic and responsive, and finally health care professionals knowledgeable and skilled in relation to adolescent-specific issues [7]. da Nóbrega and other colleagues (2017) have discovered in a qualitative study that continuity of care, well data recording system and well-formed follow-up system care considered as the major contributors to a better quality of health care services to adolescents. The global standards are developed based on the needs assessment in conjunction with the analysis of (26) national standards from (25) countries. The final document is reviewed by experts from the WHO regional and country offices, governments, nongovernmental organizations, academia, and development partners. The standards were subsequently tested in Benin and in a regional expert consultation of Latin America and Caribbean countries for their usability [9].

The report highlights the need to strengthen improving PHC, particularly to better manage the large numbers of patients with multiple chronic conditions .It has been reported that the care given to all children, including young adolescents, in health facilities is evidence-based, safe, effective, timely, efficient, equitable and appropriate for their age and stage of development [10]. The WHO has undertaken a systematic review to assess the effectiveness of adolescent health services for adolescents living with chronic diseases compared to standard of care. Young people engaged in adolescent- health services compared to standard care showed small but significant improvements in various outcomes, including health outcomes, health care utilization, uptake, self-efficacy and service acceptability. World Health Organization is recommending that adolescent health services should be implemented in chronic disease services to ensure engagement and improved health outcomes [11].

## Conclusion

The findings depict that the quality of PHC services is adequate relative to all of its dimensions of general health status, tangibles, accreditation, responsiveness, assurance and empathy. The study confirms that the quality of PHC services does not execute impact upon adolescents' health status.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Kirkuk Health Directorate and all experiments were carried out in accordance with approved guidelines.

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# Self-evaluation of Continuing Nursing Education Programs in Kirkuk Health Directorate Hospitals

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## Abstract

**Objective(s):** To self-evaluate Continuing Nursing Education Programs in Kirkuk Health Directorate Hospitals

**Methodology:** A descriptive design, using self-evaluation approach, is employed throughout the present study. A non-probability sample of (251) staff nurse who are recruited from Kirkuk Health Directorate Hospitals; Kirkuk General Hospital and Azady Hospital. A questionnaire is constructed for the purpose of the study which is comprised of (1) part, (6) aspects and (52) item. Content validity and internal consistency reliability are determined for the questionnaire through a pilot study. Data are collected through the use of the questionnaire and structured interview a means of data collection. Data are analyzed through the application of descriptive statistical data analysis approach of frequency, percentage, mean of scores, total scores and ranges.

**Results:** The study indicates that the overall self-evaluation of the Continuing Nursing Education Program in Kirkuk Health Directorate is poor for the majority of the subjects (81.7%) and the mean of scores on items of aspects of self-evaluation of the Continuing Nursing Education Program is low on all items of these aspects.

**Conclusion:** The study concludes that overall self-evaluation of continuing nursing education program is depicted as poor relative to all aspects of continuing nursing education program of program goals, program planning, program performance, program operation and management, program outcomes and program effectiveness.

**Recommendations:** The study recommends that staff nurses should be seriously involved in the self-evaluation of the continuing nursing education programs for the reason that they are considered the consumers of such programs. Further research can be carried out on a large sample size, varied range scale of variables, large sample size and nation-wide continuing nursing education programs.

***Key wards:*** *Self-evaluation, Continuing Nursing Education Program, Kirkuk Health Directorate*

## Introduction

As professions go, nursing is pretty new. Until just more than 150 years ago when Florence Nightingale provided the building blocks for the field -- which included a training school and a nursing guidebook -- anyone who found themselves in the role of caregiver could be considered a nurse. In fact, Nightingale once said that every person must at some time or other of the life becomes a nurse [(1)].

Of course, that is back in the mid-19th century. Over the years, nursing has become a highly respected occupation that requires specific education and training. Not only that, but nurses also provide a wide spectrum of services to patients of all kinds [(2)].

Continuing education is the process that includes all the experiences after the initial training. Is characterized as the set of experiments after the initial training, allowing the worker to maintain, increase or improve

your skills, so that this is consistent with the development of their responsibilities, characterizing, competence and individual attribute. It is a set of continuing education practices, aimed at developing the potential for a change in attitudes and behaviors in the cognitive, affective and psychomotor human being, the prospect of transforming their practice [3].

Continuing nursing education (CNE) denotes to courses precisely for nursing professionals, intended at possession them up-to-date with the state-of-the-art health knowledge. CNE safeguards professional growth and enables re-licensure and certification points in numerous countries. CNE also enlarges nurses' knowledge, skills and attitude while donating to their career development [4].

Continuing education program is any postponement of opportunities for reading, study and training to any person and adult following their attainment of or removal from full time school and/or college program [5].

Nursing is not just a set of specific skills, nor the nurse is only a person trained to perform specific tasks. Nursing is a profession. To be professional and act this way should be given careful consciously and based on their knowledge. Thus, a profession requires extensive education of those who practice and it is important to have a fundamental and theoretical body of knowledge and skills that generates defined standards. Hence the importance of continuing education becomes a key strategy for updating the professionals who are working in the field, bringing new concepts and knowledge relevant to a safer practice and conscious [3].

One of the delights of continuing nursing education is the amusing opportunity it offers for research. The very diversity of learners, content, programming potentials, and instructional strategies provide fertile Fields for investigation. Studies in continuing nursing education may discourse newly identified problems or provide new viewpoints on the study of acquainted problems. The instruments and techniques advanced to conduct these investigations are themselves a basis of possible claims in the delivery of continuing education, for example, in the refinement of needs assessment devices or evaluation strategies. Thus, reports of investigations should be examined on numerous levels: for their donations to knowledge in the field, for applicability to the solution of practical problems, and for the use of study instruments and methodologies for further investigations or in programming [6].

Continuing nursing education (CNE) programs are designed to contribute to nurses' professional development by filling a gap in knowledge, skills, and practice. CNE is also the method through which nursing professionals improve their practice and keep up to date on the latest knowledge and advances in health care. It is important for nurse educators to evaluate the outcomes of CNE programs to make sure the gaps have been addressed. An outcome is defined as the end result of a learning activity measured by evaluation or change in practice [7].

Continuing nursing education and the application of new knowledge to practice are increasingly important means to improve patient care in today's health environment. The willingness and ability to transfer knowledge, skills, and attitudes are critical to improving patient outcomes [8].

The evaluation of continuing nursing education is a vital part of improving the quality of educational activities. This evaluation defines if nurses meet the wanted learning outcomes and offers feedback on ways to advance the educational experiences that eventually progress patient care [6].

Based on the early stated evidence, the present study ought to evaluate the Continuing Nursing Education Programs at hospitals in Kirkuk Health Directorate.

## Methodology

A descriptive design is employed throughout the present study to self-evaluate continuing nursing education programs in Kirkuk Health Directorate from November 3rd 2018 to April 30th 2020.

After receiving the approval of the Council of Nursing College for the study and prior to data collection, proposal and questionnaire of the study have been submitted to the Ministry of Planning Central Statistical Organization and the Ministry of Health and Environment Kirkuk Health Directorate in order to obtain an official permission to carry out the study. The permission, after being granted, is presented to the hospitals to ensure the agreement and cooperation.

The study is conducted at Kirkuk General Hospital and Azady Teaching Hospital in Kirkuk health Directorate. These settings are the designated site for data collection, because all of them are representing the classification of hospitals as general and specialized ones.

A purposive "nonprobability" sample of (251) staff nurse is selected for the present study. All staff nurses, who have participated in the study, have presented with consent form and they are asked to sign the form for their agreements for the participation in the study. All participants are introduced with the study objectives and they are presented with the opportunity of being aware of the study affairs. Such action has been implemented to protect the participants' human rights and facilitate access to them in order to gather the necessary data for the study.

The study instrument consists of the following:

Part I: Self-evaluation of Continuing Nursing Education Program

This part is comprised of the following:

1. Program goals:

This part is comprised of (7) items which are concerned with the program goals. It is evaluated as poor (7-12), fair (13-17) and good (18-21).

2. Program Planning:

This part is comprised of (6) items which are concerned with the program planning. It is evaluated as poor (7-12), fair (13-17) and good (18-21).

3. Performance:

This part is comprised of (7) items which are concerned with the program performance. It is evaluated as poor (10-17), fair (18-24) and good (25-30).

4. Operation and Management:

This part is comprised of (8) which are concerned with program's operation and management. It is evaluated as poor (10-17), fair (18-24) and good (25-30).

5. Program Outcomes:

This part is comprised of (10) item which are concerned with the program outcomes. It is evaluated as poor (10-17), fair (18-24) and good (25-30).

6. Program Effectiveness:

This part is comprised of (8) item which are concerned with the program effectiveness. It is evaluated as poor (8-13), fair (14-18) and good (19-24).

Each one of these aspects is evaluated based on the calculation of the total scores and ranges.

A pilot study is conducted for the determination of the study instrument validity and reliability for the period from February 12$^{th}$ to March 7$^{th}$ 2019.

The content validity of questionnaire is determined by panel of (10) experts who are provided with copy of study instrument and are asked to review and evaluate the instrument for its content clarity and adequacy. Some items are excluded and others are added after taking all the comments and recommendations into consideration. So, the questionnaire is considered adequately valid measure after performing the modifications that are based on the experts' responses.

Internal consistency reliability of the questionnaire is determined through the use of split-half technique and the computation of Cronbach alpha correlation coefficient on responses of (20) staff nurse. The correlation coefficient is (r=0.85) which indicates that the questionnaire is adequately reliable measure.

Data are collected through the use of the study instrument and the structured interview technique as means of data collection for the period from March 10$^{th}$ 2019 to May 8$^{th}$ 2019.

The data are analyzed through the use of descriptive statistical data analysis approach of frequency, percent, mean of scores, total scores and ranges.

## Results

**Table (1): Overall Self-evaluation of the Continuing Nursing Education Program**

| **Poor (52-87)** | | **Fair (88-122)** | | **Good (123-156)** | |
|---|---|---|---|---|---|
| F | % | F | % | F | % |
| 205 | 81.7 | 43 | 17.1 | 3 | 1.2 |

**F: Frequencies, %: Percentages**

This table indicates that such overall self-evaluation of the Continuing Nursing Education Program in Kirkuk Health Directorate is poor for the majority of the subjects (81.7%).

## Discussion

Analysis of overall self-evaluation of the Continuing Nursing Education Program in Kirkuk Health Directorate has indicated that staff nurses have appraised such program as poor for the majority of them. Such finding provides empirical indication that the continuing nursing education program has experienced series of inadequacies with regard to all aspects of the program. Such self-evaluation is noticed in all the poor mean of scores on items of program goals, program planning, program performance, program operation and management, program outcomes and program effectiveness.

Continuing nursing education (CNE) has become essential for the assurance and improvement of quality patient care. CNE includes self-education and directed training activities designed to acquire new knowledge further to that which is acquired through the basic nursing education. It is a process that begins with the end of studies and lasts for the entire life of the individual. A descriptive correlational study investigates the motivating factors for participation of nurses in continuing nursing education (CNE) and their perceptions about the necessity for programs in CNE. The Participation Reasons Scale (PRS) is completed by (475) nurses working in three hospitals in Athens and the Peloponnese region and the socio-demographic data of participants are recorded. The study shows that the majority (62.3%) of the sample showed positive perceptions and attitudes about CNE programs which are based on real needs. Subjects rated all five factors (dimensions) of the PRS as "moderately important" in high percentages, specifically: "Professional improvement and development" 98.9%, "professional service" 91.8%, "collegial learning and interaction" 82.6%, "personal benefits and job security" 91.0%, "professional commitment" 88.4%. "Professional commitment" recorded the highest mean score (4.95±0.744). "Professional improvement and development" correlated positively with "collegial learning and interaction" ($r=0.229$; $p<0.001$) and "personal benefits and job security" ($r=0.115$; $p=0.015$). The study concludes that motives and personal professional attitudes exert a significant effect on the participation of nurses in CNE programs [(9)].

A cross-sectional study with (152) nurses in a public hospital in Pernambuco is carried out to analyze the opinions of nurses on a permanent education program, identifying reasons that influence adherence. The study findings depict that respondents have agreed that lifelong learning improves formation professional. The majority of participants has appreciated the methodology and approves three types of program: in practice simulation room; on the spot; and clinical meeting. The study has found to be essential to consider the opinion of nurses reporting workload after participating in training activities and who prefer to be consulted in advance about the subjects offered. Recognize and value the professional advice shows up relevant for to adopt measures aimed at increasing the effective entry into the program [(10)].

## Conclusion

The study concludes that overall self-evaluation of continuing nursing education program is depicted as poor relative to all aspects of continuing nursing education program of program goals, program planning, program performance, program operation and management, program outcomes and program effectiveness.

## Financial disclosure

There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Kirkuk Health Directorate and all experiments were carried out in accordance with approved guidelines.

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# IL-10(-1082 G/A) Gene Polymorphism in Iraqi Patients with Scabies

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## Abstract

Scabies is one of a neglected parasitic disease. It causes complications that lead to inflammatory and allergic immune response ,Cytokines play an important role in the pathogenesis and disease progression. Various reports have implicated cytokine gene polymorphisms in susceptibility to develop some immune mediated conditions, The purpose of this study was to investigate the association of interleukin -10(IL-10) gene polymorphism with the scabies risk and its effect on IL-10 production . The results revealed that a significant increase (P≤0.05) in levels of IL-10 in patients groups compared with healthy group, also the data found that a statistically higher IL-10 serum levels among carriers of the G allele (G/A heterozygotes or G/G homozygotes vs. A/A homozygotes) in the –1082 G/A IL-10 polymorphism in both scabietic patients and control groups .The frequencies of genotypes GG and GA of IL-10 (1082 G/A) polymorphism were significantly increased(P≤0.05) , whereas genotype AA was decreased in patients than the healthy subjects .IL-10 (1082 G/A) polymorphism was associated with the susceptibility of scabies, thus giving additional support for the genetic basis of this disease

***Keywords:*** *Scabies, Interleukin-10. Genetic polymorphism*

## Introduction

Sarcoptes scabiei var. hominis. is ectoparasitic caused humans scabies ,also is consider ubiquitous disease, with an estimated 300 million infections per annum worldwide[1]. Furthermore, scabies is commonly found within developing countries, low socioeconomic communities and global regions experiencing significant environmental stressors such as during times of war and environmental disasters, [2].Scabies was transmitted by person to person contact, by infected persons interacting with fomites such as clothing, bedding or shared household items that are contaminated with mites or mite eggs that were shed from infected individuals[3] meantime, mites can survive without host survive for 24–36 h ,at room conditions (21°C and 40–80% relative humidity) [4] . The IL-10 gene maps to the junction of 1q31–q32 [5] and this gene is highly polymorphic with a number of single nucleotide polymorphisms in the promoter region ,in addition there is 3 polymorphic susceptible sites found in IL-10 promoter region include -1082(G/A), -592(C/A) and -819(C/T) [6]**.** The aim of this study were to investigate the association between IL-10 G-1082A promoter polymorphism of interleukin-10 gene among some Iraqi scabietic patients using ARMS-PCR technique .

## Materials and Method

1. **Patients and control:**

A total of 60 patients infected with Sarcoptes scabiei var. hominis (25 males and 35 females) and 30 healthy individuals (15 males and 15 females) were included in current study.

2. **Blood samples :**

The blood samples were drown from each patients and healthy subjects(5ml) . The sample was divided into two parts , the first placed in EDTA tube for genetic study, while the other part was kept to clot at room temperature, then centrifuged at 3000 rpm for 10 minutes, after that sera samples were transferred into eppendrof tubes and stored at deep freeze until used .

3. **Laboratory investigations :**

A.**Immunological assays :**

The levels of IL-10 was estimated by ELISA according to the manual procedure of kits provided by Bioassay Technology Laboratory /UK .

**B. PCR amplification**

Genomic DNA was extracted from the blood of scabietic patients and controls using DNA mini kit (favergen-Korea). Interleukin-10 gene was amplified using amplification refractory mutation systems (ARMS)-PCR methodology for IL-10 (1082 GA) according to ]7 [.The set of primers used to amplify various types of polymorphism are summarized in table 1. The PCR amplification was performed in a total volume of 20 µl. (master mix is a premixed ready to use solution containing Taq DNA polymerase, dNTPs, MgCl2 and reaction buffers) supplied by Bioneer company (Korea), 5 µL of genomic DNA, 1µl of each primer (10 pmol/1µL) and 13 µL from nucleases free water for polymorphism IL-10(1082 G/A). Reaction consisted of 10 temperature cycles of denaturation for 15 s at 94◦C, annealing for 50 s at 65◦C and extension for 40 s at 72◦C. Then 25 cycles of denaturation for 20 s at 94◦C, annealing for 50 s at 59◦C, extension for 50 s at 72◦C. Final extension was performed at 72◦C for 7 minutes. Electrophoreses of the PCR product was performed in 2% agarose gel, stained with ethidium bromide and photographed.

**Table (1) Primers of IL-10(-1082 G/A)**

| IL-10(1082 G/A) | Sequences | Product size |
|---|---|---|
| anti-sense primer | 5'-CAG TGC CAA CTG AGA ATT TGG-3' | 258 bp |
| Sense primer G | 5'-CTA CTA AGG CTT CTT TGG GAG-3' | |
| Sense primer A | 5'-ACT ACT AAG GCT TCT TTG GGA A-3' | |

**4.Statistical Analysis:**

The results were analyzed by using SPSS version 24.0 .The data were expressed by means ±standard deviation (±SD) . Multivariable logistic regression was used to determine independent indicators of SNPS and Allels By use OR and CI 95% . All P values were two-tailed, with a value of less than 0.05 considered statistically significant

## Results

The results in table (2) revealed that a significant differences( $P<0.05$) in the levels of IL-10 between patients groups(first infestation and re-infestation) and control group , which reached 251.60±85.82 and 177.23±69.03 pg/ml in first infestation and re-infestation groups respectively, while it was 42.19±14.77 pg/ml in control group .

**Table (2): The levels of IL-10( pg/ml) in patients( first infestation, re- infestation) and control groups .**

| Groups | Mean±S.D. | LSD | p.value |
|---|---|---|---|
| First Infestation | 251.60±85.82 | 32.926 | 0.001 |
| Re infestation | 177.23±69.03 | | |
| Control | 42.19±14.77 | | |

The distribution of IL-10 (-1082 G/A) variants in patients and controls are summarized in tables 3 and figure1. It can be seen that the frequency of GG and GA genotypes in first infestation, re-infestation and control groups which reached 56.7%, 43.3%, 35.5%; 40.0%, 43.3% and 29.0% respectively. It was significantly increased in patients than control, in which GG genotype increased as rate OR=3.834 compared with GA and AA genotypes in studied groups. On the other hand, the frequency of AA genotype in first infestation, re-infestation and control groups was 3.3%,13.3% and35.5% respectively, that decreased in patients compared with control group .The distribution of IL-10 (-1082 G/A) genotypes in first infestation group was AA (homozygous mutant type), GA (heterozygous) in frequencies rate 3.3% and 40.0% respectively, but without significance or odd ratio, also the distribution of IL-10 (-1082 G/A) genotypes in re- infestation group were AA, GA in frequencies rate 13.3% and 43.3% respectively, without significance but OR=1.222, as consider GG reference category .Moreover, the distribution of IL-10 (-1082 G/A) allele in first infestation, re- infestation and control groups were in A allele frequency rate 23.3%, 35.0% and 50.0% respectively, but significantly without OR, while between first infestation and control groups was significant but without OR, in addition between re- infestation and control was non- significant and OR ,in the other hand the distribution of IL-10 (-1082 G/A) allele in first infestation, re- infestation and control groups were G allele frequency rates 76.7%, 65.0% and 50.0% respectively, but significantly with OR=1.815 can consider a risk factor with scabies, while between first infestation and control group was significant with OR=3.286, whereas between re- infestation and control group was non- significant and with OR=1.857.

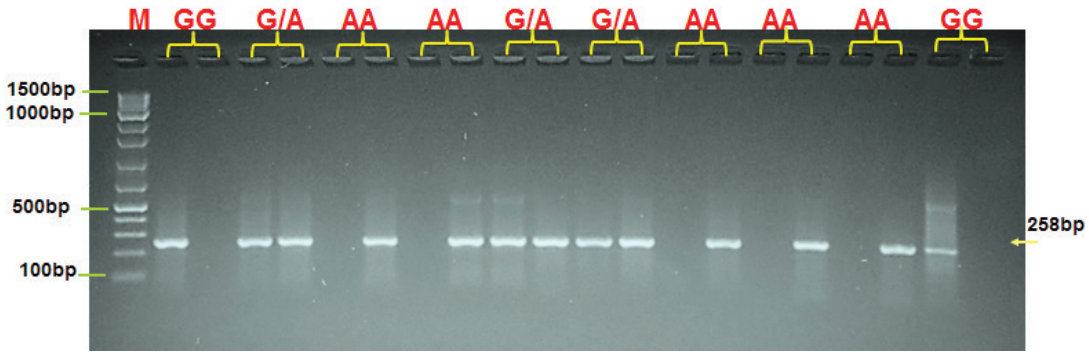


**Figure 1: Agarose gel electrophoresis image that showed the two reaction ARMS-PCR product analysis of IL-10 (1082) (G/A) gene polymorphism. Where M: marker (1500-100bp). The GG wild type homozygote genotype lanes were showed only G allele amplification at 258bp ARMS PCR product size. The AA mutant type homozygote genotype lanes were showed only A allele amplification at 258bp ARMS PCR product size. In addition, the G/A heterozygote genotype lanes were showed G allele and A allele amplification at 258bp and 258bp product size respectively**

**Table(3): Genotype and allele frequencies of IL-10 (−1082) variants in scabietic patients with and control groups**.

| IL-10 SNPS | Study groups | | | Total | P.value. | OR | 95% C.I.for OR | |
|---|---|---|---|---|---|---|---|---|
| | First infestation | Re-infestation | Control | | | | Lower | Upper |
| AA | 1 | 4 | 11 | 16 | 0.100 | 0.648 | 0.387 | 1.086 |
| | 3.3% | 13.3% | 35.5% | 17.6% | 0.011 | 0.059 | 0.007 | 0.522 |
| | | | | | 0.098 | 0.308 | 0.076 | 1.245 |
| | | | | | 0.160 | 0.191 | 0.019 | 1.921 |

***Cont...*** **Table(3): Genotype and allele frequencies of IL-10 (−1082) variants in scabietic patients with and control groups**.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **GA** | 12 | 13 | 9 | 34 | 0.373 | 0.789 | 0.468 | 1.330 |
| | 40.0% | 43.3% | 29.0% | 37.4% | 0.801 | 0.863 | 0.273 | 2.724 |
| | | | | | 0.737 | 1.222 | 0.380 | 3.935 |
| | | | | | 0.522 | 0.706 | 0.243 | 2.050 |
| **GG** | 17 | 13 | 11 | 41 | 0.003 | 3.834* | 1.593 | 9.229 |
| | 56.7% | 43.3% | 35.5% | 45.1% | 0.261 | 1.545 | 0.724 | 3.299 |
| | | | | | 0.683 | 1.182 | 0.529 | 2.638 |
| | | | | | 0.467 | 1.308 | 0.635 | 2.692 |
| **Total** | 30 | 30 | 31 | 91 | | | | |
| | 100.0% | 100.0% | 100.0% | 100.0% | | | | |
| **A** | 14 | 21 | 31 | 66 | 0.003 | 0.551 | 0.374 | 0.811 |
| | 23.3% | 35.0% | 50.0% | 36.3% | 0.003 | 0.304 | 0.140 | 0.663 |
| | | | | | 0.095 | 0.538 | 0.260 | 1.115 |
| | | | | | 0.240 | 0.667 | 0.339 | 1.311 |
| **G** | 46 | 39 | 31 | 116 | 0.003 | 1.815* | 1.232 | 2.675 |
| | 76.7% | 65.0% | 50.0% | 63.7% | 0.003 | 3.286 | 1.509 | 7.155 |
| | | | | | 0.095 | 1.857 | 0.897 | 3.844 |
| | | | | | 0.448 | 1.179 | 0.770 | 1.807 |
| **Total** | 60 | 60 | 62 | 182 | | | | |
| | 100.0% | 100.0% | 100.0% | 100.0% | | | | |

*first infestation/control

*re-infestation/control

*first infestation/re-infestation

The correlation between genotype of IL-10 (1082 G/A) and level of IL-10 in patients and control groups was appeared in table (4) .The results found that a statistically higher serum levels of IL-10 in patients that carry of G allele (G/A heterozygotes or G/G homozygotes), in which the IL-10 levels in first infestation, re-infestation and control groups were 290.96 ,229.22 and 56.93 pg/ml respectively for GG genotype , whereas it was 210.62 ,154.09 and 43.43 pg/ml respectively for GA genotype.

On the other hand, there was lower in level of IL-10 serum in patients that carry of A allele(AA homozygote

mutant type), in which its levels in first infestation, re-infestation and control groups was 74.11 ,83.44 and 27.98 pg/ml respectively for AA genotype .

**Table (4): The correlation between IL-10 (1082 G/A) genotype and IL-10 (pg/ml) level in patients and control groups.**

| IL-10 SNPS | First infestation | | Re-infestation | | Control | | Sig. multivariant |
|---|---|---|---|---|---|---|---|
| | N | Mean ±SD | N | Mean ±SD | N | Mean ±SD | |
| AA | 1 | 74.11±7.25 | 4 | 83.44±29.80 | 11 | 27.98±6.41 | <0.001 |
| GA | 12 | 210.62±57.73 | 13 | 154.09±52.34 | 9 | 43.43±7.84 | |
| GG | 17 | 290.96±78.64 | 13 | 229.22±45.97 | 11 | 56.93±10.44 | |
| Total | 30 | 251.60±85.82 | 30 | 177.23±69.03 | 31 | 42.74±14.84 | |
| SIG. | 0.002 | | <0.001 | | <0.001 | | |

## Discussion

There are a significant differences in the levels of IL-10 between the three groups of the study. ]8 [Illustrated that there was a significant differences in the levels of IL-10 between patients and healthy groups which reached 269±112 pg/ml, also the anti-inflammatory Th2 cytokines such as IL-10 and not the humoral immunity may play a protective role to guard against severe manifestations in human scabies .According to the current study , IL-10 may be regarded a natural regulator of mast cells activator that reduces inflammation and irritability related to allergic reactions. ]9 [showed that the significant increase in levels of IL-10 when used extract mite CO8-stimulated PBMC from control subjects ,were it consistent with previous studies that used whole SM extract remarked that the significantly increased levels of IL-10]10 [ .

Finally ]10 [mentioned that the scabies mites are the source of substances that may delay the hosts primary immune response by stimulating the proliferation of regulatory T cells by their secretion of IL-10 and TGF-β which leads to inhibits an inflammatory/immune reaction to the parasite.

Studies revealed that those individuals may have a genetic predisposition that increasing susceptibility to ordinary scabies (OS), therefore, these genetic changes may not directly cause OS, but may play an important role in its development.

The results of present study found that a statistically higher IL-10 serum levels among carriers of the G allele (G/A heterozygotes or G/G homozygotes vs. A/A homozygotes) in the –1082 G/A IL-10 polymorphism in both scabietic patients and control groups.

The frequencies of genotypes GG and GA of IL-10 (1082 G/A) polymorphism were significantly increased, whereas genotype AA was decreased in scabietic patients than the healthy subjects.

There was no previous studies related with IL-10 (1082 G/A) polymorphism in scabietic patients, therefore, the data of current study of polymorphism of IL-10 (1082 G/A) was compared with the psoriasis and atopic dermatitis patients as dermatologic diseases. ]11 [and ]12 [ reported that the regulation of IL-10 gene, there exists a requirement of consideration of knowing genetic variation among patients or healthy subjects groups, in which the genetic variation can possibly effect the expression of the gene and can considerably act as a genetic marker in disease susceptibility or disease severity. The 1082 G allele of IL-10(−1082G/A) is reported to be associated with high IL-10 gene

expression, as shown in study.

The frequencies of genotypes GG and AA of IL-10 (1082 G/A) polymorphism were significantly increased, whereas genotype GA was decreased in AD patients than the controls, in which the IL-10 (−1082 G/A) polymorphisms are linked with the susceptibility of AD in Saudis and can be regarded a risk factor of IL-10 ]13 [. ]14 [ studied the IL-10 serum level and IL-10 (1082 G/A) polymorphism in patients with AD and suggested that a role of G allele in synthesis of IL-10 in the patients with moderate to severe AD. However, IL-10 being immunosuppressive cytokine inhibits the activity of Th1 and Th2 cell types in human subjects. ]15 [ reported that genotype IL-10 (−1082 AG) is susceptible, whereas IL-10 (−1082 AA) is protective to AD in population of Macedonians, while IL-10-1082 G allele has been considered to be associated with higher production of IL-10 from peripheral mononuclear cells ]16,17,18 [, also ]19 [ revealed that carriers of the IL-10 -1082G allele had higher mucosal IL-10 mRNA than -1082A allele carriers. The current study shows IL-10 having both immunosuppressive in first infestation and protective in re-infestation groups, also GG and GA genotypes with high production of IL-10 belong to gene expression people with G allele transcription factors association tight with mRNA, while to gene expression people with A allele transcription factors association weak with mRNA.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Sciences and all experiments were carried out in accordance with approved guidelines.

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# Assessment of Pregnant Women Knowledge and Practices Concerning Iron Deficiency Anemia at Al-Amara City/Iraq

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## Abstract

**Objectives:** To assess knowledge and practices related to the prevention of iron deficiency anemia among pregnant women and to find an association between their knowledge; practices and socio-demographic variables. **Methodology:** This is an institutional descriptive study conducted on the random selection of six primary healthcare centers in Al-Amara city. A purposive sampling technique was used to select (280) pregnant mothers attending antenatal care service.

**Results**: Almost half of the sample belongs to the primary education level (50.3%) and most of them housewife (56.8%), with low monthly income (71.8%). Over three quarters of the sample had moderate knowledge (76.1%) and their unfavorable practices (75.5%) with regard to iron anemia. The results indicated a high relationship between the knowledge and practice of women with the variables under study (p= 0.000).

**Conclusion:** The study concluded that the majority of participants have insufficient knowledge with moderate practices towards preventing this type of anemia. Health education about foods with a high concentration of iron is an essential step towards reducing iron deficiency anemia in pregnant women.

***Key words:*** *Knowledge, Practice, Iron Deficiency Anemia, Pregnant Women.*

## Introduction

Iron deficiency anemia (IDA) is one of the most common problems between under-nutrition and public health problems worldwide with the highest prevalence in developing countries [(1)]. Anemia of iron means that without a sufficient amount in the blood, the body cannot produce enough red blood cell material to enable it to transport oxygen (Hemoglobin); as a result, the IDA may make women feel tired and restless [(2)]. Pregnant women are at increased risk for IDA due to increased blood volume during pregnancy resulting from increased support to the fetus and placenta. In general, women in childbearing stage suffer from the loss of large amounts of blood due to childbirth or menstruation, which are factors contributing to the development of iron anemia [(3)].

The World Health Organization (WHO) estimates showed in 2011, 32.4 million (38%) of pregnant women, while 496 million (29%) of those who are not pregnant between the ages of 15-49 years suffer from anemia. Moreover, previous studies on IDA have revealed a prevalence of 73.9% in Guyana, 22.1% in Egypt, 39.7% in Kuwait, 78.0% in Liberia, and 50.0% in Bahrain[(4)]. In Iraq, the Nutrition Research Institute showed, through a section of research and studies, the prevalence of iron deficiency among pregnant women 38% and non-pregnant 25%, respectively [(5)]. Iron deficiency in body leads to disorder in metabolism and reduced immunity in the pregnant women and become vulnerable to attack of infectious agents. Anemia is a major health problem but can be addressed through increased awareness and

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adherence to healthy eating practices [6]. The increased risk of developing IDA during pregnancy and lactation has prompted most ministries and governmental and non-governmental bodies in many countries to implement policies to provide iron supplementation for pregnant and lactating women [3].

Good knowledge and eating iron-rich foods when preparing food at home by women to prevent iron deficiency varies depending on the culture and awareness of women. While lower maternal education is associated with a higher incidence of low-birth weight, neonatal death in infants, and prematurity of women with severe iron deficiency [7].

Maintaining a woman's health through healthy behavior represented by eating healthy foods is among the most important protective factors in achieving optimal health [3].

## Objective

**1.** To assess the pregnant woman's knowledge towards Iron deficiency anemia.

**2.** To assess the woman's practices concerning Iron pregnancy anemia.

**3.** To found out relationship between the participants knowledge and practices with their socio-demographic data.

## Methodology

Quantitative design (A descriptive study) was applied in the study during the period 3rd November 2019 at 30th January 2020. A simple random sample is used to select (6) out of 16 primary health care centers PHCs at Al-Amara city. Convenient purposive sampling technique was adopted for (380) pregnant women visiting antenatal care units for preventive or therapeutic reasons, these women were collected from the six centers which include (63) women from Shaheed Al-Watan, (64) from AL-Askan, (63) pregnant women from Al-Quds, (62) Nahawnd center, (64) and (64) from Al-Aruba and AL-Ermuk PHCs respectively. The participants were selected according to predetermined criteria including which include pregnant women and more than one gravida. While the excluded criteria which include female non pregnant and non married. The interview technique was used to collect sample data through the use of constructive questionnaires by researchers to achieve the goals of this study through the use of the Arabic version, which contains three parts: The first part related to socio-demographic information which comprised of (6) items, and the second part to assess of knowledge for pregnant women toward Iron anemia it consists of (34) items. It comprises of (6) section which including (General information about IDA, the causes, symptoms of this type of anemia, the negative effects, the benefit of intake iron pills during pregnancy, and knowledge of pregnant women about food that contains a high concentration for iron. Finally, the section three it concerned with women's behaviors (practices) during the current pregnancy which contains (15) items related to IDA. The content validity of the tool was established by (8) experts. These items were rated according to the three likert scale: (Knowledge and practices) I know / or Always (3); Uncertain / or Sometime (2), and I do not known / or Never scored as (1). The measurement was scored by using cut-of-point intervals (1.00 - 1.66) low; moderate (1.67 – 2.33), and (2.34 – 3.00) high, as well as (L), (M), and (H) respectively. Data were analyzed using Statistical Package of social sciences (SPSS) version 20. Then the results were calculated using descriptive statistics such as percentage, frequency, and Mean of Score, standard deviation, and inferential statistics through ANOVA test to find out correlation between knowledge of the pregnant women and practices regarding IDA. The results were affirmed as significant at $P \leq 0.05$ and not significant at $P > 0.05$.

## Results

**T**here is a quarter of the participants 97(25.5%) of study sample within the age group (20 – 24 years), while 119(31.3%) of pregnant women had their first pregnancy. Concerning to the level of educational is showed half of pregnant women 191(50.3%) in the study sample were primary school graduate. Regarding the subject of occupational status represented the majority of pregnant were 216(56.8%) housewives. In relation to the monthly income the majority were 273(71.8%) have less than (< 700000 Iraqi Dinar). However sources of information concerning iron deficiency anemia the majority of pregnant women were 215(56.6%), they receive their information from health center / mother & child care.

**Table (1): Assessment of Participant Level toward the Knowledge and Practices Concerning IDA**

| Participants' Level | Knowledge. | | Practices | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| Low | 73 | 19.2 | 54 | 14.2 |
| Moderate | 289 | 76.1 | 287 | 75.5 |
| High | 18 | 4.7 | 39 | 10.3 |
| Total | 380 | 100.0 | 380 | 100.0 |
| $\bar{x} \mp S.D$ | $1.77 \mp 0.276 \mp 0.276$ | | $1.95 \mp 0.278 \mp 0.278$ | |

**$\bar{x} \mp S.D.\bar{x} \mp S.D.$=Arithmetic Mean ($\bar{x}$)$\bar{x}$) and Std. Dev. (S.D.), Participant Levels: (1.00 - 1.66) = Low ;( 1.67 – 2.33) = Moderate; (2.34 – 3.00) = High.**

This table reveals that the majority of women have a moderate level of knowledge and practices related to iron anemia (n=380; 289(76.1%), 287 (75.5%)) respectively.

**Table (2): Assessment of Main Domains Related to Pregnant Women's Knowledge**

| No. | Overall Main Domains | N | M. S. | S. D. | Ass. |
|---|---|---|---|---|---|
| 1 | What do you know about iron deficiency anemia? | 380 | 1.58 | 0.413 | **L** |
| 2 | The causes of IDA. | 380 | 1.61 | 0.367 | **L** |
| 3 | The symptoms of anemia for Iron. | 380 | 1.69 | 0.322 | **M** |
| 4 | The negative effects of IDA. | 380 | 1.73 | 0.438 | **M** |
| 5 | The benefit of intake iron pills during pregnancy | 380 | 1.69 | 0.322 | **M** |
| 6 | Food that contains a high concentration of iron. | 380 | 1.91 | 0.339 | **M** |

**n= sample size, S.D= Standard Deviation, M.S= Mean of Score, Ass.= Assessment, Assessment Levels: (1.00 - 1.66) Low; Moderate =( 1.67 – 2.33), and (2.34 – 3.00) = High.**

The results of the above table show the major domains related to pregnant knowledge regarding iron deficiency anemia have mean of score were moderate level, based on the answers of pregnant women, except domains (1&2) demonstrated mean of score were low level.

**Table (3): Assessment of Women's Practices Concerning IDA**

| No. | Items of Women's behaviors during the current pregnancy | Always | | Sometime | | Never | | M. S. | S. D. | Ass. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | % | F | % | F | % | | | |
| 1 | You drink tea with meals | 55 | 14.5 | 289 | 76.0 | 36 | 9.5 | 2.05 | 0.487 | M |
| 2 | You take iron pills daily | 115 | 30.3 | 265 | 69.7 | — | — | 2.30 | 0.460 | M |
| 3 | You take iron pills with orange juice | 52 | 13.7 | 212 | 55.8 | 116 | 30.5 | 1.83 | 0.644 | M |

***Cont...*** **Table (3): Assessment of Women's Practices Concerning IDA**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | You take iron pills with milk or with its derivatives | 65 | 17.1 | 168 | 44.2 | 147 | 38.7 | 1.78 | 0.716 | M |
| 5 | You eat breakfast daily | 16 | 4.2 | 289 | 76.1 | 75 | 19.7 | 1.84 | 0.465 | M |
| 6 | You eat lunch daily | 113 | 29.7 | 243 | 63.9 | 24 | 6.3 | 2.23 | 0.554 | M |
| 7 | You eat dinner every day | 108 | 28.4 | 169 | 44.5 | 103 | 27.1 | 2.01 | 0.746 | M |
| 8 | You take iron pills before eating | 27 | 7.1 | 167 | 43.9 | 186 | 48.9 | 1.58 | 0.622 | L |
| 9 | You take iron pills after eating | 18 | 4.7 | 160 | 42.1 | 202 | 53.2 | 1.52 | 0.588 | L |
| 10 | You eat fruits about half an hour before meals | 34 | 8.9 | 214 | 56.3 | 132 | 34.7 | 1.74 | 0.609 | M |
| 11 | You eat fish | 24 | 6.3 | 215 | 56.6 | 141 | 37.1 | 1.69 | 0.583 | M |
| 12 | You eat eggs daily | 152 | 40.0 | 217 | 57.1 | 11 | 2.9 | 2.37 | 0.540 | H |
| 13 | You eat red meat | 70 | 18.4 | 159 | 41.8 | 151 | 39.7 | 1.79 | 0.733 | M |
| 14 | You eat chicken | 156 | 41.1 | 167 | 43.9 | 57 | 15.0 | 2.26 | 0.703 | M |
| 15 | You eat legumes (chickpeas, lentils, and beans) | 103 | 27.1 | 268 | 70.5 | 9 | 2.4 | 2.25 | 0.484 | M |

Table (3) shows that all items related to practices of iron deficiency anemia have mean of score were moderate level, depending on the responses of pregnant women, except items (8&9) presented low level.

**Table (4): Association between Knowledge of the pregnant women with Their Demographic Characteristics**

| **Knowledge Variables** | **Sources of Variance.** | **Sum of Squares** | **df.** | **Mean Square** | **F.** | **Sig.** |
|---|---|---|---|---|---|---|
| Age (years) | Between Groups | 26.395 | 4 | 6.599 | 43.684 | 0.000 |
| | Within Groups | 56.645 | 375 | 0.151 | | |
| Number of Pregnancies (multipara) | Between Groups | 48.537 | 7 | 6.934 | 74.758 | 0.000 |
| | Within Groups | 34.503 | 372 | 0.093 | | |
| Level of Education | Between Groups | 32.512 | 4 | 8.128 | 60.323 | 0.000 |
| | Within Groups | 50.528 | 375 | 0.135 | | |
| Occupational Status | Between Groups | 19.796 | 2 | 9.898 | 59.005 | 0.000 |
| | Within Groups | 63.243 | 377 | 0.168 | | |
| Monthly Income | Between Groups | 2.036 | 2 | 1.018 | 4.738 | 0.009 |
| | Within Groups | 81.003 | 377 | 0.215 | | |
| Sources of Information Concerning IDA | Between Groups | 36.006 | 3 | 12.002 | 95.946 | 0.000 |
| | Within Groups | 47.034 | 376 | 0.125 | | |
| | Total | 83.039 | 379 | | | |

Findings of the table -4- show that there is a very significant relationship between the knowledge of a pregnant woman about IDA with their demographic characteristics at (p value < 0.05).

**Table (5): Association Between the pregnancy Practices with Their Demographic Characteristics**

| Practice Variables | Sources of Variance | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Age (years) | Between Groups | 18.962 | 4 | 4.741 | 24.204 | 0.000 |
| | Within Groups | 73.446 | 375 | 0.196 | | |
| Number of Pregnancies (multipara) | Between Groups | 28.376 | 7 | 4.054 | 23.551 | 0.000 |
| | Within Groups | 64.032 | 372 | 0.172 | | |
| Level of Education | Between Groups | 36.869 | 4 | 9.217 | 62.234 | 0.000 |
| | Within Groups | 55.539 | 375 | 0.148 | | |
| Occupational Status | Between Groups | 20.446 | 2 | 10.223 | 53.557 | 0.000 |
| | Within Groups | 71.962 | 377 | 0.191 | | |
| Monthly Income | Between Groups | 15.983 | 2 | 7.991 | 39.421 | 0.000 |
| | Within Groups | 76.425 | 377 | 0.203 | | |
| Sources of Information | Between Groups | 32.598 | 3 | 10.866 | 68.312 | 0.000 |
| | Within Groups | 59.809 | 376 | 0.159 | | |
| | Total | 92.408 | 379 | | | |

Data analysis in this table indicates a high correlation between the practices of women towards iron anemia and its demographic data at (p value= 0.00).

## Discussion

Our study is one of the few investigations that aim to collect special data related to the knowledge, and practices of pregnancy towards IDA in the city of Al-Amara / in southern of Iraq. Based on the results, the researchers concluded that the majority of pregnant mothers who visit pregnant care units have moderate or weak knowledge and behaviors in preventing iron deficiency anemia. Reports indicate that iron deficiency is the main cause of anemia that some pregnant women still suffer, and it is the most common nutritional disorder in many countries [(8)]. This reason may be the result of a high prevalence of anemia in developing countries, including the low socioeconomic situation that causes a lack of awareness of a diet containing high amounts of iron. AlAbedi et., al [(9)], who mentioned in their study that aimed To assess women's knowledge about pregnancy risks, the majority of participants does not have enough monthly income which is due to the poor financial situation in the country or most of the women are housewives with a low educational level.

As for women's knowledge and practices about causes and symptoms, negative effects of anemia and methods of prevention by taking iron pills or iron food supplement during pregnancy, it appears at a low to moderate level in our study. This result may be due to a low level of education because the majority have primary schools or because of a lack of experience resulting from the fact that most of them are in the first or second pregnancy. This result was supported by Ghimire and Pandey [(1)], who showed that more than half of the sample (51.3%) and (66.0%) had inadequate knowledge and poor practice in prevention of IDA. Also, AlAbedi et., al (2019) [9] who found in study which conducted in Iraq the majority of participants (35.3%) and (42.0%) have low and moderate knowledge respectively on risk factors during pregnancy, including iron-containing nutrients.

Practices and knowledge of the women for IDA has high significant relationship with increase of age, educational qualification, No. of pregnancies, employment, income status and sources of information at (p value > 0.01). This result was agree with a study conducted in India/Pune by Sivapriya and Parida (2015) [10] Who found that there is a great relationship between information and practices of participants about IDA with socio-demographic data for study participants.

## Conclusion

The results of our study concluded that pregnant women need to improve their knowledge, which in turn enhances their practices. Therefore, the bad and moderate practice towards the prevention of iron anemia is one of the main factors that contribute to an increased incidence of iron deficiency anemia in Al-Amara City.

## Recommendation

Based on the results of the study, primary health care nurses play a vital role by providing health education to women in pregnant care units that focuses on increasing their knowledge of the causes and symptoms of anemia and preventing it by taking iron supplements and eating iron-rich foods during pregnancy. Hence, the researcher emphasizes the need for more research to improve the knowledge and practices of mothers on anemia during pregnancy.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Community Health Nursing and all experiments were carried out in accordance with approved guidelines.

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# Epidemiology of Burn Cases in Erbil Governorate

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## Abstract

**Background and Objectives:** Management and prevention of burns are done through epidemiological study. The mortality rate of burn injuries is seven times higher in the low income countries than the high income countries. The aim of this research was to study the epidemiology of burn injury cases through analysis of the cause, magnitude and profile of burn in Erbil governorate as a method for planning preventive and management strategies.

**Method**: A retrospective study was conducted on 593 burn cases to assess the epidemiology of burn injury cases in Erbil Governorate the capital of Iraqi Kurdistan Region from 2012 to the end of 2016. Descriptive and inferential statistics were used through the Microsoft Excel Database and the Statistical Package for Social Sciences (SPSS, Version 24). The P value of $> 0.05$ was considered as non-statistically significant. The P value of $\leq 0.05$ was considered as statistically significant. The P value of $\leq 0.01$ was considered as highly statistically significant.

**Results:** The total number of burn cases in Erbil governorate during the period 2012 to 2016 was 593 victims. The mean (±SD) age of the studied cases was 26 ± 10.9 years ranging from one to 82 years. The highest number 189 (31.9%) of registered burn cases was in 2013, while the lowest number 74 (12.5%) of cases was in 2015. The female to male ratio of the burn victims was 2.1:1. More than half (56.7%) of them were married, while the others (43.3%) were single. Husband and polygamy were the highest leading causes of the burn cases in a way that each of the causes had formed 18.4% of the cases. The highest number (44.35%) of the burn cases was among the age group 21 to 30 years. There was a significant correlation between the marital status of the studied cases with the causes behind the burn injuries at $p = 0.027$ and highly significant correlation of the marital status with the survival rates in. The correlation was highly significant between the gender of the studied samples and the cause of the burns. There was no significant correlation between the educational levels of the burn victims with the causes and the survival rates as well.

***Key words:*** *immortal, inflicted, burn, injury, Erbil.*

## Introduction

Study of the cause and the history of burn in any population can be done through an epidemiological research which is considered as the first step of management and prevention of burns [10]. The socioeconomic stability of any country is an influential factor for burn profiles [12] . About 11 million people were burnt severely in 2014 worldwide. All these cases required medical care. As a public health problem, annually burns lead to about 180000 deaths. Most of cases occur in the middle and low income countries including South East Asian and African regions. Burn death rates are decreasing in the high-income countries. This rate in the middle and low income countries is seven times higher than the higher income countries. Furthermore, the non-fatal burning injuries are considered as a leading cause for morbidity which includes disfigurement and disability which may result in stigma with rejection and prolonged hospitalization. Although burns are

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preventable but mainly it occurs at the workplaces and homes (WHO, 2017). Burns treatment had improved from the primarily topical therapy including the strange and wonderful topical mixtures, concoctions consisting of cow dung, bees wax, ram's horn and barley porridge with resin-socked dressing of the tree shrub acacia with red ochre, and copper in ancient times to the role of joint scientific fields of topical therapy, antibiotics, fluid resuscitation, skin excision and grafting, respiratory and metabolic care and nutrition. The majority of the advances in burn management had occurred in the last 50 years, spurred on by wars and great fires [1]. The use of systemic antibiotics and topical silver therapy greatly reduced sepsis related mortality. These scientific changes jointly with the advent of antiseptic surgical techniques, burn depth classification and skin grafting allowed the excision and coverage of full-thickness burns which resulted in greatly improved survival rates. Advances in the methods of assessing the surface area of burns helped for more accurate fluid resuscitation, minimizing the effects of shock and avoiding fluid over-loading. The metabolic care, nutritional support and care of inhalational injuries further improved the outcome of burn patients [13].

## Subjects and Methods

A retrospective study was conducted on 593 burn cases to assess the epidemiology of burn injury cases in Erbil Governorate the capital of Iraqi Kurdistan Region from 2012 to the end of 2016. The inclusion criteria for the study sample were the burn cases that had been attended to the law department of the hospitals and police stations. Descriptive and inferential statistics were used through the Microsoft Excel Database jointly with the Statistical Package for Social Sciences (SPSS, Version 24). The P value of > 0.05 was considered as non-statistically significant. The P value of ≤ 0.05 was considered as statistically significant. The P value of ≤ 0.01 was considered as highly statistically significant.

## Results

The total number of burn cases in Erbil governorate during the period 2012 to 2016 was 593 victims. The mean (±SD) age of the studied cases was 26 ± 10.9 years ranging from one to 82 years.

Table 1 show that the highest number 189 (31.9%) of registered burn cases was in 2013, while the lowest number 74 (12.5%) of cases was in 2015.

**Table 1: Number of burn cases per year**

| Year | F | % |
|---|---|---|
| 2012 | 155 | 26.1 |
| 2013 | 189 | 31.9 |
| 2014 | 97 | 16.4 |
| 2015 | 74 | 12.5 |
| 2016 | 78 | 13.2 |
| Total | 593 | 100 |

Table 2 shows the socio-demographic characteristics of the studied burn cases. About two thirds (67.8%) of them were females and about one third (32.2%) of them were males. The female to male ratio of the burn victims was 2.1:1. More than half (56.7%) of them were married, while the others (43.3%) were single. The highest percentage (54.5%) of the victims were primary school graduates. The illiterates, intermediate school graduates and high school graduates had formed 19.9%, 23.8%, and 1.8% of the studied cases respectively.

**Table 2: The socio-demographic characteristics of the sample**

| Characteristics of the sample | Frequency (F) | Percentage (%) |
|---|---|---|
| Gender | | |
| Male | 191 | 32.2 |
| Female | 402 | 67.8 |
| Marital status | | |

***Cont...*** **Table 2: The socio-demographic characteristics of the sample**

| | | |
|---|---|---|
| Married | 336 | 56.7 |
| Single | 257 | 43.3 |
| Education | | |
| Illiterate | 118 | 19.9 |
| Primary school | 323 | 54.5 |
| Intermediate school | 141 | 23.8 |
| High school | 11 | 1.8 |
| Total | 593 | 100 |

Table 3 reveals the overall causes of the burn cases during the year 2012 to 2016. Husband and polygamy were the highest leading causes of the burn cases in a way that each of the causes had formed 18.4% of the cases. Interference of parents in law had formed only 1.2% of the leading causes of burn cases.

**Table 3: Causes of burn cases**

| **Cause** | **Frequency** | **%** |
|---|---|---|
| Husband | 109 | 18.4 |
| Forced marriage | 62 | 10.5 |
| Psychiatric disease | 82 | 13.8 |
| Bad hospital treatment | 59 | 9.9 |
| Premature marriage | 83 | 14 |
| Interference of parents in law | 7 | 1.2 |
| Polygamy | 109 | 18.4 |
| Unknown | 25 | 4.2 |
| Accident | 57 | 9.6 |
| Total | 593 | 100 |

Table 4 reveals that the highest number (44.35%) of the burn cases was among the age group 21 to 30 years and the lowest number of cases (1.01%) was among victims with > 60 years of age.

**Table 4: Distribution of the burn cases by their age**

| **Age / years** | **F** | **%** |
|---|---|---|
| 1 - 10 | 14 | 2.36 |
| 11 - 20 | 175 | 29.51 |
| 21 - 30 | 263 | 44.35 |
| 31 - 40 | 85 | 14.33 |
| 41 - 50 | 36 | 6.07 |
| 51 - 60 | 14 | 2.36 |
| > 60 | 6 | 1.01 |
| Total | 593 | 100 |

Table 5 indicates the burn size percentages of the studied sample. Unfortunately, the highest number (21.92) of the burn cases had suffered from 96% to 100% of burn size and the lowest number (1.01) of cases suffered from 31% - 35% of burn size.

**Table 5: The burn sizes by percentage**

| Burn size % | F | % |
|---|---|---|
| 5 - 10 | 32 | 5.40 |
| 11 - 15 | 53 | 8.94 |
| 16 - 20 | 47 | 7.93 |
| 21 - 25 | 49 | 8.26 |
| 26 - 30 | 53 | 8.94 |
| 31 - 35 | 6 | 1.01 |
| 36 - 40 | 8 | 1.35 |
| 41 – 45 | 15 | 2.53 |
| 46 – 50 | 7 | 1.18 |
| 51 – 55 | 7 | 1.18 |
| 56 – 60 | 41 | 6.91 |
| 61 – 65 | 10 | 1.69 |
| 66 – 70 | 37 | 6.24 |
| 71 – 75 | 9 | 1.52 |
| 76 - 80 | 30 | 5.06 |
| 81 – 85 | 16 | 2.70 |
| 86 – 90 | 44 | 7.42 |
| 91 – 95 | 13 | 2.19 |
| 96 - 100 | 130 | 21.92 |
| Total | 593 | 100 |

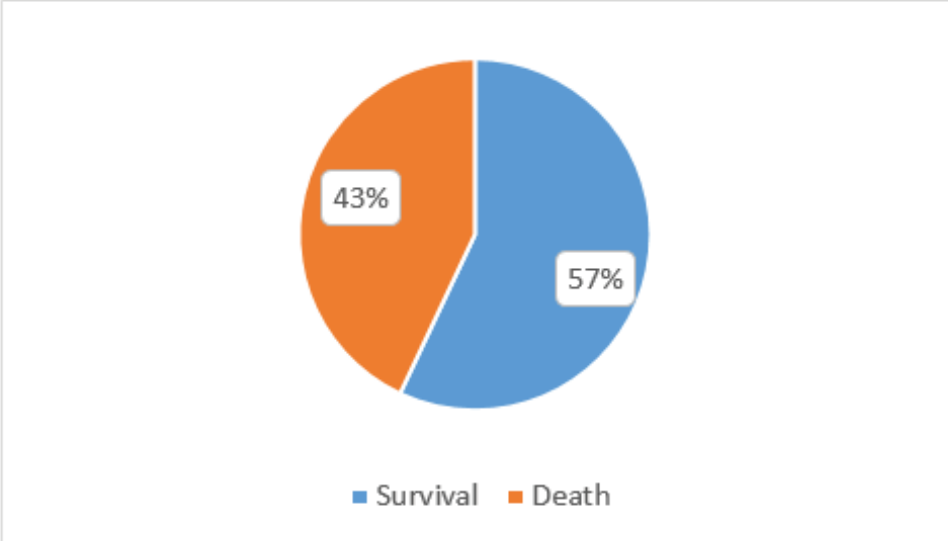


**Figure 1. Proportion of survival and death of the burn injury cases**

Figure 1 shows the proportion of survival and death of the burn injury cases.

The correlational statistical findings of this study had been calculated. There was a significant correlation between the marital status of the studied cases with the causes behind the burn injuries at p = 0.027 in one hand and highly significant correlation with the survival rates in another hand. The correlation was highly significant between the gender of the studied samples and the cause of the burns. There was no significant correlation between the educational levels of the burn victims with the causes and the survival rates as well.

## Discussion

This study has analyzed the burn profiles in Erbil City from 2012 to 2016. The gradual decrease of recorded annual burn cases can be attributed to the shifting from kerosene use to other resources such as electrical heating systems in the study region. In a study by [10] in Delhi, it has been concluded that economic uplift and shift from kerosene to safer LPG stoves has decreased the annual burn admission by 43% in a major burn unit of Delhi. The survival rate among all the burn cases during the 5 years was 46% and the death rate was 56%. An Indian study by [9] has reported 54.51% of death among the burn injury cases. They concidered the high mortality rate amongst burn patients as a major concern of health care towards burn injuries. The ratio of female to male among the currently studied cases was 2.1. Previous studies indicated that immolation and self burning is more common among young females than males in the Eastern Mediterranean region and South and Central Asia including Kurdistan Region. This phenomenon can be contributed to the social and psychological distresses arising from the male dominated society. Marriage is one of the common sources of conflict between genders and generations [9]. Another study in Iran by [1] indicated the higher number of self-immolation victims among females than males. The current study revealed that burn cases had been occurred mostly among primary school graduates. This result came in coincide with that of Ahmadi et al., 2014 [1] among the northern people of Iran which showed higher incidence of the self immollation among primary school graduates. In regard to the causes behind the self-immolation, it has beeen found that the social and psychiatric causes had formed the higher proportions than the bad hospital treatment and the accidental burn cases. Suicidal self-immolation is a terrible common method in Eastern societies. One study explored the leading causes to self-immolation in young Kurdish females. The latter study ralated the self-immolation attemts to absence of self-control over the personal life, family conflicts, to self-immolation attempts, including not having control over personal life, marital conflicts, looking for attention, seeking attention, feeling of guilt, and male domination among such communities [8]. Another study in Musil Teaching Hospital revealed that the self-inflicted burn cases had a significantly larger percentage of surface body area and this type of burning was the most common cause of hospital admissions among the burn cases which lead to the higher mortality in this patient group [7]. In a study on the syrian society, lower self-esteem, less life satisfaction, less marital satisfaction and more mental health symptomatology than monogamous marriages had been recorded. Many of the mental health symptoms were arised such as somatization, depression, hostility and psychoticism. Moreover, the latter wives reported less psychosocial problems than the second and first wives [6]. Premature marriage was one of the leading causes to self-immolation among the studied population of the current study. In many countries of the world, premature marriage before the age of 18 is a reality. This type of marriage is permitted according to the Universal Declaration of Human Rights for many young women who are encouraged by their families while they are still children aiming to get the financial and social benefits, although child marriage is considered as violation of human rights. Probably this will lead to early pregnancy and social isolation. Furthermore, it will lead to decrease the education ooportunity and poor training that will cause the gendered nature of poverty. The self-inflicted burn cases which had been detected by this study were resulted from the forced and/or the premature marriage that had been associated with the above mentioned socio-cultural and economical factors. Although, nearly one in 10 burn cases of the present study had been recorded as result of the bad hospital treatment, but it has not been medically supported. In a study from Iran, the risk factors for death of the burned patient had been attributed to the age of the patients, the gender, and the size of the burn. Directing more attention to the vulnerable patients had been required to reduce the mortality rate and improvement of the patient survival [11].

In regrd to the age of the most vulnerable age groups to burn injuries, the highest proportion of the

victims were within the young age group of 21-30 years. This situation differs from one to another country or culture. In our study, the mean age ± SD was 26 ± 10.9. According to a study in the United States of America the self-inflicted burn cases formed only 1% of the injury cases during 2011-2015. In Tabriz, Iran, among the 412 self-inflicted burns, the average age was 25.5 years and the majority (99%) of the cases were female. About two thirds (76.5%) were in the age groups of 15–19 and 20–29 years (Maghsoudi et al., 2004). In Tehran, Iran from 1997 to 1999, and among the 110 self-immolation patients, the mean age was 25 years.

## Conclusion

This study revealed that number of burn cases had been decreased from 2012 to 2016. Females burn cases was higher than males by two folds. More than half of the cases was among the primary school graduates. Spouse, polygamy, premature marriage and psychological diseases were the top risk factors of self-inflicted burns. The highest percentage of burn cases was associated with the larger sizes of the burn injuries. Legal, social, and educational efforts are needed to decrease the accidental and self-immortal burns among the community members.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Nursing and all experiments were carried out in accordance with approved guidelines.

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# Changes of Some Environmental Factors in the Iraqi Coastal Waters

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## Abstract

Some environmental factors were studied in the areas near Umm Qasr Port and near Buoy 17 in addition to the Basra oil port area. Where the monthly study was conducted on the changes occurring in the water temperature, pH degree, salinity, conductivity, turbidity, light penetration, total suspended solids, total dissolved materials and alkalinity were studied. The current study showed that the temperature values were within their annual rates as they ranged from 14-34 °C, while the values of the acid function and alkalinity were that within the ranges prevailing characteristic of Iraqi coastal waters, while conductivity recorded low values during January in all study stations, also recorded low values of transparency for the first and second stations (14-40 cm) compared to the third station that recorded higher values as 200-250 cm, while the turbidity values in the third station decreased and high values were recorded in the first and second stations and this is the case in the TSS and TDS values as well.

***Key words:*** *environmental factors, Iraqi coastal waters.*

## Introduction

The marine ecosystem constitutes about two-thirds of the planet's surface. This system includes most of the water bodies on Earth, such as: seas, oceans, estuaries, and the tidal environment, which together represent environments for different types of organisms characterized by a dynamic interaction in which there is a continuous overlap between living and non-living components [1]. The Arabian Gulf forms an important part of the marine waters. It is an arm of the Arabian Sea that extends from the Gulf of Oman in the south to the north of the Shatt al-Arab. The Iraqi coast occupies an area of 64 km and is short when compared to the rest of the coasts of neighboring countries [2]. The Arabian Gulf is located between the º24 و º30 north circles and classified as a semi-closed sea surrounded by land from most of its sides, and has great political, economic and environmental importance [3] and it is considered as one of the busiest waterways with the movement of oil and commercial ships as well as ships carring Natural gas [4]. The importance of studying the coasts is evident throughout the Arab Gulf States, as it has a strategic coastal location and a distinct geo-economic location, including the Iraqi coast, which is characterized by special conditions such as shallow waters that determine its morphological appearance, as well as the problems of the marine confrontation represented by its limited breadth, while some other neighboring coasts extend to Several kilometers, but it does not exceed a few kilometers in the northern and northwest coasts of the Arabian Gulf. This increasing interest in the region comes as a result of its economic status in addition to several geological and biological aspects [5]. The marine ecosystem consists of non-living and living components that are in a state of continuous dynamic interaction, just like the wild ecosystem, and they provide the appropriate atmosphere for living organisms to continue their vital activity. Several studies were conducted in the field of marine chemistry in the Iraqi coast and the Arabian Gulf (Hartman et al. [6]; Brewer and Dyressen [7]; Kany, [8]; Al-Shawi, [9]; Al-Mahmood et al. [10] and Al-Imarah et al. [11].

## Method

The present study samples were collected monthly

from three station for the period from February 2018 to January 2019 at a depth of 10-20 centimeters from below the surface of the water by means of a plastic container. A medium-sized Tugboat was used in the collection process. A set of environmental characteristics were measured in the field.

The first station is located near the Port of Umm Qasr and represents the northern part of the creek and its coordinates N 30° 06′ 47.3″ and E °47 55′ 14.7″, the water depth ranges between 12-15 meters and this station is characterized by frequent movement of commercial ships to and from the port. The edges of this plant are characterized by loose clay, free of plants, and water recedes from large areas during the tidal period. With high water turbidity due to the speed of tidal currents. As for the second station, it is located at the bottom approaches of the Khor Abd Allah near Buoy 17, which is a navigational channel and its coordinates E ″48.9 ′19 °48, N ″26.2 ′53 °29 . This station is characterized by having large tidal areas with high turbidity water due to tidal currents.

Sampling was collected monthly for the period from February 2018 to January 2019. Water samples were taken from under the surface of the water at a depth of 10-20 centimeters by a plastic container and a medium-sized marine tug was used in the collection of samples. A US-made HORIBA U-5030 multimeter was used to measure water temperature, pH, salinity, electrical conductivity, field soluble solids.

Light penetration = (d1+d2)/2 (Stirling, [13])

The total suspended matter was measured by the method described by the American Public Health Association APHA [14]. The turbidity was measured using the TURBIDIMETTE LaMotte2020we type and were expressed in units NTU.

**Figure (1): A map showing the three study stations at the NW Arabian Gulf sampled for the period from February 2018 to December 2019.**

## Results and discussion

### Water Temperature

The water temperature ranged between 14 °C in January in the first and second stations and 34 °C during August in the third station (Figure 2). The first and second stations recorded values ranging between 14-31 °C, the with the highest values were recorded during August, September and October at the first station while it was at the second station during August and September, where as at station three the values ranged between 15 and 34 °C during January and September, respectively. The results of the statistical analysis showed that there were no significant differences ($p>0.05$) between the study stations.

### Hydrogen Ion Concentration (pH)

The pH values ranged between 7.7 and 8.49 in the first station during May and March, and in the second station they ranged between 7.9 during April and May and 8.47 during June, and in the third station they ranged 7.6 and 8.5 during May and February, respectively

(Figure 3). The results of the statistical analysis showed that there were no significant differences (p>0.05) between the study stations.

**Alkalinity**

The values of alkalinity for the first station ranged between 60 and 73 mg/l during July and February, which is the highest range among the three stations. The monthly changes in alkalinity values in the second station ranged from 62 to 71 mg/l during January and August, respectively. The alkalinity values for the third station recorded a ranged between 61 and 72 mg/l during December and September, respectively (Figure 4). The results of the statistical analysis showed that there were no significant differences (p>0.05) between the alkanity values in the study stations.

**Salinity**

The salinity values ranged between 40.3 and 49.3 parts per thousand, in April and June, respectively, in the first station, where as in the second station, their values ranged between 36.2 and 45. 1 parts per thousand in April and February, respectively, and in the third station between 37.5 and 44 parts per thousand in April and February, respectively (Figure 5). The results of the statistical analysis showed that there was a significant difference (p>0.05) between the first station and the second and third stations, while no significant difference was recorded between the second station and the third station.

**Light penetration**

The values of light transmittance showed ranges of convergence at the first and second study stations as their values ranged between 14-25 cm in the first station during April and July, while the second station recorded values that ranged between 25-40 cm during May and October, while the third station recorded high values for light transmittance ranged between 200-250 during July and December, (Figure 6). Statistical analysis indicate a significant difference (p>0.05) between the three study stations.

**Turbidity (NTU)**

The Turbidity values showed different ranges in the three study stations, as their values ranged between 0.64 and 81 NTU. Figure (7) shows the clear fluctuation in these values during time, as the lowest value of 0.64 NTU was recorded in January at the third station, while the second station recorded a low value of 3.7 NTU during August, while the first station recorded the lowest value of 31.6 NTU in September, and the highest in the three stations 75, 81 and 3 NTU during November, December and August respectively. Statistical analysis showed that there was a significant difference between the first and third stations only (p>0.05), and no differences were recorded between the other study stations.

**Total Suspended Solids (TSS)**

The values of the total suspended solids showed different ranges during the study, as their values in the first station ranged between 0.11 and 0.34 mg/liter during October and April, respectively, while they were in the second station between 0.09 and 0.32 mg/liter October and September, consequently, as for the third station, its values ranged between 0.04 and 0.13 mg/liter during August and January, respectively (Figure 9). The statistical analysis showed that there was a significant difference between the first and third stations only (p>0.05) and no significant difference was recorded between the other stations.

**Total Dissolved Solids (TDS)**

The values of total soluble solids were recorded level in all study lowest stations during January with values of 34.2 and 31.3; 25.3 mg/l, in the three stations respectively, as where higher values of 50 mg/l was recorded in the first station during December and 401.2 and 40 mg/l in the second and third during November and February, respectively (Figure 10). The results of the statistical analysis showed that there were no significant differences (p>0.05) between the study stations.

**Electrical Conductivity (ms/cm)**

The lowest level of conductivity values were recorded during January with values ranging from 53.4, 48.9 and 45.7 ms/cm at the first, second and third stations, respectively, the highest values were recorded in june in the first and third stations (77.1 and 66 ms/cm, respectively), While the second station recorded the highest conductivity values during September (67 ms/cm) (Figure 11). The results of the statistical analysis

showed that there were no significant differences ($p>0.05$) between the study stations.

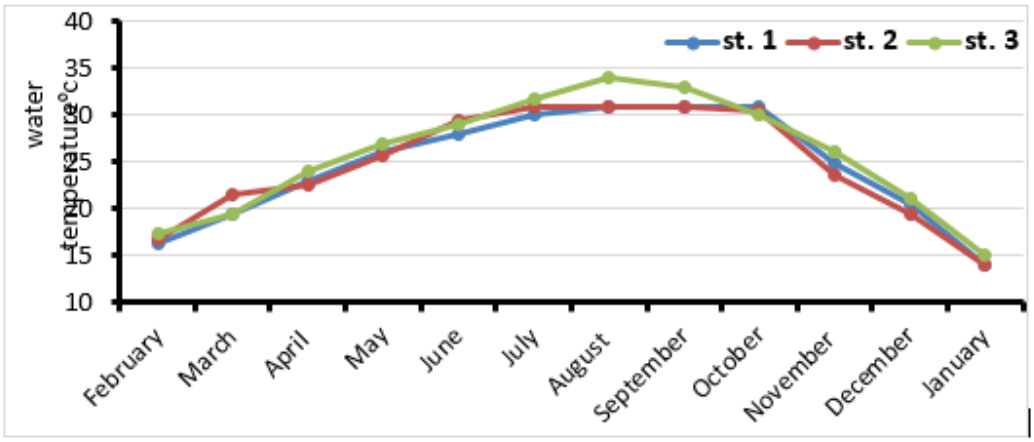


**Figure (2). Monthly variation in the water temperature at the three stations of the NW Arabian Gulf during the period from February 2018 to January 2019.**

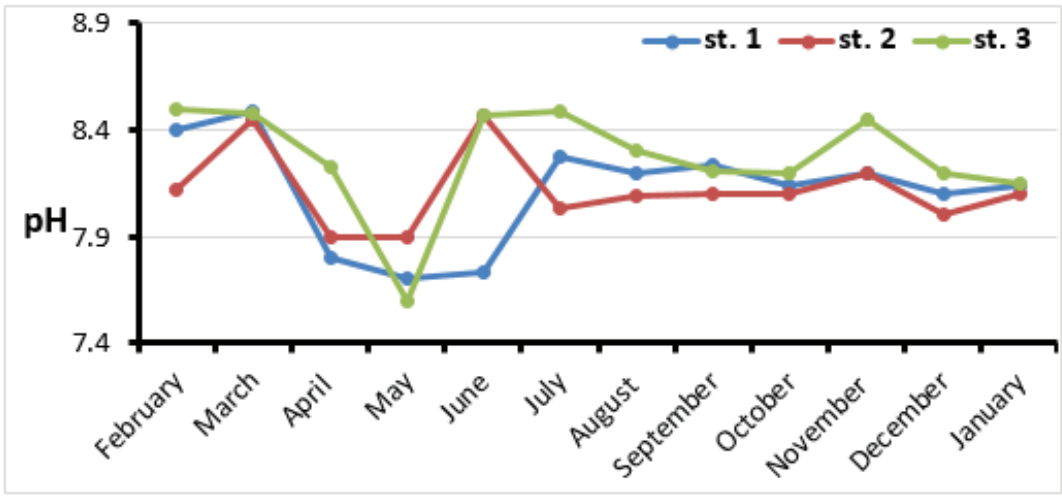


**Figure (3). Monthly variation of pH values at the three stations of the NW Arabian Gulf during the period from February 2018 to January 2019.**

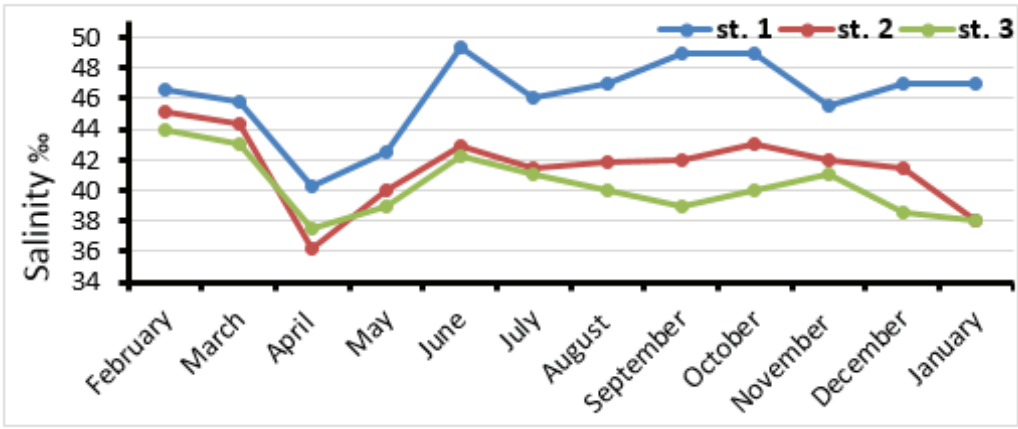


**Figure (4). Monthly variation in the salinity of water at the three stations of the NW Arabian Gulf during the period from February 2018 to January 2019.**

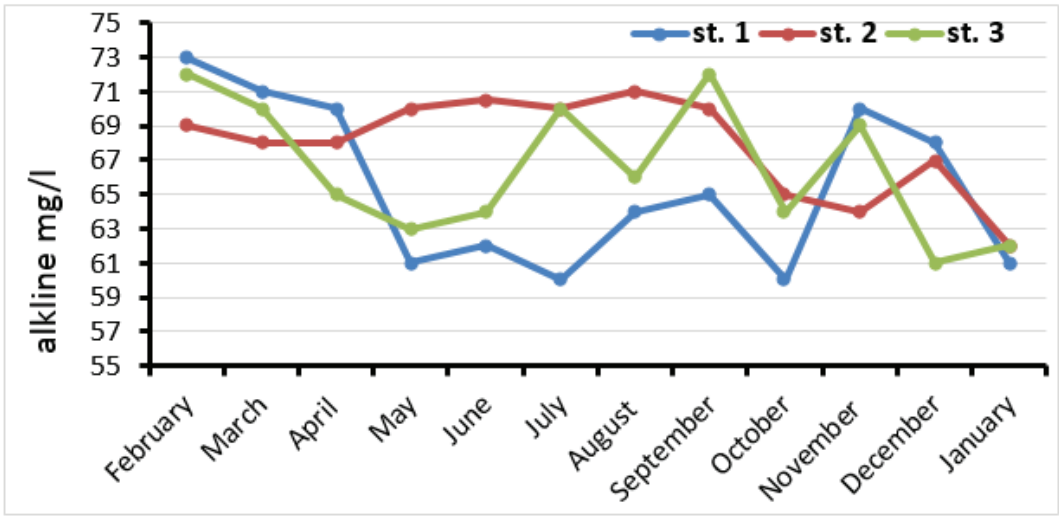


**Figure (5). Monthly variation in the alkalinity at the three stations of the NW Arabian Gulf during the period from February 2018 to January 2019.**

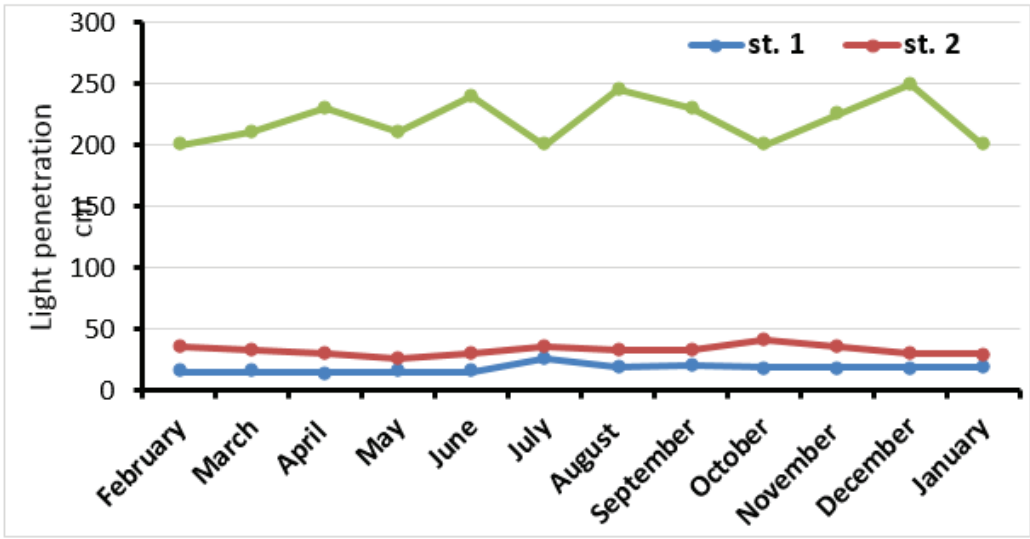


**Figure (6). Monthly variation in light penetration values at the three stations of the NW Arabian Gulf during the period from February 2018 to January 2019.**

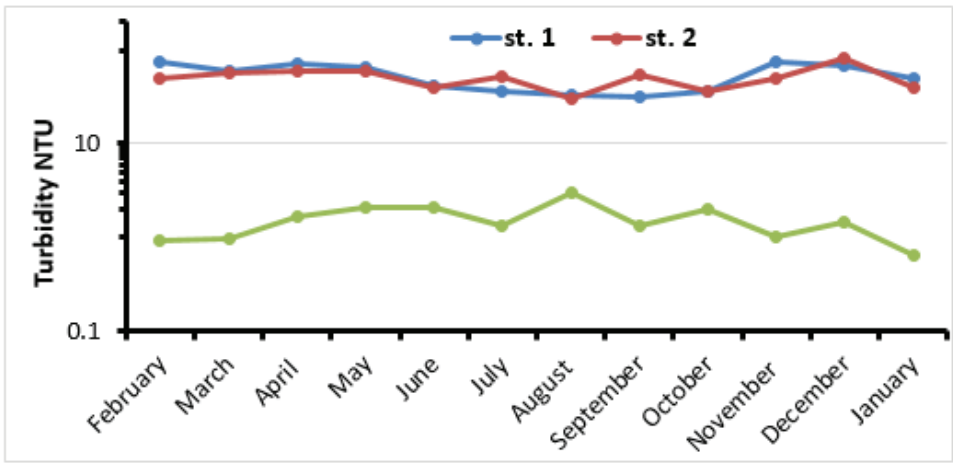


**Figure (7). Monthly variation in the turbidity values at the three stations of the NW Arabian Gulf during the period from February 2018 to January 2019.**

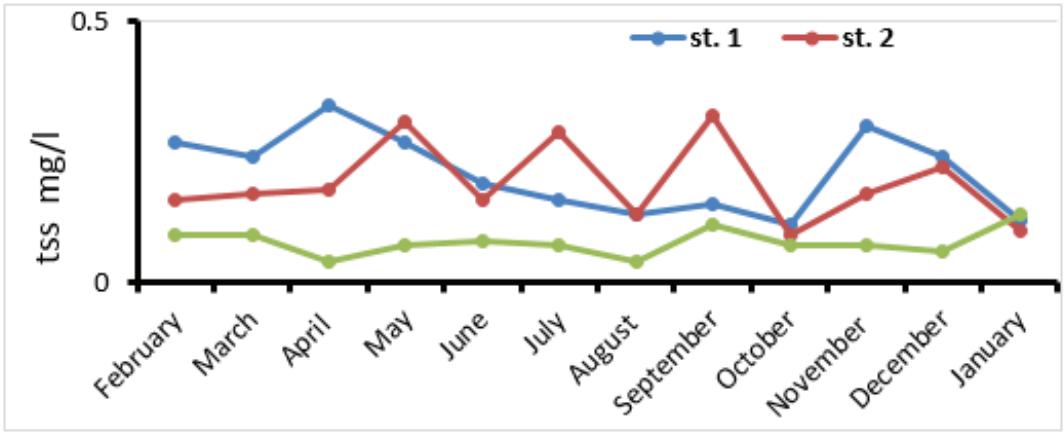


**Figure (8). Monthly variation in the total suspended solids values at the three stations of the NW Arabian Gulf during the period from February 2018 to January 2019.**

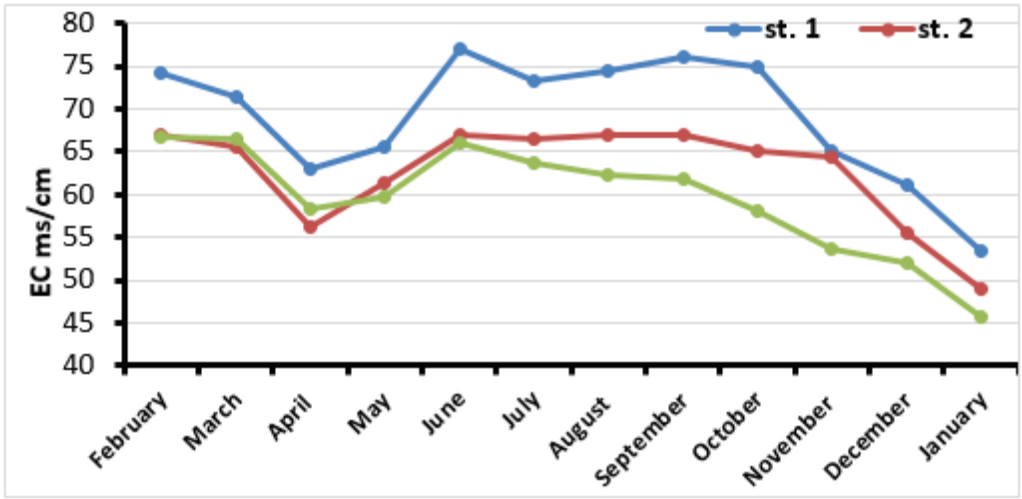


**Figure (10). Monthly variation in the conductivity values at the three stations of the NW Arabian Gulf during the period from February 2018 to January 2019.**

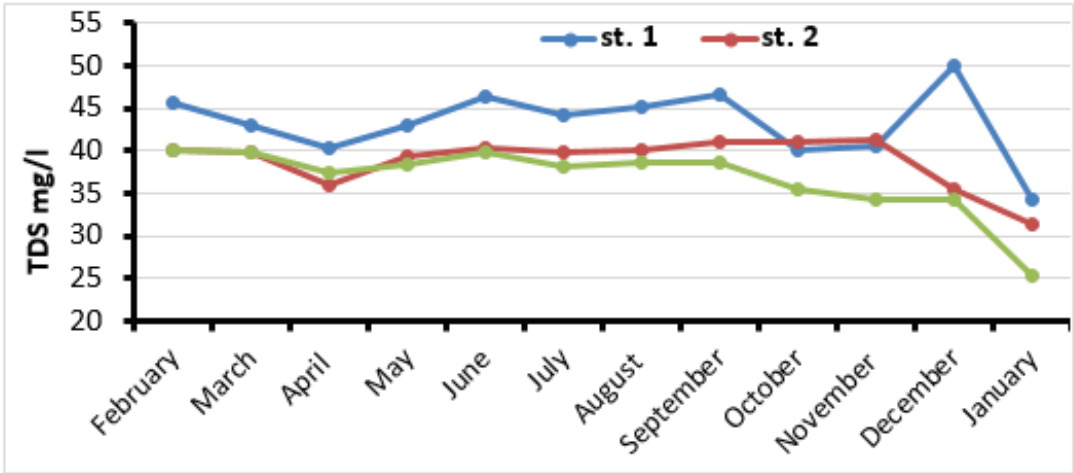


**Figure (10). Monthly variation in the total dissolved solids values at the three stations of the NW Arabian Gulf during the period from February 2018 to January 2019.**

## Statistical Analysis

Using XLSTAT-Premium 2018.1 Multingual software to analyze the values of the environmental factors in the three studied stations. the value of the intrinsic vectors and the cumulative values of the studied values are shown in Figure (11), values and through which Figure (12), was extracted which in turn shows the PCA analysis of the factors of study stations association with the environmental variables studied during year.

The figure showed that in the third station the transparency was a limiting factor and to a lesser extent the pH is the next most influencing factor at this station, while in the first and second stations the rest of the factors as EC, TDS, Sal., Alkalinity, TSS, Turbidity and to a lesser extent WT are of greater influence on the environment of these stations. Also, through the tree drawing that were drawn by the above statistical program (Figure 13), we can see three groups that are most closely related to each other, the first group has included most of the months of the third station, while the second and third group has included most of the time of the second stations.

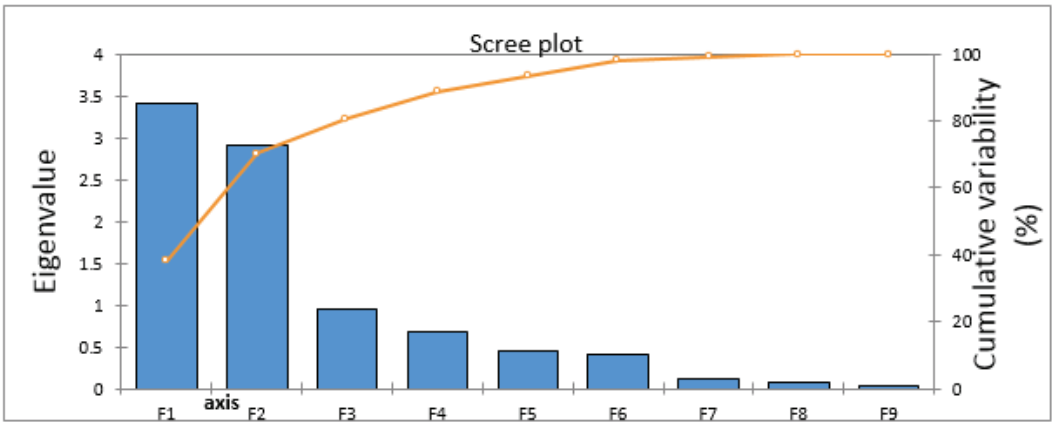


**Figure (11). Values of the vector and the cumulative values of the studied values at the three stations of the NW Arabian Gulf.**

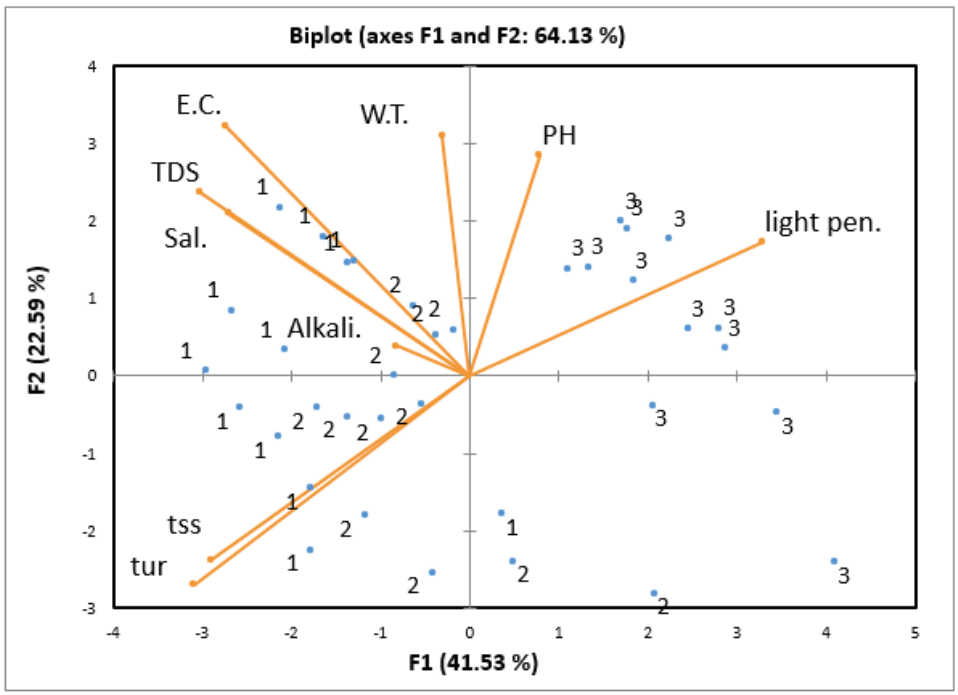


**Figure (12). Analysis (PCA) of the F1 and F2 vectors for the factors of association of the study stations with the environmental variables studied during the months of the year at the NW Arabian Gulf.**

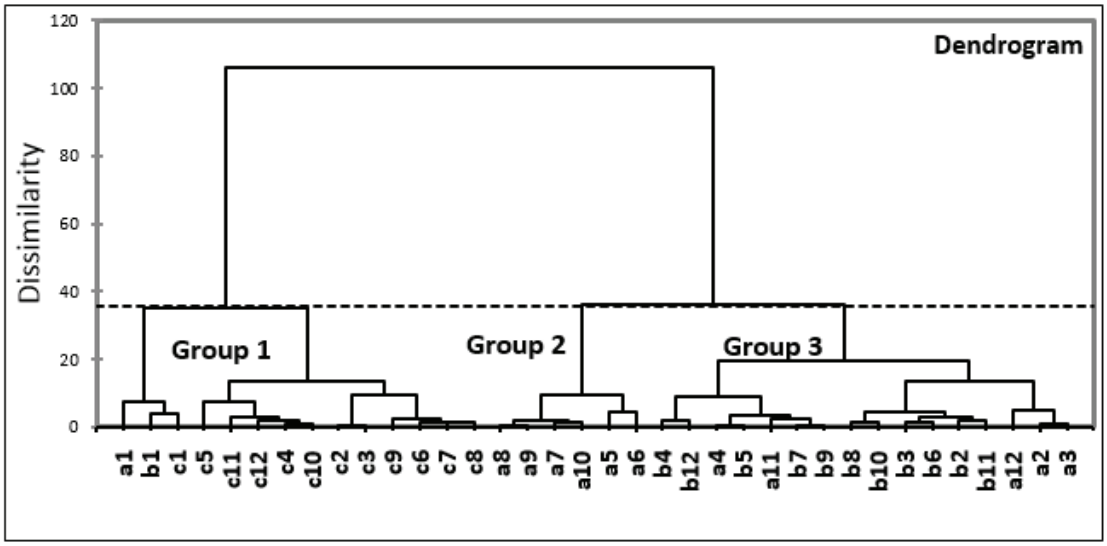


**Figure (13). Tree diagram for similarity and differences between the factors studied at the three stations during the period's February 2018-January 2019 of the year at the NW Arabian Gulf.**

a= first station, b= second station, c= third station. As for the numbers, they represent the months of the year.

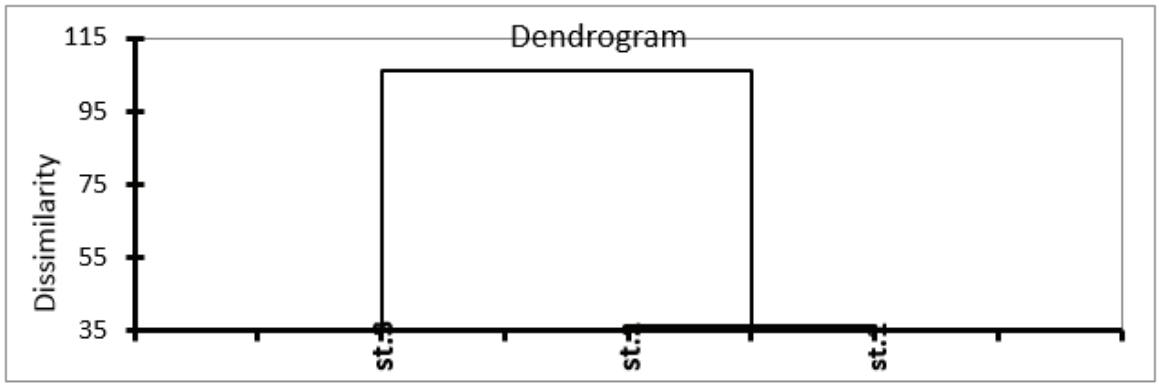


**Figure (14) shows a summary of the tree diagram for similarity and difference between the factors studied for the three stations of the NW Arabian Gulf.**

## Conclusionss

It was found through the current study that the temperature values were equal in all stations because the three stations are subject to the same climatic conditions. Whereas the pH and alkalinity values indicated the basic characteristic of this water. The values of transparency also showed that the third plant is less cloudy than the first and second stations, as the water has a deeper and lower speed for the current, and it is also an open water area. The salinity and conductivity values recorded relatively low values in the third station, while they were higher in the first and second stations, as the last two are subjected to the conditions of higher evaporation, which results in an increase in salinity values, and the TSS and TDS values were carved in the same direction.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Marine Biology Department and all experiments were carried out in accordance with approved guidelines.

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# Primary School Teachers' Attitudes regarding Stuttering of School Age Children at First Al-Karkh Education Directorate in Baghdad City

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## Abstract

**Objective(s)**: To assess primary school teachers' attitudes regarding the stuttering of school-age children at first al-karkh education directorate in Baghdad city, and find out the relationships between primary school teachers' attitudes regarding stuttering and their demographic characteristics

**Methodology:** The study started from the period of 20th September 2018 to the 1st of March 2020. Probability samples of 370 primary school teachers were chosen randomly. The questionnaire was designed and composed of two parts: the first part deals with the teachers' demographic data; the second part includes a stuttering attitude scale. Determined reliability of the questionnaire through a pilot study and determined validity through a panel of (31) experts. The data was collected through the self-administration method was used by asking the participants to complete the format of the questionnaire and fulfill the questions, and it described statistically and analyzed through the use of descriptive and inferential statistical analysis procedures**.**

**Results:** The findings of the present study indicate that (71.3 %) of the study sample has a neutral level of attitudes toward stuttering of school-age children.

**Conclusions:** The study concludes that most of the teachers' attitudes were neutral related to the stuttering of school-age children, and there are no effects of socio-demographic characteristics of teachers' on their knowledge about stuttering.

**Recommendations:** The study recommended an education program about stuttering for primary schools' teachers to improving their attitudes toward children who stutter (CWS) in the school environment, and there are no effect socio-demographic characteristics of teachers' on their attitude toward stuttering.

***Keywords:*** *Primary School Teachers, Attitudes, School Age Children, Stuttering*

## Introduction

Stuttering exists in all cultures and societies throughout the world (Al-Khaledi et al., 2009; Nicholls, 2013; Safwat & Sheikhany, 2014). It is a fluency disorder characterized by involuntary disruptions of the flow of speech, hindering the production of continuous, smooth and effortless speech (Silva et al., 2016), It is a communication disorder that interferes with a person's ability to speak fluently. It involves the repetition, prolongation, or blockage of sounds, syllables, or words (Scott & Guitar, 2010). Stuttering is a speech disorder that affects the fluency of speech, it is speech events that contain monosyllabic, whole-word repetitions, part-word repetitions, audible sound prolongations, or silent fixations or blockages; these may or may not be accompanied by accessory behaviors. Roughly 3 million Americans stutter. Stuttering affects people of all ages. It occurs most often in children between the ages of 2 and 5 years old as they are developing their language skills (Terry, 2015). It has been estimated that about one percent of the general population stutters. This would amount to almost three million stutterers in the

United States alone. Stuttering is about three or four times more common in males than in females (Nicholls, 2013). Stuttering can be classified into neurogenic is derived from brain damage vascular or traumatic origin and development stuttering that defined as the result of a dysfunction of the central nervous system with a genetic basis, which appears in the period of acquisition and development of language, between 18 months and seven years of age (Silva et al., 2016). Developmental stuttering is the most common type of stuttering usually develops of its own accord in childhood, although in rare cases it may begin much later. Approximately 5 percent of all children go through a period of stuttering that lasts six months or more. Three-quarters of those will recover by late childhood, leaving about 1% with a long-term problem (Scott & Guitar, 2010; Hobbs, 2012). The exact causes of stuttering are unknown (Jenkins, 2010). It can result from an interaction of factors including child development, family dynamics, genetics, and neurophysiology (Scott & Guitar, 2010). The evolution of developmental stuttering causes serious consequences in the life of a child, hampering their communication and may cause psychological impacts, generate negative emotions, shyness, fear related to speech and anxiety. Thus, the child is more exposed to errors of judgment and thus to improper attitudes of their teachers before his/her speech difficulty (Silva et al., 2016). For CWS, bullying and other forms of victimization such as teasing can be a problem and are common(Nicholls, 2013), Several studies have investigated the incidence of stuttering-related teasing or bullying, and have found between 44% and 83% of children who stutter (CWS) experience bullying or some other form of victimization from their peers(Nicholls, 2013; Blood et al., 2011). School-age children spend a considerable amount of time at school and there is little doubt that teachers are authority figures who can have a significant influence on their lives during these formative years (Abdalla & St. Louis, 2012; Placencia, 2014; Abrahams, 2015; Abrahams et al., 2016). Thus, educators play an important role in the educational development of CWS, their attitudes can significantly affect the performance of students in the classroom, as well as their progression (Jenkins, 2010; Silva et al., 2016), Many CWS testify that stuttering negatively impacted their self-confidence in school, academic capacity, and relationships with teachers and peers (St. Louis, 2011).

## Materials and Method

**Study Design:** Descriptive cross-sectional study design was conducted on teachers working in governmental primary schools at first Al-Karkh education directorate in Baghdad city, the study started from the period of 20th September 2018 to 1st March 2020 and aims to assess primary school teachers' attitudes toward stuttering of school-age children, and find out the relationships between primary school teachers' attitudes toward stuttering and their demographic characteristics.

**Study Sample:** Probability samples of 370 primary school teachers and currently works in government primary schools were selected from 30 primary schools at first Al-Karkh education directorate in Baghdad City they were chosen randomly from each school.

**The Study Instruments:** To measure the primary school teachers' attitudes toward stuttering, the instrument was designed and constructed by the investigators depending on the Arabic version of adopted and developed Public Opinion Survey of Human Attributes-Stuttering Scale (POSHA-S) (St. Louis, 2011; Abdalla & St. Louis, 2012), the questionnaire format consists of two parts:

**Part I: Teacher's Demographic Characteristics:** This section includes (6) items concerning the respondents' general characteristics: age of teacher, gender, residency, marital status, education level, and their teaching experience years.

**Part II: Stuttering Attitude Scale:** This part of the questionnaire is composed of 40 items concerned with the teacher's attitude toward stuttering, it includes beliefs and reaction sections. The questionnaire used a paper-and-pencil format and asked participants to respond to each statement by answering (Yes), (To some extent) or (No).

**Data collection:** The data collected by the investigators, Participants were asked to complete a self-administered questionnaire, after taking the initial consent of each teacher to participate in the study, the process started from the 20th of February until the 30th of May 2019.

**Rating and Scoring of the Questionnaire Format:** The items have been rated and scored according to the

following patterns: Three-point Likert scales are used for rating the items as yes =3, to some extent =2, no =1, except all negatively worded questions are reversing scored. The total score ranged between (40- 120). The lowest score indicated a negative attitude while the highest score reflects a positive attitude.

**Data Analyses:** This analysis was performed through the computation frequencies, percentages, arithmetic mean, standard deviation (SD), mean of the score (MS) and relative sufficiency(RS%). Contingency Coefficients (C.C.) test was used to the assessment of the relationship between overall attitudes of participants and other variables.

## Results

Most of the study sample were represented (34.1%) within age groups of (40-49) years, (83.8%) were females, the highest percentage (93.2%) of the study sample are living in urban residential area, (71.9%) of the study sample were (Married), (40.3%) were graduates from (Institute/2 year Diploma degree), and (35.9%) have (10-19) years' experience in teaching.

**Assessment by RS%: (33.33 – 55.55) Negative; (55.56 – 77.77) Neutral (77.78– 100) Positive**

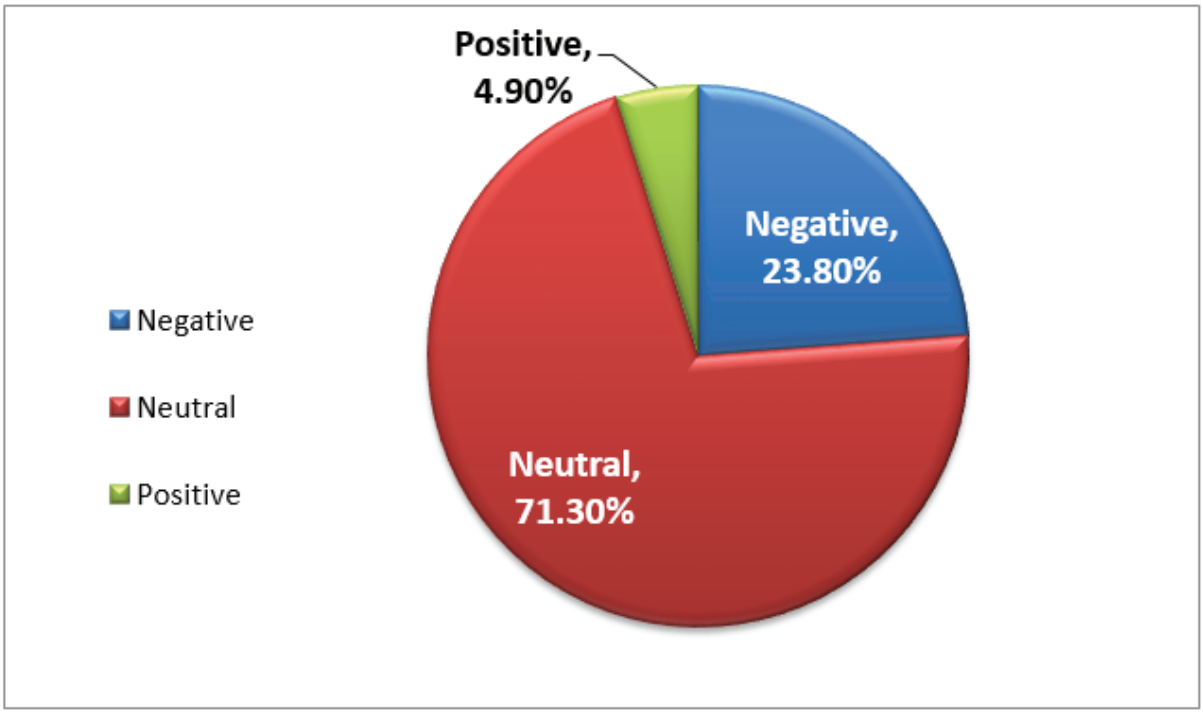


**Figure (1): Distribution of the Teachers' Attitudes toward Levels of Assessment.**

The results in figure (1) indicate that (71.30 %) of the study sample represents neutral level of attitudes, while only (4.90%) have positive attitudes toward CWS.

**Table (1): Association between Attitude of primary school teachers and their socio-demographic characteristics**

| No. | Socio-demographic characteristics | Attitude | | |
|---|---|---|---|---|
| | | C.C. | Sig. | C.S.(*) |
| 1. | Age Groups | 0.097 | 0.476 | NS |
| 2. | Gender | 0.099 | 0.056 | NS |
| 3. | Residence | 0.020 | 0.702 | NS |
| 4. | Marital Status | 0.097 | 0.316 | NS |
| 5. | Education level | 0.103 | 0.414 | NS |
| 6. | Number of teaching experience years | 0.142 | 0.054 | NS |

**(*)HS: Highly significant at P<0.01; S: significant at P<0.05; NS: Non-significant at P>0.05; Testing based on Contingency Coefficients (C.C.).**

This table shows no-significant relationship between socio-demographical characteristics and attitudes of primary school teachers toward stuttering.

## Discussion

The analysis of the (POSHA-S) scale showed that less than three-quarters of the study sample had neutral, and a little less than a quarter had negative attitudes toward CWS in the figure (1). The findings of this study agree with (Parasuram, 2006) who mention that a teachers had a neutral response to disability in general, and agree with (Irani et al., 2012) they mention that majority of Arab teachers reported neutral attitudes toward people who stutter (PWS) and, close to one-third of the Arab teachers reported relatively negative attitudes toward PWS. Also agree with (Abrahams, 2015) who reported that most of his study sample (62%) was in neutral level, and agree with (Abrahams et al., 2016) they mention that overall result indicates neutral attitudes towards stuttering.

## Conclusions

According to the findings of the present study, the researcher concluded that most of the study samples at age group (40 - 49 years), the vast majority of the primary school teachers were female, and, teachers' attitudes were neutral related to stuttering of school-age children. There is no significant association was found between teachers' attitudes toward stuttering and their socio-demographic characteristics.

## Recommendations

Education program about stuttering is essential to improve the teachers' attitudes toward stuttering, and using mass media and television for educating the community as a whole and not teachers only.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Ministry of Health and all experiments were carried out in accordance with approved guidelines.

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# Synthesis and Antibacterial Evaluation of some New Pyrazole Derivatives

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**Abstract**

Ten new chalcones were prepared in three steps, firstly phthalic anhydride reacted with 4- amino acetophenone to produce 2-(4-acetyl phenyl carbamoyl) benzoic acid ($A_1$), secondly [2-(4-acetyl phenyl carbamoyl) benzoic acid ($A_1$)] suffers from the loss of a water molecule via reaction with (anhydrous sodium acetate and acetic anhydride) to produce 2-(4-acetyl phenyl) isoindoline-1,3-dione ($A_2$), thirdly this compound condensed with various substituted benzaldehydes affording chalcones ($A_3$- $A_{12}$) were reacted with hydrazine hydrate to produce pyrazole compounds ($A_{13}$- $A_{22}$).

The prepared compounds were characterized by determination of melting point, FT-IR and some of the prepared compounds have been characterized by ($^1$H-NMR and $^{13}$C-NMR) techniques.

***Keywords****: Claisen 1,2-addition, chalcones, pyrazol, phenylcarbamoyl, isoindoline.*

## Introduction

Heterocyclic compounds are very widespread in the natural and in non-natural molecules, from this they are used as an essential compounds in the life, many compounds such as vitamins, essential amino acids, hormones and the synthetic drugs includes heterocyclic ring system.

Isoindoline-1,3-dione are very important compounds in the pharmacological and synthetic fields because they contain two amid bonds –CO-N-CO- which produce an imide ring [1- 2- 3] they are hydrophobic and neutral therefore cross biological membranes in vivo. These compounds possess considerable biological effects like anti-cancer [4] , antimicrobial [5] , anti-virals [6] , anxiolytics [7] , anti-inflammatory [8] and anticonvulsant [9] .

Chalcones and substituted chalcones are aromatic derivatives of α, β- unsaturated ketones with one unsaturated position [10] . the properties of chalcones depend on suitable substituted groups on the ring and the presence of α, β- unsaturated group [11] . Chalcones showed a biological activity such as anticancer [12] . antioxidative [13] , antimalarial [14] ,antiangiogenic [15] , antibacterial [16] , immunosuppress [17] , antiparasitic, antileishma [18] , antidiabetic [19] , anal-gesic [20] and anti-inflammatory [21] .

Pyrazole heterocyclic compound has a five-membered ring containing two nitrogen atoms and because they have two nitrogen atoms they are prepared by many methods, one of these methods is the condensation of hydrazine or substituted hydrazine with α, β- unsaturated carbonyl compounds [22] , pyrazole used as intermediates for the many syntheses of new compounds which have biological activity. They possess medicinal properties, like anti-inflammatory, antibacterial [23-24] antioxidant [25] , anti-diabetic [26] , antimicrobial [27] , antiviral [28] and antimalarial [29] .

**Experimental**

## Materials and Method

4–Aminoacetophenone, phthalic anhydride, hydrazine hydrate, acetone, glacial acetic acid, ethanol and all aromatic aldehydes are providing from Fluka, BDH and Aldrich, they used without further purification.

Melting points of the compounds were determined by using an electro-thermal digital device and were not corrected. FT-IR spectrum was recorded on Shimadzu FTIR-8400 spectrophotometer as KBr disc Tikrit University in Iraq. $^{1}$HNMR and $^{13}$CNMR spectra were registered on Bruker spectroscopic ultra-shield magnets 300 MHz instruments using tetramethylsilane (TMS) as an standard and Dimethyl Sulfoxide -d6 as a solvent.

## Preparation Methods

### Preparation of compound ($A_1$). [30]

(0.01 mol) 1.4g of isobenzofuran-1,3-dione was dissolved in (20 mL) of acetone in a round-bottom flask fitted with dropping funnel. The funnel continued supplied with (0.01 mol) 1.35 g of p-amino acetophenone dissolved in (10 mL) of acetone, the solution of amino acetophenone and acetone was added to the mixture of (isobenzofuran-1,3-dione and acetone) dropwise with stirring for (2) hours. The produced precipitate was purified by filtered and recrystallized from ethanol, some of the physical properties are given in table (1).

### Preparation of compound ($A_2$). [32]

Compound ($A_1$) (0.02 mol, 5.66 g) in (50 mL) of acetic anhydride was mixed with (0.25 g) of anhydrous sodium acetate and refluxed for 6 hours with stirring. The reaction mixture was refrigerated and poured into crushed snow together with stirring; the precipitate was filtered, dehydrated and recrystallized from acetone. The physical properties are showing in table (1)

### Preparation of chalcones ($A_3$-$A_{12}$). [32]

A mixture of compound $A_2$ (0.008 mol, 2.12g) and substituted benzaldehydes (0.008 mol) was dissolved in (30 mL) of ethanol, a solution of aqueous potassium hydroxide (15 ml, 40%) was added. The mixture was stirred for (6-8) hours at room temperature. The resulting mix kept in a good conditions until the morning of the next day at room temperature, poured into crushed snow and HCl has been added to equivalent the base. The produced precipitate was purified by filtered and recrystallized from ethanol, some of the physical properties are given in table (2).

| Comp. No | R | Molecular Formula | M.wt (g/mol) | M.p oC | Yield % | Color |
|---|---|---|---|---|---|---|
| A3 | H | C23H15NO3 | 352.997 | 86-88 | 87 | Yellow |
| A4 | 4- Br | C23H14NO3Br | 431.901 | 206-208 | 88 | Light Yellow |
| A5 | 4- Cl | C23H14NO3Cl | 387.45 | 196-198 | 81 | Light Yellow |
| A6 | 4-OH | C23H15NO4 | 368.99 | 214-216 | 71 | Light Yellow |
| A7 | 4- OCH3 | C24H17NO4 | 382.996 | 165-167 | 91 | Yellow |
| A8 | 2,4- DiCl | C23H13NO3Cl2 | 421.903 | 202-204 | 86 | Light Yellow |
| A9 | 4- NO2 | C23H14 N2O5 | 397.95 | 159-161 | 73 | Dark Brown |
| A10 | 4- N(CH3)2 | C25H20N2O3 | 395.97 | 108-110 | 89 | Reddish Orang |
| A11 | 2- Br | C23H14NO3Br | 431.901 | 112-124 | 84 | Yellow |
| A12 | 3,4- DiOCH3 | C25H19NO5 | 413 | 148-150 | 92 | Yellow |

**Preparation of pyrazole compounds ( $A_{13}$-$A_{22}$)** (33)

(0.004 mol) of hydrazine hydrate and (0.004 mol) of chalcones dissolved in 30 mL glacial acetic acid, the mix was refluxed for 8 h, then cooled and pour on 50 mL of ice water. The produced precipitate was purified by filtered and recrystallized from ethanol, some of the physical properties are given in table (3).

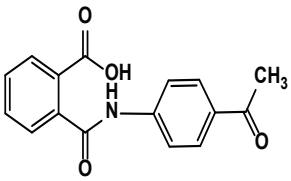
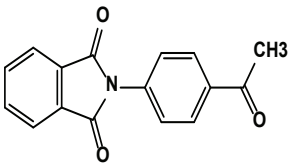
## Results and Discussion

The first step includes the synthesis of 2-(4-acetyl phenyl carbamoyl) benzoic acid from the reaction between phthalic anhydride and 4-aminoacetophenone. The second step includes the synthesis of 2-(4-acetyl phenyl) isoindoline-1,3-dione via reaction a mixture of 2-(4-acetyl phenyl carbamoyl) benzoic acid with (anhydrous sodium acetate and acetic anhydride). The third step includes the synthesis of chalcones **($A_3$-$A_{12}$)** via reaction of 2-(4-acetyl phenyl) isoindoline-1,3-dione with various substituted benzaldehydes, finally production of pyrazole compounds **($A_{13}$-$A_{22}$)** via condensation of chalcones **($A_3$-$A_{12}$)** with hydrazine hydrate. Structures of all compounds that prepared were diagnosed by FTIR, $^1$HNMR and $^{13}$CNMR techniques.

Identification of compounds ($A_1$), ($A_2$)

Compound ($A_1$) given a bands in FTIR spectrum at (3403)$^{cm-1}$ and (3233)$^{cm-1}$ denote to stretching vibration of (NH) group and stretching vibration of υ(OH) of amide group, other absorptions appeared at (1647)$^{cm-1}$ and (1708 )$^{cm-1}$ denote to υ(C=O) of amide group and υ(C=O) of carboxylic group. Note table (4). Compound ($A_2$) exhibit bands at (1708, 1663)$^{cm-1}$ denote to υ(C=O) bond of imide and at (1326)$^{cm-1}$ for υ(C-N) bond , Note and table (4).

**Table (4): Shows the IR data of compound ( $A_1$ , $A_2$)**

| Co.No | Compound Structure | IR (KBr) $cm^{-1}$ | | | | | |
|---|---|---|---|---|---|---|---|
| | | υ(O-H) Carboxylic | υ(N-H) Amide | υ(C=O) carboxylic | υ(C=O) imide | υ(C=O) amide | υ(C-N) imide |
| $A_1$ |  | 3233 | 3403 | 1708 | - | 1647 | - |
| $A_2$ |  | - | - | - | 1708<br>1662 | - | 1326 |

$^1$H-NMR spectrum for compound ($A_1$), (in Dimethyl Sulfoxide -d6 as a solvent) exhibit a singlet signal at δ(2.43) ppm denotes to $CH_3$ group, also noted a multiple signals at δ(7.56-7.98)ppm indicate to the protons of aromatic ring and singlet signal at δ(10.69) ppm denotes to N-H group, another singlet signal at δ(13.09) ppm for O-H carboxylic group, the singlet signal at δ(2.5) ppm indicate to two $CH_3$ groups in a solvent DMSO, , while compound ($A_2$) (in Dimethyl Sulfoxide -d6 as a solvent) exhibit a singlet signal at δ(2.75) ppm denotes to $CH_3$ group, also noted a multiple signals at δ(7.34 -8.18) ppm indicate to the protons of aromatic ring, the singlet signal at δ(2.5) ppm indicate to the two $CH_3$ groups in a solvent DMSO.

$^{13}$CNMR spectrum of compound ($A_1$), (in Dimethyl Sulfoxide -$d_6$ as a solvent) exhibit a signals at δ(26.91) ppm denotes to $CH_3$ group, at δ(168.36) ppm denotes to amide carbonyl group (N-C=O), at δ(167.73) ppm denotes to (C=O) carboxyl group, another signal at δ(198.02) ppm denotes to (C=O) ketone group and multiples signals at (119.15-144.32)ppm denotes the carbons of aromatic ring, while $^{13}$C-NMR spectrum of compound ($A_2$) exhibit an signal at δ(27.29) ppm denotes to $CH_3$ group, an signal at δ(167.09) ppm denotes to imide carbonyl group (C=O), an signal at δ(197) ppm denotes to carbonyl group (C=O) of ketone and multiple signals at δ(124-136.27) ppm denotes to the carbons of aromatic ring.

**Identification of Chalcones ($A_3$-$A_{12}$).**

Chalcones ($A_3$-$A_{12}$) were prepared via reaction of aromatic benzaldehydes with 4-(isoindolin-2-yl-1,3-dione) acetophenone in absolute ethanol in presence 40 % KOH. The reaction follows the following mechanism(34)

The Chalcones ($A_3$-$A_{12}$) were identification by melting point, FT-IR spectra, $^1$HNMR and $^{13}$CNMR. IR spectrum of compound ($A_6$) exhibited bands at (1681) $^{cm-1}$, ,(1655)$^{cm-1}$,(1583,1525)$^{cm-1}$, (1326)$^{cm-1}$ denotes to stretching vibration of υ(C=O) of ketone, υ(C=C) of aliphatic, υ(C=C) of aromatic, and υ(C-N) of imid group respectively.

**Financial Disclosure:** There is no financial disclosure.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Ministry of Education, Iraq and all experiments were carried out in accordance with approved guidelines.

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# Bacteriological Study of Eye infection in Baghdad City

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## Abstract

The present study included 250 clinical samples during the period between December 2018 – April 2019 on 250 patients with ophthalmological infections of both sexes & different ages ( 3 days - 75 years old) , attend to ophthalmological clinic in hospital Ibn-AL-Hythem for eyes infection in Baghdad. The ophthalmological infections classified into 3 types according to the anatomical site of involvement. The first group was conjunctivitis(200)case, the 2nd was Blepharitis (35) case & the 3rd was Keratitis ( 15) cases. Isolation of the causative micro-organisms for the previous infections, culture & sensitivity test to different antimicrobial agents were done. The results showed that 200(229.4 )% are you giren significant growth of bacteria while 50(69.07% ) were no growth for bacteria . Include *Staphylococcus aureus*(77.6%),*Staphylococcus epidermidis* (13.6%) , *Streptococcus pneumonia*(6.4%) & *Streptococcus pyogenes*(2.1%) , while G-ve isolates 61(30.5%) include (7) species of bacteria ; *Haemophilus influenzae(81.9%), Klebsiella pneumonia(6.5%), Proteus spp & Pseudomonas aeruginosa*, the Same (3.2%) for each & finally *Neisseria gonorrhoeae*, *Moraxella spp, Acinetobacter* were the least(1.6%) for each. Antimicrobial (12 agents) susceptibility of the bacterial isolates revealed marked resistant of these isolates for most antimicrobial agents e.g. Penicillin (87.8%),amoxicillin/clavulanicacid(84.4%),cephalexien(83.9%),erythromycin(83.4%), ampicillin (71.3%) while the least resistant(8.2%) reported for ciprofloxacin.

***Keyword:*** *Eye infection, Bacteria, Resistance Antibiotics, Baghdad.*

## Introduction

The eye is the most exposed part in the body to the air which carries dust and microorganisms such as bacteria and fungi causing infections to the eye, especially when any scratch or wound occurs in the lining tissues of the eye, as these microorganisms quickly settle into the broken tissues, causing significant eye damage [1], including conjunctivitis which is called ‘’red eye’’ or ‘’pink eye’’ which involves inflammation of the soft layer that covers the sclera of the eye and this disease may affect one eye or may spread to the other eye [2]. Keratitis may form holes, most likely resulting from conjunctivitis and the spread of toxins produced by the microorganisms that cause these conditions [3]. While blepharitis caused by microorganisms, and the injury may be external if it is outside the line between the inside and outside the eye, or internal when it is on the inner surface of the eyelids [4]. These infections occur despite the eye’s resistance to external influences through various mechanisms such as wetting by tears containing the bactericidal lysozyme enzyme, mucous membrane and eyelid movement [5], as this resistance may weaken people suffering from certain diseases such as malignant tumors and organ transplantation, as well as people who take antibiotics or cortisones for long times, drug addicts, or diabetic and AIDS patients [6].

Bacterial types that may cause eye infections include *Staphylococcus aureus, Staphylococcus epidermidis, Bacillus subtilis, Bacillus cereus, Pseudomonas aeruginosa, Neisseria gonorrhea, Moraxella spp. , Streptococcus pneumonia, Hemophilus influenza and Acinetobacter etc*.[7]. Eye infections are often treated by antibiotics before performing the antibiotic sensitivity test, therefore, broad spectrum antibiotics such as ciprofloxacin, ofloxacin, chloramphenicol, tetracyclin, erythromycin and gentamycin are used for treatment [8]. As a result of the wide and random use of these antibiotics, the microorganisms showed resistance leading to the appearance of spontaneously mutated bacterial isolates with high ability to resist antibiotics [9], or due to the bacterial plasmids which are responsible for antibiotic resistance as there are conjugative plasmids

having the ability to transfer from one bacteria to the other within the same species or even from anβother bacterial genera, and their transmission will lead to the appearance of resistance characteristics among these isolates [10], or the reason for the resistance may be the change of the target location to the antibiotic so that the antibiotic loses its effect on the microorganism or as a result of the production of β-lactamase enzymes which destroy destroy the anti β-lactum antibiotics, including Penicillins and Cephalosporins. β-lactum antibiotics [11].

## Materials and Method

### Sample collection

From patients who visited the ophthalmic consultative clinic in hospital Ibn-AL-Hythem for eyes infection in Baghdad 250 clinical samples were collected from three parts of the eyes (the conjunctiva, the cornea and the eyelids). The patients included both males and females with less than 75 years of age for the period from December 2018 to April 2019. A special form was prepared for each patient in which some important information such as age, gender, type of work, residence and antibiotic use were recorded. All patients were clinically examined by specialist doctors. Samples were collected by sterile cotton swabs containing transport media, and transferred to the hospital's laboratory for culturing on blood, MacConkey and chocolate agars, then incubated for 24 hours at $37C^0$ [12]. Bacterial isolates were then diagnosed depending on morphologic al characteristics including( colony size, color, edge and height). After that, thin smears were prepared from these isolates and stained with Gram stain to observe bacterial ability to stain and study their shapes and arrangements, and diagnosed by using the biochemical tests as mentioned by [13]. The diagnosis was confirmed by using the Api 20 Staph for *Staphylococci*, Api 20 Strept. for *Streptococci* and Api 20 E for the diagnosis of Enterobacteriace.

### Antibiotic sensitivity test of bacteria

The disc diffusion method was used to perform the antibiotic sensitivity test for the bacterial isolates, by using 12 antibiotic discs according to the method of Brook, et al [14], as a part of the pure colonies was transferred into test tubes containing 5 ml of liquid Muller Hinton and incubated at 37C for 24 hours. The growth was diluted, when necessary, with normal saline until the turbidity became homogenous with the turbidity of the solution in McFarland tube, which gives approximate number of cells about ($1.5x10^8$) cells/ml. Then the cotton swabs were introduced into the tubes containing bacterial growth, and the excess was removed by pressure on the inner walls of the test tubes, and swabs were streaked on the surfaces of solid Muller Hinton media in different directions to ensure equal spread of bacteria, followed by placing 12 antibiotic discs including Vancomycin, Neomycin, Ciprofloxacin, Erythromycin, Cephalixein, Gentamycin, Amoxocillin/Clavulanic acid, Penicillin, Ampicillin, Chloramphenicol, Cefotaxim and Tetracycline) provided by Bioanalysis company (Turkey), on the surface of the culture media which was inoculated with the bacterial culture by using sterile forceps that were pressed gently on the antibiotic discs. The plates were incubated for 24 hours at 37C and the results were compared by measuring the growth inhibition area around the antibiotic discs, and results were explained according to CLSI [1].

## Results and Discussion

### Isolation and identification of bacteria

Results of this study showed that 200 (229.4%) samples yielded bacterial growth, while 50 (69.07%) samples showed no bacterial growth after clinical diagnosis by specialist doctor. All the studied patients were suffering from conjunctivitis, keratitis and eye inflammation as shown in table (1). Negative microbial infections may be attributed to bacteria and fungi other than those included in our study such as chlamydia, fungi, viruses and parasites or because of allergy [15],The all these samples were cultured on selective media and confirm identification by biochemical tests as shwn in table (1)that refer to growth bacteria indifferent percentage.

**Table (1): Percentage of bacterial growth in eye infeaction parts of the eye**

| Infected area | No. of samples | No. of samples which gave positive results to | | No. of samples which gave negative bacterial growth | Percentage |
|---|---|---|---|---|---|
| | | Bacterial growth | percentage | | |
| Conjunctivitis | 200 | 159 | 79.5 | 41 | 20.5 |
| Eyelid infection | 35 | 32 | 91.4 | 3 | 8.57 |
| Keratitis | 15 | 9 | 60 | 6 | 40 |
| Total | 250 | 200 | 229.4 | 50 | 69.7 |

The isolates involved 11 Gram positive and Gram negative bacterial types, as the Gram +ve bacteria were 139(69.5%) isolates distributed into 77.6% *S. aureus,* 13.6% *S. epidermidis*, 6.4% *St. pneumonia* and 2.1% *St. pyogenes*, while the number and percentage of Gram –ve bacteria were 61(30.5%) including 7 types of bacteria distributed as *Hemophilus influenza* (81.9%), while the percentage of *Klebsiella pneumonia* (6.5%), and each of *Pseudomonas* and *Proteus spp*. were (3.2%) While all of the bacteria *Neisseria gonorrhoeae*, *Moraxella. sppand Acinetobacter.spp* The lowest percentages were 1.6%as shown in table (2). Our results were almost close to those of Al-Sabaawi (2005) who isolated *S. aureus, S. epidermidis, Bacillus* subtilis, *Bacillus cereus*, *Pseudomonas aeruginosa, N. gonorrhea and Moraxella spp*. in the percentage of (51, 3.2, 19.8, 8.3, 5.2,1 and 11.5) respectively.

The increase of S. aureus infection may be attributed to their normal existence on the skin and air and even in the eyes as micronormal flora and they may become pathogenic under certain conditions such as immunocompromised patients with chronic diseases as these bacteria can cause infections to the conjunctiva, cornea and eyelids or they may be transmitted by contaminated hands as well as having virulence factors such as enzymes and toxins e.g. protease and lipase [16]. S. *epidermidis* is a normal flora of the skin but they can cause infection to immunocompromised hosts [17]. Streptococcus spp. also causes eye infections. In a study done by [4], they could isolate (9%) of *S. pneumonia* from conjunctivitis conditions. Both of *H. influenza* and *Proteus* vulgaris were found to cause eye infections, as well as *Pseudomonas aeruginosa* due to its widely-distribution in environment and its ability to adapt and secrete protease and collagenase enzymes causing conjunctivitis and secondary keratitis. Other causes of eye infection is *N. gonorrhea* bacteria which may lead to blindness. It infects newborns since it is transmitted from the infected mother to her baby because it infects the reproductive system [14,18].

**Table (2): Bacteria isolated from infected eyes**

| No. | Causative agent | No. of isolates | Percentage |
|---|---|---|---|
| **1** | **Gram positive bacteria:**<br>*S. aureus,*<br>*S. epidermidis*<br>*St. pneumonia*<br>*St. pyogenes* | <br>108<br>19<br>9<br>3 | <br>77.6<br>13.6<br>6.4<br>2.1 |
| | *Total number* | **139** | **69.5** |

***Cont...*** **Table (2): Bacteria isolated from infected eyes**

| | | | |
|---|---|---|---|
| 2 | Gram negative bacteria<br>H. influenza<br>Klebsiella pneumonia, Pseudomonas aeruginosa, Proteus spp.<br>N. gonorrhea<br>Acetinobacter .spp<br>Moraxella .spp | 50<br>4<br>2<br>2<br>1<br>1<br>1 | 81.9<br>6.5<br>3.2<br>3.2<br>1.6<br>1.6<br>106 |
| | Total number | 61 | 30.5 |
| | Total summation | 200 | 100 |

**Antibiotics sensitivity test**

Antibiogram test was carried out by using different types of antibiotics and results showed different levels of resistanceas shown in table(3). Gram +ve bacteria, represented by *S. aureus, S. epidermidis, St. pneumonia* and *St. pyogenes* showed different resistances to the antibiotics where S. aureus showed the highest resistance rate to the cephalexein and penicillin (92.5 and 91.6) respectively, while these bacteria showed the highest sensitivity rate to ciprofloxacin (7.4%). Regarding *S. epidermidis* bacteria, the results revealed that they showed the highest resistance rate to cephalexein (89.4%), while they showed the lowest resistance rate to the antibiotics ampicillin, ciprofloxacin and vancomycin (21%) for each one.

The result on the sensitivity of *S.aureus* to ciprofloxacein were close to the results of Barid [4] who found that the resistance of these bacteria was low to the antibiotic, however, they showed high resistance to Penicillin. Marlin [26], in his study, also found that ciprofloxacin was very active against *S. aureus* strains, because this antibiotic inhibits bacterial growth through the inhibition of DNA gyrase enzyme which is responsible for spiral recoiling of DNA and insures their being apart during transcription process.

While both *St. pneumonia* and *St. pyogenes* also showed different responses to these antibiotics. In table (3), it is observed that *St. pneumonia* showed the highest resistance rate (88.8%) to amoxocillin/clavulanic acid, penicillin, ampicillin and tetracycline, while it showed the highest sensitivity rate (100%) aginst ciprofloxacin. *Streptococcus pyogenes* showed (100%) resistance to Penicillin, while the lowest resistance rate (33.3%) was to the antibiotics ciprofloxacin, cefotaxime, chloramphenicol, neomycin, Gentamycin and vancomycin.

Gram negative bacteria isolated in our study showed different responses to antibiotics (table 3). *Hemophilus influenza* showed (100%) resistance to Amoxocillin/ Clavulanic acid, while the lowest resistance rate (7.4%) was to ciproflaxocin and cephotaxim, whereas *Klebsiella pneumonia* showed (100%) resistance to amoxocillin/ clavulanic acid, penicillin, Ampicillin, erythromicin, vancomycin, tetracyclin and chloramphenicol, but it was sensitive to ciprofloxacin.

Pseudomonas aeruginosa showed (100%) resistance to Amoxocillin/Clavulanic acid, but showed no resistance to Ciprofloxacin.

The result in table (3) demonstrated that *N. gonorrhea* were (100%) resistance to amoxocillin/ clavulanic acid, penicillin, ampicillin, vancomycin and cephalexein, and showed no resistance to penicillin, cephotaxime, Neomycin, gentamycin, ciprofloxacin, erythromycin, chloramphenicol and tetracycline. my results agreed with [4] in regard to the highly sensitivity of Erythromycin to all N. *gonorrhea* isolates.

*Moraxella spp*. showed (100%) resistance to amoxocillin, penicillin, ampicillin, cephalexin , cephotaxime and tetracycline, but showed no resistance to neomycin, gentamycin, ciprofloxacin, erythromycin,

vancomycin and chloramphenicol. my results agreed with [3] on the effectiveness of Chloramphenicol as a broad spectrum antibiotic with a high activity against *Moraxella spp*.

It was also shown that *Proteus spp*. showed (100%) resistance to penicillin, cephotaxime, tetracycline and chloramphenicol, but showed no resistance to ciprofloxacin, cephalexin and gentamycin, which agreed with [4] about the effect of cephotaxime, chloramphenicol and tetracycline on *Proteus spp.* which showed (100%) resistance to these antibiotics.

## Conclusion

The concluded from This study that Ciprofloxacin was the most effective antibiotic on the studied bacteria, and this may be explained by the fact that local isolates didn't develop high resistance to this antibiotic due to its limited use in comparison with Penicillin and also because Ciprofloxacin is a broad spectrum antibiotic.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Institute of Medical Technology and all experiments were carried out in accordance with approved guidelines.

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# Effectiveness of an Instructional Program on Hypertensive Patients' Knowledge toward Prevention of Cerebral Vascular Accident at Al-Razi Center in Al-Basra City

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## Abstract

**Introduction:** Stroke is a neurological condition that is one of the leading causes of death and disability in many low and middle income countries. However, many adjustable risk factors have become important. High blood pressure is the most common stroke risk factor globally as well as in our country, Basra.

**Objectives:** To assess knowledge of patients with hypertension concerning prevention of cerebral vascular accident. To construct an instructional program for patients with hypertension concerning prevention of cerebral vascular accident. To evaluate the effectiveness of an instructional program on the knowledge of patients with hypertension concerning prevention of cerebral vascular accident. To know the association between level of knowledge the association between level of knowledge concerning prevention of cerebral vascular accident and socio-demographic variables.

**Methodology:** : A quasi- experimental design (two group pre- test and post-test) was conducted in the present study which is carried out at

Al-Razi Center in Al-Basra City from 8th of September 2019, to 16th of March, 2020. A non – probability (purposive) sample of (60) patients with hypertension were selected.

**Conclusion:** There is significance need for educational program between (residency, type of family, duration of illness, habits and regularity of hypertension treatment) to prevention serious complication which stroke.

***Key words:*** *Hypertensive, Prevention, Cerebral Vascular Accident.*

## Introduction

High blood pressure is not a disease but it is an important risk factor for cardiovascular complications. It is known as a condition in which the blood pressure is raised to the point where signs and symptoms of hypotension appear. About 77.9 million American adults (one in 3 people) and a billion people worldwide have high blood pressure [(1)]. Also, high blood pressure is a serious problem in developing countries where there is a transition from infectious diseases to chronic non-communicable diseases. In addition, complications from high blood pressure increase with age (such as heart failure, stroke, and kidney failure). One in four people aged 18 years or over has high blood pressure in developed countries [(2)].

A cerebral vascular accident (CVA) or "stroke" is a rapid loss of brain function due to a disorder of blood flow to the brain part. The term stroke is used to describe to health-care and general practitioners that a stroke is an emergency situation similar to a heart attack [(3)].

As well as, A stroke is defined as a rapid onset (within minutes) of the focal central nervous system and signs and symptoms lasting 24 hours or more, and it occurs for an unknown or secondary cause of other diseases. In our time, it is caused by a neurological disease, (1.5 / 1000 / year) increases with age to (10/1000 / year at 75 years). It has caused the death of one person in every eight cases, and has caused a tremendous burden of powerlessness and sadness for patients, their relatives and the wider community [(4)].

## Methodology

**Design of the Study:**

A quasi- experimental design was used in the present study. Data collection was done at two times: baseline data (before any intervention was provided to the study group) and data that are collected 14 days after giving the instructional program for study group. The period of the study extended from 8th of September 2019, to 16th of March, 2020.

**Setting of the Study:**

The study was conducted at the Al-Razi Center, which treats high blood pressure and diabetes patients in Basra.

**Sample of the Study:**

Non – probability (purposive) sample of (60) high blood pressure patients were selected. They selection of patients was built on the following criteria:

**Method Data Collection:**

The data was collected through the use of A structured questionnaire, the researcher assumed full responsibility for interviewing the study sample after explaining and clarifying the objectives of the study for the adults, after obtaining the initial approval of each patient to participate in the study.

Data collection was carried out from 2nd January to 1st February, 2020.

Spend approximately (5-15) minutes with each patient to the interview and complete the questionnaire.

**The Study Instrument:**

The study tool is a questionnaire that was designed for the purpose of the study after extensive reviews of accessible literature and related studies. The study tool consists of five parts:

**Part I: Socio-demographic Characteristics of the Sample of the Study**

This part deals with demographic characteristics of the sample consists of age , gender, level of education , marital status, occupation, place of residence, duration of illness, habits, family history of hypertension, type of family, socioeconomic status, patient past history and taking antihypertensive treatment regularly.

**Part II: General information regarding Hypertension.**

This part was designed to include (14 items) that represented the information of patient related to hypertension.

**Part III: Assessment of Patient`s Knowledge Concerning stroke**

This part of the questionnaire consists of (11 multiple choice questions) of patient's knowledge concerning stroke.

**Part IV: Information regarding Prevention of Stroke among Hypertensive Patient**

This part of the questionnaire consists of (13 multiple choice questions) prevention of stroke.

**Part V: knowledge concerning hypertensive Medication**

This part was consists of (8 items) which include strongly disagree, disagree and agree.

**Data Analysis**

Data from this study were analyzed using SPSS version 24.0. The following statistical data analysis methods were used to analyze and evaluate the results of the study (Frequencies, percent Mean of score (MS), Pearson Correlation Coefficient, Standard Deviation and Chi-square, Paired sample T-test, Analysis of Variance (ANOVA), Independent t-test).

## Results

**Table (1) Distribute the sample according to their clinical characteristics**

| List | Characteristics | Study Group | | Control Group | | $X^2$ | df | P-value | Sig. |
|---|---|---|---|---|---|---|---|---|---|
| | | f | % | f | % | | | | |
| 1 | **Duration of illness** | | | | | | | | |
| | < 1 year | 0 | 0 | 0 | 0 | 5.958 | 6 | 0.202 | N.S |
| | 1 – 2 years | 8 | 26.7 | 4 | 13.3 | | | | |
| | 3 – 4 years | 8 | 26.7 | 7 | 23.3 | | | | |
| | 5 ≤ years | 14 | 46.7 | 19 | 63.3 | | | | |
| | Total | 30 | 100 | 30 | 100 | | | | |
| 2 | **Habits** | | | | | | | | |
| | Smoking | 4 | 13.3 | 3 | 10 | 10.838 | 6 | 0.028 | S |
| | Nonsmoking | 17 | 56.7 | 23 | 76.7 | | | | |
| | Drink alcohol | 0 | 0 | 0 | 0 | | | | |
| | Doing exercise | 9 | 30 | 4 | 13.3 | | | | |
| | Total | 30 | 100 | 30 | 100 | | | | |
| 3 | **Family history of hypertension** | | | | | | | | |
| | No | 9 | 30 | 6 | 20 | 0.347 | 2 | 0.556 | N.S |
| | Yes | 21 | 70 | 24 | 80 | | | | |
| | Total | 30 | 100 | 30 | 100 | | | | |
| 4 | **On regular hypertensive treatment** | | | | | | | | |
| | No | 6 | 20 | 8 | 26.7 | 5.615 | 2 | 0.18 | S |
| | Yes | 24 | 80 | 22 | 73.3 | | | | |
| | Total | 30 | 100 | 30 | 100 | | | | |
| 5 | **Suffering from other disease** | | | | | | | | |
| | No | 16 | 53.3 | 18 | 60 | 1.692 | 2 | 0.193 | N.S |
| | Yes | 14 | 46.7 | 12 | 40 | | | | |
| | Total | 30 | 100 | 30 | 100 | | | | |

f: Frequency, %: Percentage, $X^2$: Chi-square, df: degree of freedom, p: Probability, Sig: Significance, S: Significant, N.S: Not significant

This table indicates a duration of illness is (5≤ years) for patients among the study group (46.7%) and among the control group (63.3%).

Regarding daily habits, more than half of patients among the study group are nonsmokers (56.7%) and (30%) of them are doing exercise. Among the control group, the highest percentage of patients also show that (76.7%) of them are nonsmokers and only (13.3%) of them are doing exercise.

More of the patients among the both groups; the study and control showing that they having a family history of hypertension (70% and 80%); they also show that more of them are on regular treatment of hypertension (study group= 80% and control group= 73.3%).

Regarding suffering from other diseases, only (46.7%) of the patients among the study group and (40%) among the control group are suffering from other diseases.

**Table (2) Level of Patients' Knowledge about Prevention of Stroke**

| Levels of Knowledge | Study Group (N= 30) | | | | Control Group (N= 30) | | | |
|---|---|---|---|---|---|---|---|---|
| | Pre-test | | Post-test | | Pre-test | | Post-test | |
| | f | % | f | % | f | % | f | % |
| Poor | 27 | 90 | 0 | 0 | 29 | 96.7 | 29 | 96.7 |
| Fair | 3 | 10 | 0 | 0 | 1 | 3.3 | 1 | 3.3 |
| Good | 0 | 0 | 30 | 100 | 0 | 0 | 0 | 0 |
| Total | 30 | 100 | 30 | 100 | 30 | 100 | 30 | 100 |

f: Frequency, %: Percentage

Poor= 0-3, Fair= 4 -7, Good= 8-11

This table shows the level of patients' knowledge regarding prevention of stroke; the finding among the study group indicates that the patients during the pre-test time showing poor level of knowledge (90%). The level of knowledge is increased during the post-test time to good level among all patients (100%).

The patients among the control group showing poor level of knowledge during the pre-test and post-test time (96.7% and 96.7%).

## Discussion

The findings of the study underhand depict that (76.7%) of patients are females among both groups; the study and control. Kisokanth etal., [6] supported present study by the gender there were (59.0%) of samples females.

Regarding the educational level of patients; the results of the present study reveals that the highest percentage of patients are graduated from primary school, among the study group (26.7%) and control group (36.7%). This conclusion is supported by Tesha , [7] who concluded that (40.6%) of the sample were primary school.

As regards the occupation the results of the present study indicate that (43%) of patients are working and (40%) are housewives among the study group; among the control group, (46.7%) of them are housewives and (23.3%) of them are working. These findings come along with Jarelnape ,[2] who stated that (73%) of patients were working.

Beside the residence, the findings of the current study reveal that more of the patients are residents in an urban area among the study group (76.7%) and among the control group (86.7%). These results are consistent with Haghighi etal., [8] stated that (84.7%) of participant's resident in urban areas.

Concerning the marital status among both groups. the results of the present study depict that the study and control show that more of them are married with the highest percentages (study group= 76.7% and control group= 86.7%). These findings identical with Dar etal., [9] who have been found that (86.5%) of the sample were married.

Regarding family type, the results of current study describe that the majority of patients are living in extended families among both groups; the study and control groups (90% and 93.3%). These results incongruent with Jayalakshmi,[10] Who reported that the type of family 45 (75%) were comes under nuclear family and 22 (25%) were comes under join family.

Moreover, the social and economic level the finding of the present study depicts that patients among the study group associated with moderate socioeconomic level (76.7%), while those in control group refer that with

high socioeconomic level (76.7%). These results come along with Bollampally eta.,[1] stated that (66.25%) of participants with moderate socioeconomic levels.

Regarding duration of illness the results of current study indicate a duration of illness is (5≤ years) for patients among the study group (46.7%) and among the control group (63.3%).These findings harmonizing with Kilic etal.,[11] who reported that sample of study had duration of hypertension is more than 5 years (32.4%).

Regarding daily habits, the finding of the study under hand reveal that more than half of patients among the study group are nonsmokers (56.7%) and (30%) of them are doing exercise. Among the control group, the highest percentage of patients also show that (76.7%) of them are nonsmokers and only (13.3%) of them are doing exercise.

Regarding family history of hypertension, the results of the current study revealed that more of the patients among both groups; the study and control showing that they having a family history of hypertension (70% and 80%). These findings are congruent with Sadeq and Lafta,[13] who found that (63.9%) of a sample they having a family history of hypertension.

Moreover, the finding of the present study show that more of patients are on regular treatment of hypertension (study group= 80% and control group= 73.3%).These findings identical with James,[14] who indicated that duration of taking anti-hypertensive drugs, (45.0%) in the experimental group and (49.2%) in the control group had more than 1 to 5 years duration of taking antihypertensive medicine.

Beside Suffering from other disease, the findings of study underhand reveal that only (46.7%) of the patients among the study group and (40%) among the control group are suffering from other diseases. These results supported with AbdelSalam and El-SayedSoliman, [15] referred that majority of participants (80%) were hypertensive and about two thirds (65%and 66.7%) were diabetic and obese respectively.

The findings of present study reveal the level of patients' knowledge regarding prevention of stroke; the results among the study group report that the patients during the pre-test time showing poor level of knowledge (90%). The level of knowledge is increased during the post-test time to good level among all patients (100%).

These findings in same line with quasi experimental study conducted by Paul ,[16] who found levels of knowledge on prevention of cerebrovascular accident among hypertensive patients during pre-test show more than two third of the patients (71.67%) had inadequate knowledge.

## Conclusions

The present study concludes that there is significance need for educational program between (residency, type of family, duration of illness, habits and regularity of hypertension treatment) to prevention serious complication which stroke.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

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# Determination the Causes of Neonatal Mortality during the Last 3 Years Ago in Al-Kut City

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## Abstract

**Background:** Nearly 3 million babies die each year in their first month of life and a similar number die at birth. Notably, the first month of life of these children. That a quarter to half deaths occur in the first 24 hours and that 75% of them occur in the first week. The study aims: determine the causes of neonatal mortality in Kut City.

**Methodology:** A non-probability a convenience sample of (N=406) was collected through a review of NCUS records which were selected out from the main hospitals. The data were collected from a retrospective secondary data from death certificates, medical records and death records using the questionnaire deals with neonate age, gender, birth weight, and cause of death. Data are analyzed through the application of descriptive and inferential statistical data analysis approach that includes, frequencies and percentages; Chi-squared test. **Results:** The study results indicate that the (77.8%) of neonate aged less than five days and die. Regarding gender, most of them were male and their weight 1000-2000. There were a significant association between neonate age, and gender with the causes of their morbidity at p-value <0.05.

**Conclusion:** A less than five days of life male neonate weighted 1000-2000 kg die by respiratory distress syndrome affected by age and their gender. Health care providers need to be trained on neonatal resuscitation. All nurses and doctors involved in obstetrics and neonatal care should be trained in at least immediate care of the newborn.

***Key words:*** *Determination, Neonate, Morbidity, Al-Kut City.*

## Introduction

Newborn baby is the first live stage within 28 days after birth, which is considered the most important period of age as an indicator of physiological adjustment to life outside the womb. This period is very sensitive where comes the high rates of child mortality newborns from high susceptibility of exposure to disease and death in infants[1]. It was noted that the death of neonatal can be classified as an early age occur during the first seven days, while the late stage occurs after the seventh day but before 28 days of age, and therefore considered to be the most dangerous period due to the face of many diseases problems that lead to high rates of morbidity and mortality [2]. Wherever children who reported that prematurity, severely malformed, childbirth complications or bad hygiene practices were issues lead to inflammation, which ends with the death of the newborn die [3]. On the other hand, the large majority of newborns do not develop any problems or only serious difficulties requiring only the minimum, which can be provided by the parent with proper supervision by health workers take care of [2]. While mothers at high risk who were unsupervised and preterm or infants low birth weight is an experience to address where they are faced with a series of events likely to be life-changing as their children transition from fetal life newborn that the consequences could affect the health of the individual on their lives [4]. Pregnant women can be exposed innocently to the physical, psychological and behavioral conditions, or environmental harmful potential that can increase the risk of pregnancy. Even with optimal care

before birth, the fetus can suffer results in perinatal negative, such as premature birth, low birth weight, congenital malformations, and neonatal morbidity, or neonatal deaths. After birth, the risk factors related to the same mother to put newborns at risk of illness or injury may continue[6]. Preterm birth according to the World Health Organization, which referred to the birth before 37 weeks of termination of pregnancy. Is divided somewhat mildly that the completed pregnancy from 32 to less than 37 weeks, which includes late premature defined as 34 to less than 27 weeks of pregnancy [7]. Birth asphyxia also failed to start and maintain breathing at birth, can choke at birth resulting from inadequate O2 directly supply also before, during or after birth. It is estimated that the world be more important reason for the 2/3 neonatal death accounting for about 29% of deaths [8]. Birth weight less than 2.5 kg is called low birth weight is one of the most important determinants of neonatal mortality. It generates 15.5 per cent of all children with low birth weight, 95.6 per cent of them children in developing countries, all over the world [9]. Respiratory distress is the name applied to the weakness of the respiratory system in newborns, which are related to the delay in the growth of lung maturity. The death of nearly 20% of the deaths of newborn infants with 40,000of dye each year in the United States accounts [10]. Most deaths fall of neonatal sepsis in Eastern Europe, where between the ages of 0-6 days and 7-27 days.

## Methodology

**Study design:** A descriptive analytic study design aimed at determine the neonatal mortality during the last 3 years ago in Kut City.

**Study Sample:** A non-probability a convenience sample of (N=406) was collected through a review of NCUs records which were selected out from the main hospitals.

**Study Instrument:** Through a comprehensive review of the literature related to, the study design tool for the purpose of the study by the researcher, which were based on the causes of neonatal deaths. The instrument was examined by the supervisors and experts in the field who is knowledgeable about the issues around the care of the mother and newborn.

**Data Collection the Methods:** The data were collected from a retrospective secondary data from death certificates, medical records and death records using the questionnaire deals with neonate age, gender, birth weight, and cause of death.

**Statistical analysis:** The SPSS-ver.20 methodology is used to analyze and evaluate data from the study. A descriptive approach analysis of statistical data used to describe the study variables: frequencies and percentages; Statistical data deductive analysis approach: used by applying the Chi square test.

They obs. < crit. = insignificantly.They obs. > crit. = significantly,

Shortcuts for measuring important compared to the level, are used as follows:

(1) NS : Non significantly at probability-value>0.05.

(2) S : Significantly at probability-value <0.05.

(3) HS : Highly significantly at probability-value <0.01.

## Results

**Table (1): The Neonatal Characteristics**

| Variables | Rating | No. | % |
|---|---|---|---|
| Neonatal Age | <5 days | 316 | 77.8 |
| | 5-10 days | 67 | 16.5 |
| | 11-15 days | 12 | 3.0 |
| | 16-20 days | 6 | 1.5 |
| | >20 days | 5 | 1.2 |
| Gender | Male | 235 | 57.9 |
| | Female | 171 | 42.1 |
| Birth Weight | <900 | 39 | 9.6 |
| | 1000-2000 | 190 | 46.8 |
| | 2100-3100 | 142 | 35.0 |
| | 3200-4200 | 32 | 7.9 |
| | 4300-5300 | 2 | 0.5 |
| | >5400 | 1 | 0.2 |

This table indicate that the a male gender neonate death aged less than five days and weighted 1000-2000 kg.

**Table (2): The Causes of Neonatal Mortality During Last 3 Years ago**

| | Rating | No. | % |
|---|---|---|---|
| Causes of Neonatal Mortality | Congenital emphysema | 65 | 16.0 |
| | Sepsis | 84 | 20.7 |
| | Weight loss and age | 32 | 7.9 |
| | Congenital Anomalies | 37 | 9.1 |
| | Respiratory distress syndrome | 158 | 38.9 |
| | Jaundice | 3 | 0.7 |
| | Birth Defect | 1 | 0.2 |
| | Inhalation of uterine fluids | 1 | 0.2 |
| | Renal Failure | 1 | 0.2 |
| | Acute Weight Lose | 1 | 0.2 |
| | Pneumonia | 3 | 0.7 |
| | Heart abnormalities | 3 | 0.7 |
| | Brain Malformation | 9 | 2.2 |
| | Brian Hypoxia | 1 | 0.2 |
| | Congenital malformations of the respiratory system | 5 | 1.2 |
| | Platelet inflammation | 1 | 0.2 |
| | Underweight with low gestational age | 1 | 0.2 |

The respiratory distress syndrome were records the majority among causes of neonatal death.

**Table (3): Relationship between the causes of neonatal mortality and neonatal age**

| | **Rating** | **Age** | | | | | **Total** | **d.f** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **<5 days** | **5-10 days** | **11-15 days** | **16-20 days** | **>20 days** | | | | |
| Causes of Neonatal Deaths | Congenital emphysema | 54 | 9 | 1 | 1 | 0 | **65** | 64 | **obs.= 152.408 crit.= 83.675 P-value=0.000** | HS |
| | Sepsis | 42 | 30 | 3 | 4 | 5 | **84** | | | |
| | Weight loss and age | 28 | 3 | 1 | 0 | 0 | **32** | | | |
| | Congenital Anomalies | 35 | 2 | 0 | 0 | 0 | **37** | | | |
| | Respiratory distress syndrome | 137 | 18 | 3 | 0 | 0 | **158** | | | |
| | Jaundice | 2 | 1 | 0 | 0 | 0 | **3** | | | |
| | Birth Defect | 1 | 0 | 0 | 0 | 0 | **1** | | | |
| | Inhalation of uterine fluids | 1 | 0 | 0 | 0 | 0 | **1** | | | |
| | Renal Failure | 0 | 0 | 1 | 0 | 0 | **1** | | | |
| | Acute Weight Lose | 1 | 0 | 0 | 0 | 0 | **1** | | | |
| | Pneumonia | 3 | 0 | 0 | 0 | 0 | **3** | | | |
| | Heart abnormalities | 1 | 0 | 1 | 1 | 0 | **3** | | | |
| | Brain Malformation | 7 | 1 | 1 | 0 | 0 | **9** | | | |
| | Brian Hypoxia | 1 | 0 | 0 | 0 | 0 | **1** | | | |
| | Congenital malformations of the respiratory | 3 | 1 | 1 | 0 | 0 | **5** | | | |
| | Platelet inflammation | 0 | 1 | 0 | 0 | 0 | **1** | | | |
| | Underweight with low gestational age | 0 | 1 | 0 | 0 | 0 | **1** | | | |
| | Total | **316** | **67** | 12 | 6 | 5 | 406 | | | |

" Chi-square observer, Chi-square critical, Df= Degree of freedom, "P-value= Probability value", "S= significant", "NS= non-significant", "HS= high significant"

This table depicts there were a high significant association between neonatal age and causes of their mortality at p-value <0.01.

**Table (4): Relationship between the causes of neonatal mortality and neonatal Gender**

| Causes of Neonatal Deaths | **Rating** | **Gender** | | **Total** | **d.f** | | |
|---|---|---|---|---|---|---|---|
| | | **Male** | **Female** | | | | |
| | Congenital emphysema | 35 | 30 | 65 | 16 | obs.= 26.482<br>crit.= 26.296<br>P-value=0.048 | S |
| | Sepsis | 42 | 42 | 84 | | | |
| | Weight loss and age | 22 | 10 | 32 | | | |
| | Congenital Anomalies | 15 | 22 | 37 | | | |
| | Respiratory distress syndrome | 102 | 56 | 158 | | | |
| | Jaundice | 0 | 3 | 3 | | | |
| | Birth Defect | 1 | 0 | 1 | | | |
| | Inhalation of uterine fluids | 1 | 0 | 1 | | | |
| | Renal Failure | 1 | 0 | 1 | | | |
| | Acute Weight Lose | 0 | 1 | 1 | | | |
| | Pneumonia | 3 | 0 | 3 | | | |
| | Heart abnormalities | 1 | 2 | 3 | | | |
| | Brain Malformation | 7 | 2 | 9 | | | |
| | Brian Hypoxia | 0 | 1 | 1 | | | |
| | Congenital malformations of the respiratory | 3 | 2 | 5 | | | |
| | Platelet inflammation | 1 | 0 | 1 | | | |
| | Underweight with low gestational age | 1 | 0 | 1 | | | |
| | Total | 235 | 171 | 406 | | | |

" Chi-square observer, Chi-square critical, Df= Degree of freedom, "P-value= Probability value", "S= significant", "NS= non-significant", "HS= high significant"

This table depicts there were a significant association between neonatal gender and causes of their mortality at p-value <0.05.

**Table (5): Relationship between the causes of neonatal mortality and neonatal Birth Weight**

| | Rating | Birth Weight | | | | | | Total | D.f | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | <900 | 1000-2000 | 2100-3100 | 3200-4200 | 4300-5300 | >5400 | | | | |
| Causes of Neonatal Deaths | Congenital emphysema | 12 | 37 | 15 | 0 | 1 | 0 | 65 | 80 | obs.= 26.482<br>crit.= 101.879<br>P-value=0.064 | NS |
| | Sepsis | 7 | 37 | 31 | 9 | 0 | 0 | 84 | | | |
| | Weight loss and age | 2 | 14 | 14 | 2 | 0 | 0 | 32 | | | |
| | Congenital Anomalies | 5 | 20 | 10 | 2 | 0 | 0 | 37 | | | |
| | Respiratory distress syndrome | 12 | 69 | 58 | 18 | 1 | 0 | 158 | | | |
| | Jaundice | 0 | 1 | 2 | 0 | 0 | 0 | 3 | | | |
| | Birth Defect | 1 | 0 | 0 | 0 | 0 | 0 | 1 | | | |
| | Inhalation of uterine fluids | 0 | 1 | 0 | 0 | 0 | 0 | 1 | | | |
| | Renal Failure | 0 | 1 | 0 | 0 | 0 | 0 | 1 | | | |
| | Acute Weight Lose | 0 | 1 | 0 | 0 | 0 | 0 | 1 | | | |
| | Pneumonia | 0 | 3 | 0 | 0 | 0 | 0 | 3 | | | |
| | Heart abnormalities | 0 | 1 | 2 | 0 | 0 | 0 | 3 | | | |
| | Brain Malformation | 0 | 2 | 5 | 1 | 0 | 1 | 9 | | | |
| | Brian Hypoxia | 0 | 1 | 0 | 0 | 0 | 0 | 1 | | | |
| | Congenital malformations of the respiratory | 0 | 1 | 4 | 0 | 0 | 0 | 5 | | | |
| | Platelet inflammation | 0 | 0 | 1 | 0 | 0 | 0 | 1 | | | |
| | Underweight with low gestational age | 0 | 1 | 0 | 0 | 0 | 0 | 1 | | | |
| | Total | 39 | 190 | 142 | 32 | 2 | 1 | 406 | | | |

" Chi-square observer, Chi-square critical, Df= Degree of freedom, "P-value= Probability value", "S= significant", "NS= non-significant", "HS= high significant"

This table depicts there were a non significant association between neonatal wieght and causes of their mortality at p-value >0.05.

## Discussion

The risk of neonate mortality peaks in the recent birth period, in the first 28 days of life. Therefore, it is essential to ensure the safety of childbirth and to provide effective care for newborns in order to prevent such deaths. It is noteworthy that about 44% of the deaths of children under the age of five occur during the recent birth. The findings of this study depicts that the a male gender neonate death aged less than five days weighted

1000-2000 kg. This results came in the same line with study conducted in Babylon governorate deals with causes of neonatal mortality.

Our findings depicts the respiratory distress syndrome were records the majority among causes of neonatal death. This results come in the same line with study conducted in Babylon Governorate as a (41.6%) of neonate die by the respiratory distress syndrome as considered the greatest causes of neonate mortality[16].

In Thi-Qar, Iraq studied reasons of newborn deaths in NICU, concluded that the most common reasons of neonatal mortality were RDS[20].

A descriptive-across sectional analytical and retrospective study and the population of the study involved whole babies hospitalized in NCU and neonatal intensive care unit of Sari Bu Ali Hospital. Entitled "A Study of Frequency and Causes of Neonatal Mortality", conducted by Zafari and others at (2012). He founds that there was "not significant relationship" between age at mortality and baby death, results consistent with the current study findings[21].

While the retrospective study which inconsistent with the present finding, conducted by (Azize et.al.,2017) at Sulaimani's Maternity Teaching Hospital, achieved in the NICU to investigate the effects of various danger factors such as (newborn gender, expected date of delivery, childbirth weight, mother's age and reasons of mortality. Found that there was no statistically "significant relationship" between neonatal cause and newborn weight because of p-value (> 0.05)[25].

## Conclusions

A less than five days of life male neonate weighted 1000-2000 kg die by respiratory distress syndrome affected by age and their gender. Health care providers need to be trained on neonatal resuscitation. All nurses and doctors involved in obstetrics and neonatal care should be trained in at least immediate care of the newborn.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

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# Nurses Knowledge Assessment Concerning Prevention of Ventilator-Associated Pneumonia

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## Abstract

(VAP) is defined as pneumonia that develops in mechanically ventilated patients after 48 hours or more of mechanical ventilator support, VAP increases the mortality and morbidity rates of patients and healthcare costs, This study was a descriptive cross-sectional survey. Sample a total sample of 126 nurses was collected for the current study,setting and Participants a convenience sample of graduate nurses was obtained from eight hospitals throughout Babylon. The study was approved by the ethics committees of the Babylon health department and the participating, Researcher used standard a questionnaire that integrated the assessment of nurse's knowledge for prevention of VAP from the Center of Disease Control and Prevention questionnaire was validated by a panel of four specialists in the disciplines of nursing, The questionnaire was administered to the participants in their hospitals by the principle investigator. Nurses were informed that their completion of the questionnaire would be considered as consent to participate.SPSS version 22 was used for data analysis, The study conclude that the mean age of participants in the study was young and female, the majority of the nurses didn't know that the mechanical ventilator humidifier must be changed weekly to prevent VAP. Researcher encourage all Iraqihospitals ICUs nurses to involve inclinical training to improve nurses acquisition and to evaluate the content of the nursing curricula to identify shortcomings in content. It is imperative that VAP-prevention guidelines be integrated in training and teaching within the nursing schools, and that the content and teaching strategies of infection control courses are updated.

***Key words:*** *Nurses knowledge, Ventilator-Associated Pneumonia.*

## Introduction

The Institute for Healthcare Improvement and the American Thoracic Society have developed evidence-based guidelines to prevent Ventilator Associated Pneumonia (VAP) which is a common nosocomial infection that is associated with increased length of hospitalization, VAP affects 10%-25% of patients who are treated in intensive care units for more than two days, Therate of VAP varies between countries, with higher prevalence and mortality rate reported in developing countries [1] (VAP) is defined as pneumonia that develops in mechanically ventilated patients after 48 hours or more of mechanical ventilator support, VAP increases the mortality and morbidity ratesof patients and healthcare costs Mechanically ventilated patients are at high risk for developing VAP owing to diverse reasons such as the presence of an endotracheal tube, altered sensorium oral inflammation, impaired mucociliary clearance, inhibition of cough response and micro aspiration of secretions [2]. In 2007, the Institute for Healthcare Improvement (IHI) created the Triple Aim, Which focused on "improving the experience of care providers, improving the health of populations and reducing per capita cost of healthcare." Since that time, healthcare systems across the country have ramped up efforts to reduce the incidence of hospital-acquired conditions (HAC), which account for some readmissions, declining health, and rising costs. To some degree, those efforts are paying off. The Department of Health and Human Services (HHS) reported approximately 87,000 fewer

inpatient deaths and a 17% decline in hospital-acquired conditions from 2010 to 2014, resulting in a reduction of almost $40 billion in healthcare costs [3]

VAP is account for the highest burden of nosocomial infection as well of health care which is of a serious concern today. It has been reported that the incidence of a nosocomial infections in intensive care unit is about 2 to 5 times higher than in the general in-– patient hospital [4]. A systematic literature review and meta-analysis undertaken the use of antiseptics lowers the risk of VAP, though it does not contribute to the reduction in mortality and duration of ICU stay. [2] The positive effect of preventive measures may decrease with length of time at risk. Moreover, continuous aspiration of subglottic secretions has a favorable effect on the incidence of early onset VAP, but the effects on late-onset VAP are less definite. [5] . Tracheal suctioning is one of the most common invasive procedures performed by nurses on ICU patients and is crucial to reducing the risk of VAP; Tracheal suctioning is traditionally performed using the open suction system which involves disconnecting the patient from the ventilator and introducing a single-use suction catheterconsists of a multi-use suction catheter included within the ventilation circuit, preventing the need for disconnection and the resultant loss of airway pressure. [6]

Knowledge about VAP prevention varied widely among physicians and nurses. Knowledge gaps affect the implementation and monitoring of VAP prevention practices. Continuing education remains imperative, Knowledge of guidelines for prevention of VAP among healthcare workers (HCWs) has been infrequently assessed and mainly in staff nurses only. The gaps between individual knowledge of VAP prevention and actual daily clinical practice have not been compared. [7]

Prevention of VAP is much more cost-effective than treatment which is an essential objective of health care delivery within ICUs. Care bundle protocols are different and controversial in different hospitals, Preventing infections is the daily work of nurses in every hospital. This applies to the critical unit as well where nurses are the forefront of infection prevention either VAP or other. They create and provide the safe environment, take responsibility for nursing care and play a pivotal role in preventing nosocomial infections. American Organization of Nurse Executives (2015) clinical operations, care management, quality and safety, the patient experience, performance improvement and workforce planning. In addition this role has business and financial expertise. The role of the system chief nurse executive (CNE

**Expected Nursing Practice**

Collaborate to identify patients where implementation of noninvasive positive pressure ventilation (NIPPV) may be appropriate to prevent the need for intubation

Assess readiness to extubate daily through combined spontaneous awakening trials (SATs: sedation interruption/minimization) and spontaneous breathing trials (SBTs), unless clinically contraindicated

Maintain and improve physical conditioning through early exercise and mobility

Elevate the head of bed (HOB) to 30º to 45º unless clinically contraindicated in patients receiving mechanical ventilation, as well as patients at high risk for aspiration

Minimize pooling of secretions above the endo-tracheal tube cuff by using an endotracheal tube with subglottic suction capability in patients with anticipated intubation greater than 48 to 72 hours Change ventilator circuits only if visibly soiled; do not change ventilator circuits routinely. [9]

## Methodology

Design: This study was a descriptive cross-sectional survey. Sample a total sample of 126 nurses was collected for the current study, the sample size determined by the Rawsoft sample size calculator. Based on an estimated response rate of 50%, ά =0.05, power =0.95; the estimated population of nurses in Iraq/ Babylon is 200, so the required sample size is estimated to be 120. The current study used a larger sample to enhance the results' external validity.Inclusion Criteria -Undergraduate nursingschool,setting and Participants a convenience sample of graduate nurses was obtained from eighthospitals throughout Babylon. The study was approved by the ethics committees of the Babylon health department and the participating.

Researcher used standard a questionnaire that integrated the assessment of nurse's knowledge for prevention of VAP from the Center of Disease Control and Prevention questionnaire was validated by a panel of four specialists in the disciplines of nursing and infection control. The questionnaire comprised two parts. Part one included demographic items such as gender and geographic, Part two comprised 20 multiple-choice questions, each containing four choices: the correct answer and three distracters. The four choices included "I don't know" as an option to prevent guessing. For scoring purposes, the questions were graded as 1 for the correct answer and 0 for other responses. Individual totals for the 20 could thus range from 0 to 20, a higher score indicating a better knowledge level and a score below 10 meaning that the nurses failed the test.(Aloush & Qadire, 2017)

**Data collection procedure:**

The questionnaire was administered to the participants in their hospitals by the principle investigator. Nurses were informed that their completion of the questionnaire would be considered as consent to participate. Nurses were assured that participation is completely voluntary and that their responses in the questionnaire were confidential. The nurses also were informed that they had the right to withdraw from the study any time. The nurses were subject for any emotional, physical or mental harm as a result of participation in the study. Data were collected in the period April -August 2018.

## Statistical Analysis

SPSS version 22 was used for data analysis. The mean scores and frequencies were calculated. An independent sample t-test was used to measure the difference in mean scores between male and female participants and between nurses with previous education in their training courses about VAP management and mechanical ventilators and those without. An ANOVA test was conducted and the difference in mean scores was compared among nurses according to the geographical location of the hospital.

## Results of the Study

Researcher distributed 140 questionnaires, of which only 126 were completed, a total response rate of 98%. Respondents were of different geographical locations and gender. Participating hospitals were of government affiliation. The mean age of participants in the study was 24.6 (SD=2.9) for females and 23.7 (SD=2.7) for males. (Table 1)

**Table 1. Nurses' characteristics**

| **Items** | | **Frequency** | **%** |
|---|---|---|---|
| 1 | Gender<br>Female:<br>Male: | <br>66<br>60 | <br>52<br>48 |
| 2 | Hospitals location<br>Center of Babylon:<br>Peripheral ofBabylon: | <br>78<br>48 | <br>61.9<br>38.1 |
| 3 | Received educational program and training on Mechanical ventilator in their undergraduate courses.<br>Yes:<br>No: | <br>64<br>62 | <br>50.8<br>49.2 |
| 4 | Received educational program and training on Ventilator Associated Pneumonia (VAP) management in their undergraduate courses<br>Yes:<br>No: | <br>65<br>61 | <br>51.6<br>48.4 |

**Table 2.Preferred guidelines and frequencies of correct answers Preferred:**

| | **Preferred guidelines and frequencies of correct answers:** | **n(%)/ n=126** |
|---|---|---|
| 1 | Which method of endotracheal tube insertion is preferred to decrease VAP? | 54(42.8%) |
| 2 | How often is it preferred the ventilator circuits be changed to decrease the risk VAP? | 61(48.4%) |
| 3 | Which type of humidifiers is preferred to decrease the risk of VAP? | 75(59.5%) |
| 5 | How often is it preferred the humidifier be changed to decrease the risk VAP? | 68(53.9%) |
| 6 | Which type of suctioning systems is preferred to decrease the risk VAP? (open vs close) | 45(35.7%) |
| 7 | How often is it preferred the suction systems be changed to decrease the risk VAP? | 69(54.7%) |
| 8 | Which type of endotracheal tube is preferred to decrease the risk of VAP? | 71(56.3%) |
| 9 | Which type of bed is preferred to decrease VAP the kinetic bed vs the standard bed? | 44(34.9%) |
| 10 | Which patient position is preferred to decrease the risk VAP? | 65(51.6%) |
| 11 | Which solution is preferred for oral care to decrease the risk VAP? | 61(48.4%) |
| 12 | How often oral care is preferred to decrease the risk VAP? | 47(37.3%) |
| 13 | How often is it preferred to assess patient readiness for extubation? | 75(59.5%) |
| 14 | How often is it preferred to perform spontaneous breathing trial with sedatives turned off? | 68(53.9%) |
| 15 | When is it preferred to wash hand to decrease the risk of VAP? | 45(35.7%) |
| 16 | When is it preferred to wear gloves to decrease the risk of VAP? | 69(54.7%) |
| 17 | At which level endotracheal tube cuff pressure should be kept to decrease the risk of VAP? | 71(56.3%) |
| 18 | To decrease the risk of VAP, which of the following practices related to antibiotics use is preferred? | 44(34.9%) |
| 19 | What is effect of giving peptic ulcer prophylactic (e.g. H2 blockers, Proton pump inhibitors, or sucral fate) administration on the risk of VAP? | 65(51.6%) |
| 20 | What is the effect of Deep Venous Thrombosis (DVT) prophylaxis on the risk of VAP? | 61(48.4%) |

The mean knowledge score for participants was 6.4 (32%) (SD=2.9), with a range of 16 (80%) to 0(0%).63 nurses (14.5%) answered more than half of the questions correctly. Weakness in the knowledge related to mechanical ventilator management was obvious. The majority of the nurses didn't know that the mechanical ventilator humidifier must be changed weekly to prevent VAP, the endotracheal tube's cuff pressure must be kept at the level of 20-30 H2O, and that the ventilator circuit must be changed only when it is visibly soiled or for every new patient's admission. Another topic of concern was oral care and suction. On the other hand, students showed a reasonable level of knowledge regarding hand washing and patients' positioning. (Table 2).

**Table3. Nurses' scores vs. baseline characteristics**

| | | Nurses Scores out of 20 | | |
|---|---|---|---|---|
| **Items** | | **Mean (SD)** | **t** | **p** |
| 1 | Gender<br>Female:<br>Male: | 6.42(2.8)*<br>6.44(2.9) | 0.2 | 0.93 |
| 3 | Received educational program and training on Mechanical ventilator in their undergraduate courses.<br>Yes:<br>No: | 6.9(2.8) 5.9(2.9) | 2.1 | 0.00 |
| 4 | Received educational program and training on Ventilator Associated Pneumonia (VAP) management in their undergraduate courses<br>Yes:<br>No: | 6.4(2.9) 6.6(2.9) | 1.9 | 0.014 |

There was a statistically significant difference in knowledge scores between nurses who had received education in VAP on their undergraduate courses and those who had not: t (432) =-3.5, p=0.00. However, both groups revealed poor knowledge, The former achieved higher scores (M = 6.9, SD =2.8) than the latter (M =5.9, SD =2.9 ). There was no statistically significant difference in the scores of male and female nurse, and no statistically significant difference between nurses who had been taught about mechanical ventilators and those others who had not (p >.05) (Table 3).

## Discussion

Participants had a poor knowledge of VAP-prevention can be compared with other nurses that showed poor overall knowledge about infection control guidelines among student nurses in India, Iran and Spain however, my study was more comprehensive as it focus only on VAP prevention guidelines also it provided a broader set of updated VAP prevention guidelines . Mechanical ventilator management, oral care and the endotracheal tube suction items were the major topics of concern among our nurses, again similar to the findings from another study with student nurses in Spain and with newly graduated nurses in United States. On the other hand, participants showed much better knowledge about hand hygiene and the Semi-Fowler position than about other topics, although their performance was still unsatisfactory.

## Conclusions

The study conclude that the mean age of participants in the study was young and female,the majority of the nurses didn't know that the mechanical ventilator humidifier must be changed weekly to prevent VAP,There was a statistically significant difference in knowledge scores between nurses who had received education in VAP on their undergraduate courses and those who had not. Researcher encourage all Iraqihospitals ICUs nurses to involve inclinical training to improve nurses acquisition and to evaluate the content of the nursing curricula to identify shortcomings in content. It is imperative that VAP-prevention guidelines be integrated in training and teaching within the nursing schools, and that the content and teaching strategies of infection control courses are updated. The findings from this study may be used as a reference to evaluate the effectiveness of educational interventions in the future

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

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# Maternal Nutritional Status and Preterm Birth

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## Abstract

An optimal diet before and during pregnancy cannot *guarantee* a successful outcome of pregnancy; it can improve the chance of a healthy newborn baby, a healthy mom, and a healthy future for both. A woman who is well nourished and within her healthy weight range prior to conception provides an environment conducive to normal fetal growth and development during the critical first trimester of pregnancy. Study design and population. This study used data from the mothers and child care unit in health centers, a prospective cohort study in central Al.Hillah designed to investigate the maternal dietary patterns during the second trimester and risk factors for preterm birth. second trimester of pregnant women were recruited at 24–29 wk of gestation from prenatal clinics at the MCH Services Department.

Stratified and randomly selected out-patient clinics between Jan 2016 and April 2017. All participants gave written informed consent at the time of recruitment. Data were collected via interviews and self-administered questionnaires, including an MNA to collect dietary information. Socio-demographic information and health behaviors were collected via interviews. during the first 6 mo of pregnancy was collected from self-administered questionnaires. pregnancy BMI was based on height measured at the first prenatal clinic visit and self-reported pregnancy weight. Missing pregnancy weight was imputed on the basis of the first prenatal care visit (19). Total of (50) pregnant women were enrolled into the PIN study. Only pregnancies with complete dietary information were included in this study (n = 50).

Data analyses the related data by using SPSS 23.0 software program. A level of $P < 0.05$ was considered statistically significant. Characteristics of the intervention group and comparison group were compared using t-tests for continuous variables and $\chi 2$-tests for categorical variables. Most of the sample (44.9%) had (21-26) years aged,(36.7%) with (56-66 kg ) body weight and (42.9% ) had 140-150 cm ) body height

***Key words:*** *nutritional status, preterm birth, status*

## Introduction

An optimal diet before and during pregnancy cannot *guarantee* a successful outcome of pregnancy; it can improve the chance of a healthy newborn baby, a healthy mom, and a healthy future for both [1] . A woman who is well nourished and within her healthy weight range prior to conception provides an environment conducive to normal fetal growth and development during the critical first trimester of pregnancy. Recent studies suggest that nutritional deficiencies during this period increase the risk of certain chronic diseases later in the infant's life [1] . During pregnancy, the fetus cannot meet its genetic potential for development if the supply of energy and nutrients is inadequate. For the mother, adequate but not excessive weight gain reduces the risk of complications during pregnancy and delivery and lowers the risk of postpartum weight retention. An optimal diet provides enough, but not too many, calories and nutrients to optimize maternal and fetal health [1] . The maternal diet during pregnancy must provide sufficient energy to ensure the delivery of a full-term, healthy infant of adequate size and appropriate body composition. Ideally, a woman should enter pregnancy with a healthy weight and good nutritional status. The total protein requirement during pregnancy has been estimated to be approximately 925 g for a woman gaining 12.5 kg and delivering an infant of 3.3 kg. Protein is not gained at a constant rate, the rate at which

protein is deposited increases as pregnancy progresses. Estimates for the first, second, third and fourth quarters are 0.64, 1.84, 4.76 and 6.10 g of protein per day. The DRV panel did not give any specific values for additional fat requirements during pregnancy However, pregnant women and those planning a pregnancy need an adequate dietary intake of essential fatty acids and their longer-chain derivatives, DHA and AA which are necessary for the development of the brain and nervous system of the fetus, particularly in late pregnancy [2] . The best dietary source of long-chain n-3 fatty acids (EPA and DHA) is oil-rich fish. Carbohydrate Requirements for starch, sugar and non-starch polysaccharides (dietary fiber) during pregnancy are not increased. However, constipation, which may be party attributed to reduced motility of the gastrointestinal tract, is common at all stages of pregnancy. Women with low intakes of non-starch polysaccharides may benefit from increased intakes, to within a range of 12–24 g per day, along with increased fluid intakes to encourage regular bowel movement. The DRV panel established DRVs for nine vitamins, with increments during pregnancy for vitamins A, C and D, thiamin, riboflavin and folate. The DRV panel established DRVs for 10 minerals however; no increments were established for pregnancy as requirements are not considered to increase [2] . This is mainly because of the more efficient absorption and utilization of nutrients that occurs during pregnancy such as Calcium, The RNI for calcium for all adults is 700 mg per day and the DRV panel did not consider that any increment was necessary during pregnancy and Iron requirements are increased during pregnancy to supply the growing fetus and placenta and for the production of increased numbers of maternal red blood cells [2]. Preterm birth is one of the leading causes of neonatal morbidity accounting for nearly 35% of all neonatal deaths in the United States . Despite decades of research, the incidence of preterm birth remains close to 11% and the etiology is largely unknown. With regard to diet, maternal nutrition during pregnancy has an important role in providing the necessary nutrients for fetal growth; however, the relation between maternal dietand preterm birth is not well established. The failure to identify individually strong, modifiable causes of preterm birth is not due to insufficient research given numerous studies focused on psychosocial stress and health behaviors, particularly tobacco, alcohol, and illicit drugs . A number of suggestive associations have been reported for maternal pregnancy weight, gestational weight gain, diet, stress,depression, cocaine use, and physical activity, but because of the challenge in accurately assessing such factors, most studies collect detailed data or analyze only one realm at a time [4]. Recent global estimates suggest that more than 1 in 10 or an estimated 15 million babies born in 2010 were pre-term, of which more than 1 million died as a result of preterm birth and related complications . Although neonatal mortality rates have fallen globally between1990 and 2009 , the absolute numbers and rates of preterm birth have increased during this period. Pre-term birth complications account for 35% of the estimated 3.1 million global neonatal deaths,and are thesecond leading cause of death in children under 5 yearsof age [5].

## Method

Study design and population. This study used data from the mothers and child care unit in health centers, a prospective cohort study in central Al.Hillah designed to investigate the maternal dietary patterns during the second trimester and risk factors for preterm birth, Second trimester of pregnant women were recruited at 24–29 wk of gestation from prenatal clinics at the MCH Services Department. Stratified and randomly selected from health centers between Jan 2019 and April 2019. And purposive sample of mothers from each heath center, All participants gave written informed consent at the time of recruitment. Data were collected via interviews and self-administered questionnaires, including an MNA to collect dietary information. Socio-demographicinformation and health behaviors were collected via interviews. during the first 6 mo of pregnancy was collected from self-administered questionnaires. pregnancy BMI was based on height measured at thefirst prenatal clinic visit and self-reported pregnancy weight. Missing pregnancy weight was imputed on the basis of the first prenatal care visit (19). Total of (50) pregnant women were enrolled into the PIN study. Only pregnancies with complete dietary information were included in this study (n = 50). Dataanalyses the related data by using SPSS23.0 software program. A level of $P < 0.05$ was considered statistically significant. Characteristics of the intervention group and comparison group were compared using t-tests for continuous variables and $\chi 2$-tests for categorical variables.

## Results

**Table (1) indicates the demographics data about the samples.**

| **Age** | **Frequency** | **Percent** |
|---|---|---|
| 15-20 years | 10 | 4.1 |
| 21-26 years | 48 | 19.6 |
| **27-32 years** | **123** | **50.2** |
| 33 and more | 64 | 26.1 |
| Total | 245 | 100.0 |
| | | |
| **Weight** | **Frequency** | **Percent** |
| 45-55 kg | 40 | 16.3 |
| **56-66 kg** | **90** | **36.7** |
| 67-77 kg | 65 | 26.5 |
| 78-88 kg | 50 | 20.5 |
| Total | 245 | 100.0 |
| | | |
| **Height** | **Frequency** | **Percent** |
| **140-150 cm** | **105** | **42.9** |
| **151-161 cm** | **105** | **42.9** |
| 162-172 cm | 35 | 14.2 |
| Total | 245 | 100.0 |

Half the sample had (**27-32**) years aged,(36.7%) with (56-66 kg ) body weight and (42.9% ) had 140-150 cm or 151-161cm ) body height.

**Table (2) shows the BMI of the pregnant mothers**

| **BMI** | **Frequency** | **Percent** |
|---|---|---|
| Under weight | 30 | 12.2 |
| Normal | 120 | 49.0 |
| Overweight | 65 | 26.5 |
| Obese | 30 | 12.2 |
| Total | 245 | 100.0 |

This table showed the half of mothers(49.0%) had normal BMI.

**Table (3) identify the pregnant mothers nutritional status**

| **Nutritional status** | **Frequency** | **Percent** |
|---|---|---|
| Under weight | 80 | 32.7 |
| Normal | 90 | 36.7 |
| Overweight | 75 | 30.6 |
| Total | 245 | 100.0 |

This table showed the nutritional status, (36.7%)of pregnant mothers which had normal nutritional status.

## Discussion

Nutritional status for pregnant women has important starring role to produce preterm birthfor that reason they need to study nutritional status in prediction preterm birth. This study contacted atthe Creative Commons Attribution License (CCAL) (2015) by Maria Lorella Giannì . This finding probably reflects the time needed for the late preterm infants to develop adequate feeding skills, as indicated by the longer hospital stay of the late preterm infants requiring nutritional support compared with that of the late preterm infants who did not received any nutritional support. Another point of view by the property of RCN Publishing Company (2014) by Englund-Ogge L eta l(2014) A team of researchers in Sweden used a study of pregnant women in Norway to analyze births among 66,000 women between 2002 and 2008. Participants had completed a questionnaire on dietary habits during the first four to five months of pregnancy. Show that Among the 66,000 pregnant women, preterm delivery occurred in 3,505 (5.3%) cases The analysis showed that high scores on the prudent dietary pattern were associated with a significantly reduced risk of preterm delivery (hazard ratio 0.88, 95% confidence interval 0.80 to 0.97), as well as a reduced risk of spontaneous and late preterm delivery. Paola Roggero and et al (2015) stated that only infants who did not develop co-morbidities, birth weight ≤2000 g, GA of 34 weeks and possibly were being born SGA were independently associated with a higher risk of having

nutritional support during hospital stay. In addition, when including in the analysis the infants who have developed co-morbidities, not only birth weight ≤2000 g, GA of 34 weeks and being born SGA, but also having developed a respiratory distress syndrome and having required a surgical intervention resulted to be independently associated with a higher risk of receiving nutritional support. Indeed, out of the infants requiring. A nutritional support in the present study, 58 % and 25 % presented co-morbidity and were born SGA, respectively. Being born SGA is actually a recognized risk factor for very preterm infants for having a prolonged transition period from the beginning of oral feeding to full oral feeding. Chantel L Martin and et al (2015)mentionedthat following a dietary pattern that promotes inflammation may increase the possibility of preterm birth by limiting the transfer of nutrients for adequate fetal growth. Furthermore, we postulate that women with greater Adherence to the DASH diet, which was associated with higher amounts of folate, fiber, and vitamin A from foods such as fruits and vegetables, reduces the risk of preterm birth by reducing inflammation and promoting fetal growth, identified some nutrients and foods that could explain a biological mechanism for preterm birth.Infant mortality (deaths/1,000 live births) - 2015 estimatesin Iraq 37.41, Afghanistan 115.08 is the highest mortality and Monaco 1.82 is the lowest. The result of this study indicate that infant mortality rate is high in Iraq but not for reason of nutritional status of female

## Conclusion

The study concluded that most of new mothers in Babylon had no evidence for preterm infant because they had normal nutritional status for that reason Iraq has acceptable infant mortality rate (37.41/1000).

## Recommendation

The study recommended that a nutritional educational program should be conducted in the female secondary schools to maintain healthy nutritional status. And increase the awareness of exercises and activity in the secondary schools.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Babylon Health directorate and all experiments were carried out in accordance with approved guidelines.

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# Immunological Aspects of Patients Infested with Scabies in Thi-Qar Province, Southern Iraq

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## Abstract

Scabies is skin disease of human and many mammalian hosts caused by the important obligate parasites *Sarcoptes scabiei*, lives and reproduces in epidermis ,resulting a significant human and animal morbidity.

The current study aimed to determine the immunological responses in patients infested with scabies who attended a private clinic in Al-Hussein general hospital in Thi-Qar province. The total white blood cell count, differential counts (lymphocytes, monocytes, neutrophils, eosinophils and basophils), the serum levels of IL-5 and IL-13 in were evaluated in all patients with scabies and compared with non-infested healthy individuals as a control group.

The present study showed significant increase on the mean of total WBC in patients infested with scabies when compared with control ($P \leq 0.05$).

A significant differences ($P \leq 0.05$) were recorded in the absolute leukocytes counts for patient infested with scabies when compared with control group except that for monocytes and basophils which were non-significant ($P \leq 0.05$) in our study.

The results of study showed significant differences ($P \leq 0.05$) in the mean of IL-5 and IL-13 serum levels for the patient infested with scabies when compared with control.

***Keywords:*** *Scabies, WBC, IL-5, IL-13, Thi-Qar province, Iraq*

## Introduction

Scabies is skin disease of human and many mammalian hosts caused by the obligate ectoparasites *Sarcoptes scabiei* lives and reproduces in the epidermis that may lead to significant human and animal morbidity [1] .

Adult female of the mites reside in burrows within the stratum granulosum of the epidermis and caused many clinical manifestations appear after 4-8 weeks like itching, irritation, redness for the skin, and hypersensitivity reactions. The clinical rash and itch present as papules or vesicles that may contain individual mites, eggs, egg cases, mite fecal pellets, and debris present in the burrow [2] .

The sources of irritation are feeding activity of mite and host immune system response to its secretions and fecal matter that lead to scratching, scabbing, and subsequent secondary infections [3]. The infection with this ectoparasite caused stimulation humeral and cellular immune system of host [4].

The circulating antibodies in the skin and the cell-mediated immune reaction play a role in clearing of the mites and their eggs and debris.

The intensity of inflammatory response varied with combinations of histiocytes, lymphocytes, and polymorphonuclear leukocytes [2] .

The current study aimed to determine the immunological responses in patients infested with

scabies. The total white blood cell count, differential counts (lymphocytes, monocytes, neutrophils, eosinophils and basophils), the serum levels of IL-5 and IL-13 were evaluated in sixty patients with scabies with no secondary infection or other parasitic infestations and compared with sixty non-infested healthy individuals as control group.

## Materials & Method

The current study involved 60 patients with scabies had a clinical and microscopically feature of the disease, they attended a private clinic in Al-Hussein general hospital in Thi-Qar province during three months from July to september 2019. The epidermis over the suspected site of scabies infestation was scraped off and the skin scraping performed by placing a drop of microscope immersion oil. The specimen placed on a microscope slide and examined by light microscopy for the demonstration of mites or eggs . Sixty healthy persons were selected as control, with exclusion of any patient in both groups who gave a history of drug ingestion for the last two months.

Five ml of venous blood were collected from each scabies patients and control group, the blood sample divided into two parts, the first part was collected in tubes with ethylene diamine tetra acetic acid (2 ml) to estimate total white blood cell count (WBC) and differential leukocyte count. The second part (3 ml) were allowed to clot, then centrifuged to separate the serum which stored at -20 °C to be used for immunological investigations [5] .

The statistical package for social science (SPSS) version used in the current study to analyze data and the results expressed as (Mean ± S.E.). Independent sample T- test used to determine the statistical differences by consideration P-value ≤ 0.05 was statistically significant.

## Results

Results of this study showed significant increase ( P≤ 0.05) in the mean of total WBC for patients infested with scabies 11.95 ± 0 .18 ($10^3$/ml) when compared with control 5.91 ± 0.29 ($10^3$/ml).

The absolute leukocytes counts for patient infested with scabies recorded in current study: Lymphocytes 33.90 ± 1.31 (cell/$mm^3$), monocytes 2.10 ± 0.26 (cell/$mm^3$), neutrophils 71.95 ± 0.46 (cell/$mm^3$), eosinophils 0.41±0.21 (cell/$mm^3$) and basophils 0.096±0.03 (cell/$mm^3$), while for control group: Lymphocytes 20.00 ± 0.27 (cell/$mm^3$), monocytes 2.20 ± 0. .22 (cell/$mm^3$), neutrophils 59.00 ± 0.70 (cell/$mm^3$), eosinophils 1.90 ± 0.16 (cell/$mm^3$) and basophils 0.40 ± 0.11 (cell/$mm^3$).

A significant differences (P≤ 0.05) were recorded in the absolute leukocytes counts for patient infested with scabies when compared with control except that for monocytes and basophils which were non-significant (P≤ 0.05) in present study. Table 1.

**Table 1. Mean ± S.E of total and absolute leukocytes counts for scabies patients and controls.**

| Parameters | Patients No. 60 | Control No. 60 | P-value |
|---|---|---|---|
| WBC (103/ml) | 11.95 ± 0 .18 | 5.91 ± 0.29 | 0.000 |
| Lymphocytes (cell/mm3) | 33.90 ± 1.31 | 20.00 ± 0.27 | 0.000 |
| Monocytes (cell/mm3) | 2.10 ± 0.26 | 2.20 ± 0. .22 | 0.773 |
| Neutrophils (cell/mm3) | 71.95 ± 0.46 | 59.00 ± 0.70 | 0.000 |
| Eosinophils (cell/mm3) | 4.35 ± 0.36 | 1.90 ± 0.16 | 0.000 |
| Basophils (cell/mm3) | 0.25 ± 0.09 | 0.40 ± 0.11 | 0.324 |

Results showing significant differences ( P≤ 0.05 ) in the mean of IL-5 serum levels for the patient infested with scabies 330.05 ± 6.153 (pg/ml) when compared with control 171.92 ± 3.19 (pg/ml).

A significant differences (P≤ 0.05) were noticed in the mean of serum IL-13 levels for the patient infested with scabies 336.94 ± 9.74 (pg/ml) when compared with control 135.29 ± 4.62 (pg/ml). Table 2, Fig. 1 and Fig. 2.

**Table 2: Mean ± S.E of the IL-5 and IL-13 in serum for patients infested with scabies and controls.**

| Parameters | Patients No. 60 | Control No. 60 | P-value |
|---|---|---|---|
| IL 5 (pg/ml) | 330.05 ± 6.153 | 171.92 ± 3.19 | 0.000 |
| IL 13 (pg/ml) | 336.94 ± 9.74 | 135.29 ± 4.62 | 0.000 |

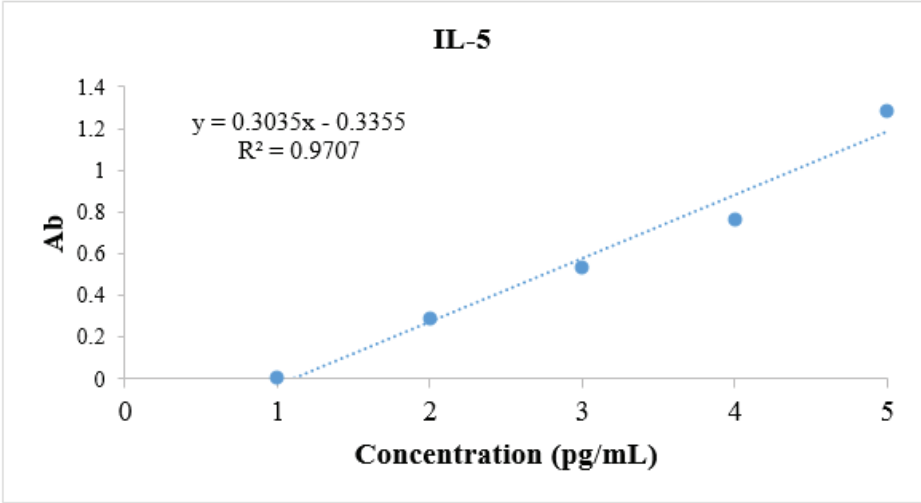


**Fig. 1. Concentrations of IL-5 in patients infested with scabies.**

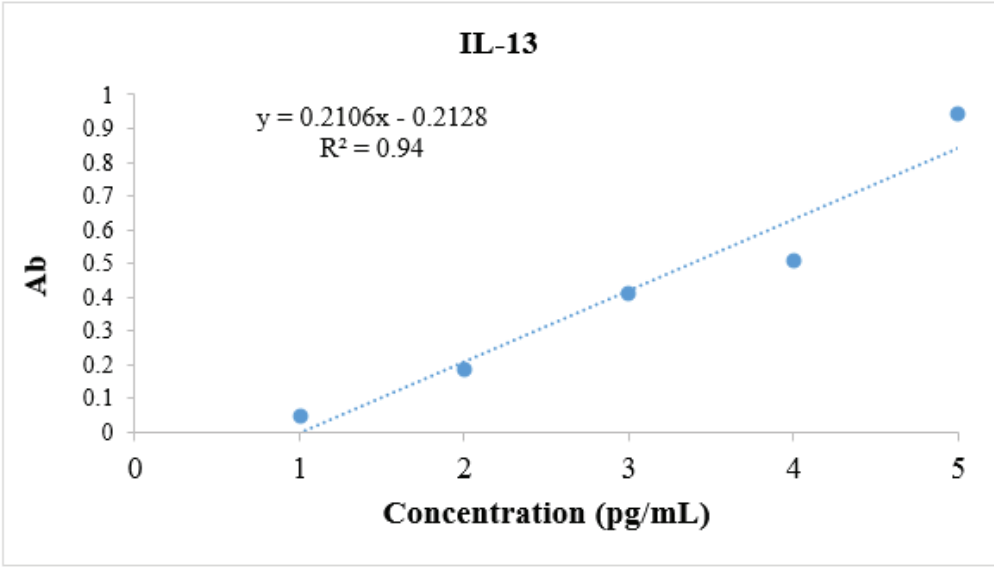


**Fig. 2. Concentrations of IL-13 in patients infested with scabies.**

## Discussions

Scabies is an important public health problem, not only for the individuals concerned, but also for their families and communities [6] . The manifestations of scabies are mediated through inflammatory and allergic-like reactions to mite products, leading to intensely pruritic skin lesions [7] . Both humoral and cellular immune responses against the mite antigens are developed [8] .

The mites hosting under the cuticle can produce soluble antigens via saliva, feces, and other secretions. In addition, various antigens can be released by dead and disintegrated mites. These antigens are probably more important and have greater pathogenic effects inducing immune and inflammatory responses of the human body than live mites. The antigens can spread to the dermis through subcutaneous intercellular fluid and stimulate immune and inflammatory responses [9] .

Results of the current study indicated a significant increasing in the mean of total WBC in patients infested with scabies; these lead to an increase in of lymphocytes, neutrophils, eosinophil and basophils because the infection with this parasite causes stimulation immune system of host humeral and cellular [10] .

Previous studies reported increased in total leucocytes counts in patients infested with scabies as Shelley and Bart [11] and Walton et al [8].

Cadman and Lawrence [12] noticed high numbers of lymphocytes, monocytes, eosinophils and basophils in patients with scabies. The granulocytes are innate effector cells in the host immune defense against many multicellular parasites.

The current study reported significant increase in mean of eosinophil count for scabies patients when compared with control, this observation maybe attributed to allergy disorder which is one of symptoms of *S. scabiei* infection and may be due to cellular respond due to the parasite infestation [8].

The extracts of dead or 1ive mites can influence the number of inflammatory cells in local tissues and blood circulation during immune or inflammatory responses of the host [13-15] .

The current study showed significant increase in the levels inflammatory mediators such as IL-5 and IL-13 in the serum of patient infested with scabies.

Arlian and Morgan [15] showed that the infestation with *S. scabiei* stimulates dermal microvascular endothelial cells to produce various inflammatory mediators, such as IL-1, IL-6 , IL-8 , IL-10 , and TNF-α, these mediators participate in the regulation of inflammatory and immune responses.

Cadman and Lawrence [12] noticed that the eosinophils, mast cells and basophils can be rapidly recruited to sites of infection and draining lymph nodes where they produce IL-4 and/or IL-13.. They acted as responsible for the initiation and ongoing regulation of Th2 responses.

## Conclusion

The results of current study showed that the scabies infestation caused immunological reactions includes both cellular and humoral immune response in patients when compared with control. They had an important role in change of total and differential leukocytes and effect on the levels of inflammatory mediators such as IL-5 and IL-13in patient when compared with control.

**Financial Disclosure**: There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Education for Pure Science and all experiments were carried out in accordance with approved guidelines.

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# Mother's Knowledge of Initiative Breast Feeding in Relation to Neonatal Jaundice

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## Abstract

Jaundice is the greatest common situation that needs medicinal care in neonates, which present as yellow coloration of the skin and sclera related to accumulation of unconjugated bilirubin which was considered a neurotoxic to cause brain death (Kernicterus). The Aim of this study to identify the effect of successful breast feeding on neonatal hyperbillirubinemia. Material & method: Design a descriptive design was conducted through a period of study .The sample & setting: were taken accidentally from (250) mothers who had children under one year from practicing breast feeding from Babel maternity and pediatric hospital. Data collection were collected through structured interview and application of the questionnaire with mothers regarding their early achievement of breast fed their jaundiced .Self-administered instrument which takes about 30 minutes. Data analysis: data analyzed the equal number of mother's age were (43.2%) who were aged (26 - 31) ,with majority (47.2%) of the sample were not educated , therefore that (92.0%) were not working . The researchers recommend educational booklets construction concerning the ten steps of successful breast feeding.

***Keyword:*** *Neonatal Jaundice, Initiative Early Breast Feeding*

## Introduction

Newborn jaundice is the most widespread situation affecting neonatal babies particularly throughout the first week of life. Approximately fifty percent to sixty percent of the neonatal babies become affected with jaundice in the first week of life besides, global, around 14.1 million neonatal babies requirement phototherapy to treat jaundice [(1)] .Moreover, [(2)] mentioned that global, there are approximately 0.5 to 4 percent of term, early term and late preterm children from 135 million yearly live births, before discharge from the nursery obtain phototherapy. Jaundice, a common situation in neonates, refers to the whites of the eyes , and yellow color of the skin that occurs when there is excessively bilirubin in the blood. Bilirubin (bill-uh-ROO-bin) is made by the normal breakdown of red blood cells(RBCs). Normally, it passes through the liver, which releases it into the intestines as bile (a liquid that helps with digestion).[(3)]

Newborn jaundice is the most common problem in full-term babies throughout the immediate post-natal period . Nurses' breastfeeding beliefs, knowledge , and behaviors can significantly affect mothers' breastfeeding success. However, mothers of infants admitted to hospital with jaundice experience feelings of failure, guilt and inadequacy. Maternal confidence is known to be a strong predictor of breastfeeding duration, with absence of confidence in breastfeeding skills leading to a higher likelihood of weaning in the first 6 weeks post-partum [(4)]. The affiliation concerning newborn jaundice and initial breast feeding initiation has acknowledged much consideration, as long as, it is a result of numerous factors which may be maternal or fetal related. Jaundice can be either maternal or fetal related , in most cases treatment is not essential just as continuity on breast feeding. [(1)] .To improve the growth, overall health of children, and nutritional status, the World Health Organization and the United Nations Kids' Fund stimulate a worldwide strategy for baby and young kid feeding, which involve the Baby- Friendly Hospital Initiative and ten steps for successful breast-feeding, which has a important effect on the grade of jaundice, [(4)].

Breastfeeding confers many advantages to infants, mothers, families, and society and is the normal nutrition for the newborn infant. Human milk infant feeding decreases the incidence of infectious diseases and enhances the immunologic status of the newborn , exclusive breastfeeding is therefore recommended for the first six months of life [(4)].

Notwithstanding of "many advantages of breast-feeding, previous medical reports revealed that dehydration, poor body weight gain, and hyperbilirubinemia in breast-fed infants are more common. These problems were often preventable and generally did not result in long-term harm to the infants; however, in recent years, serious consequences, such as hypernatremic dehydration and kernicterus have been reported in exclusively breast-fed infants. The causes may be attributed to inappropriate breast-feeding and to early discharge practices".[(3")]which includes breast-feeding classes, 24-hour rooming-in, and exclusive breast-feeding. In Since many years ago, our hospital has been promoting the Baby- Friendly Hospital Initiative, our experience; many mothers have concerns about breast-feeding, including breast-milk insufficiency, decreased infant urination, poor body weight gain, and jaundice". [(5)]

Baby-Friendly practices are based on the foundation that individual attitudes toward breastfeeding are largely influenced by breastfeeding education during the early prenatal period, positive birth and initial breastfeeding experiences, and continued provider support [(6)].

## Objectives of the Study

The main objective of this research is listed in the following points:

**1)** To determine the mother's knowledge concerning initiative breast feeding .

**2)** To identify the relationship between initiative breast-feeding with neonatal jaundice and such demographic data.

## Methodology

**Design of the study:** Correlation design conducted to study the association between the neonatal jaundice with initiative breast feeding through the period Dec.2017-Feb.2018.

**Sample of the study:** probability (purposive sampling) was selected which consists of" (250) mothers who were admitted to pediatric words at Babylon hospital for maternal and children.

**Setting of the study: the study carried out at Babylon hospital maternal and child.**

The study carried out at Babel maternity and pediatric hospital

**Instruments**: The questionnaire was assembled for the purpose of the study. The Instruments consisted"

**Part 1: Demographic Date Sheet:** This part concerned with personal information include"

**Part 2: items related to Mothers knowledge according to WHO instructions for Initiative Breast Feeding**

**Statistical Analysis:** Data were analyzed using the Statistical Package for Social Sciences" (SPSS) "version 19. Through the application of descriptive statistical data analysis include" (Frequencies and Percentage).

## Results

(43.2%) of mothers age where between 26-31, concerning level of education about (47.2%) where not educated , in regarding type of delivery (52%) from them where normal vaginal delivery, concerning disease 82% have not any chronic disease, according to medication 85% where no, in regarding sex 58% where female, concerning gestational age 84% where less than 37, according to Age newborn 35.2% where between 1-5 days, concerning Weight at birth (46.8) where weight between 2600-3100 gm, in regarding Type of feeding (65.2) where breast feeding. Concerning Child order (41.2) where first child. In regarding to jaundice (76) their children with jaundice, according to Type of management (56.8) where with phototherapy. Initiative successful breast feeding ( 78) where No , according to Initial first feeding within first half an hour( 56) were No. concerning Lactate my baby on demands (63.2) where No, in regarding to Lactate my baby on schedule(63.2) where No. according to Exclusive breastfeeding under 6 month (62.4) where No, concerning Take lessons about importance of breast feeding through pregnancy (63.2)

where No. in regarding to Begin with sugar & water support breast feeding (63.2) where No. concerning Evacuate one side on each time of feeding (66.4) where No. according to Lactate baby from both sides equal time (60.8). concerning Using my nipple areola on sucking (64) where No. in regarding I used to keep may baby on pacifier between breast feeding (55.2) where No, according to -I gave my baby such remedies between Br. Milk (63.2) where No, concerning Remedies used once a day in addition to breast milk (64) where No and in regarding Continue on breast feeding with elevation of bilirubin(62.4) where No.

**Table (1): Association between mothers characteristics as age with Jaundice (N=250)**

| **jaundice Age** | **Yes** | **No** | **Total** | $\chi^2_{obs.}$ | **Df** | $\chi^2_{crit}\chi^2_{crit.}$ |
|---|---|---|---|---|---|---|
| 20-25 | 30 | 5 | 35 | 2.679 | 2 | 5.991 |
| 26-31 | 78 | 30 | 108 | | | |
| 32 and more | 82 | 25 | 107 | | | |
| Total | 190 | 60 | 250 | | | |

p-value = 061

This table reveal that no relationship between mothers age and jaundice at p-value (0.61)

**Table (2): Association between mothers characteristics as level of Education with Jaundice (N=250)**

| **jaundice Education** | **Yes** | **No** | **Total** | $\chi^2_{obs.}$ | **Df** | $\chi^2_{crit}\chi^2_{crit.}$ |
|---|---|---|---|---|---|---|
| Not educated | 82 | 36 | 118 | 5.587 | 2 | 5.991 |
| Educated | 78 | 19 | 97 | | | |
| Well Educated | 30 | 5 | 35 | | | |
| Total | 190 | 60 | 250 | | | |

p-value = 0.61

"This table reveal that no statistical significant relationship between mother's level of education and jaundice at p-value" (0.61)

**Table (3): Association between mothers characteristics as Occupation with Jaundice (N=250)**

| **jaundice Occupation** | **Yes** | **No** | **Total** | $\chi^2_{obs.}$ | **Df** | $\chi^2_{crit}\chi^2_{crit.}$ |
|---|---|---|---|---|---|---|
| Not Working | 175 | 55 | 230 | 0.012 | 1 | 3.841 |
| Working | 15 | 5 | 20 | | | |
| Total | 190 | 60 | 250 | | | |

p-value=0.913

This table reveal that no statistical significant relationship between mother's occupation and jaundice at p-value (0.91)

**Table (4): Association between mothers characteristics as type of delivery with Jaundice (N=250)**

| **jaundice Type of Delivery** | **Yes** | **No** | **Total** | $\chi^2_{obs.}$ | **Df** | $\chi^2_{crit}\chi^2_{crit.}$ |
|---|---|---|---|---|---|---|
| Normal delivery | 95 | 35 | 130 | 012 | 1 | 3.841 |
| CS | 95 | 25 | 120 | | | |
| Total | 190 | 60 | 250 | | | |

p-value=0.260

This table reveal that no statistical significant relationship between mother's type of delivery and jaundice at p-value (0.26)

**Table (5): Association between mothers characteristics as chronic disease with Jaundice (N=250)**

| **jaundice Chronic Disease** | **Yes** | **No** | **Total** | $\chi^2_{obs.}$ | **df** | $\chi^2_{crit}\chi^2_{crit.}$ |
|---|---|---|---|---|---|---|
| Yes | 35 | 10 | 45 | 095 | 1 | 3.841 |
| No | 155 | 50 | 205 | | | |
| Total | 190 | 60 | 250 | | | |

p-value=0.758

This table reveal that no statistical significant relationship between mother's chronic disease and jaundice at p-value (0.75)

## Discussion

The present study has reported that the highest percentage (43.2%) of the study sample is at age group ranged" (26 - 31) "years old . This study is disagrees with [7] study that found the age range" (20-30)years. "On other side , it agree with [6] study which done in Nigeria when reported that the highest percent" (58.5 %) of the study sample is at age group ranged (≤ 30) years old. [4][3] Concerning level of education (47.2%) of the sample were not educated Which likely to be inconsistent with (Pound,2015) study that who revealed that (57.1) & (56.0) of mothers were Completed university. The highest percent of the respondents (92.0%) were not working , which disagree with [7] study done in Nigeria that showed high rates of awareness of EBF among working class mothers. In regarding type of delivery (52%) from them where normal vaginal delivery ,study [9] present that (62.5%) of neonates with normal vaginal delivery Concerning disease (82%) of sample were not have any chronic disease. [8] and [11] present their sample with no disease through gestation, which reliable with the present study outcome when the respondents have no disease as antenatal. The present study shows that 85% where not taking medication , while in a study of [8] who found that the highest percentage (89.0%) of mothers were oxytocin infusion during labor which may be related to absence of chronic disease .The gender of neonate (58% )where female. as the same output of [11] who found that the highest percentage (48.3) of neonate were

female . Majority of the babies included were (84.0%) were gestational age less than 37 weeks, with(35.2% ) where between 1-5 days age begin to complain from yellowish discoloration. it looks like not the same result of [9] study who present his sample as (78.0) of full term were gestational age. Type of feeding among the babies of the mothers included were the highest percentage (65.2) with breast feeding, which dis agreement with [10]found that increase infant enteral intake There is a positive association between number of breastfeeds a day and lower TSB. According to type of management (56.8) where management with phototherapy , as well as [11]found that (82.9%) received phototherapy . Also in agreement with [12] found that when TSB levels rise above the thresholds stated in guidelines, despite adequate lactation support, phototherapy is recommended as the most effective treatment. Concerning weight at birth (46.8) where weight between 2600-3100 gm., which is alike of [10] study who found that the highest percentage (71.3)of neonate were normal weight. The present study found the child order were the first , which in agreement with [15] "who found that The primi para mother is the one of the risk factor of neonatal jaundice. The primi para mother have totaly 23 present the total case. that is the 30 % neonatal jaundice effected in the case of primi para mother".[15] stated that some herbal remedies taken by the lactating mother may apparently exacerbate jaundice in the infant.

**Association**

This study reveal that no relationship between mothers age and jaundice at p-value (0.61)., which incongruent with (Tavakolizadeh,2018) who found that the maternal age was significantly associated with different levels of bilirubin (p = 0.02), indicating a significant correlation of maternal age with incidence of jaundice.

"Moreover, there is no statistical significant relationship between mother's level of education and jaundice at p-value" (0.61) "This result is in agreed with [10] who found that the level of education was found that not significant relationship with Jaundice p-value"( 0.176).

Scientifically and logically which based on literatures, highly significant relation should be between mother's occupation, type of delivery and jaundice, as mentioned by [10], even though the present results was no statistical significant relationship.

This present study result reveal that no statistical significant relationship between mother's chronic disease and jaundice at p-value (0.75), which congruent with [14] who found that found that there is no significant relationship *found in the familiar history of diabetes, anemia ,thalassemia ) among neonates with different levels of bilirubin (P = 0.2, 0.3, P = 0.06)*

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved and all experiments were carried out in accordance with approved guidelines.

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# Epidemiology and Outcome of Burn Patients in the Burns Specialty Center at Al-Diwaniyah Province, Iraq, 2019

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## Abstract

**Background:** The stressful consequences of burns included physical injury, psychological trauma and financial problem not only for the victim himself but also to his family. Burn victims may pass through painful experience until getting improved or unfortunately die from a number of burn associated complications; in addition some of them remain crippled for the rest of their lives. Variations among sociodemographic and cultural characteristics of different nations have variable effects of the outcome of burn injuries.

**Aim of the Study:** The current study was carried out in order to identify demographic characteristics of burn patients in association with outcome of burn injuries in terms of morbidity and mortality during the year 2019.

**Patients and Method:** Burns Specialty Center lies in Al-Diwaniyah province, mid-Euphrates region of Iraq. This region is located southern to Baghdad. It is an agricultural Province with a population of approximately 1.5 million. The Burn center is a referral point for burn victims from this region as well as from other mid-Euphrates regions such as Najaf, Babel, Nasiriyah and Simawa. The total number of burn patients admitted to the center during the year 2019 was 411

**Results:** The present study revealed that the age group 7 to 30 was the most frequently affected group accounting for 42.3 %. With respect to gender, children in the current study showed comparable male and female distribution, but, patients above 6 years of age were more likely to be female than to be male; however, statistical wise the difference was not significant. With respect to circumstances, in the current study home accidents were the most frequent situation of burn injury in which patients were mostly children or adult females. In the current study, the most frequent agent was flame, followed by scald, then electrical and chemical injuries. Mortality rate in the current study was 13.6 %.

**Conclusion:** domestic injuries dominated the circumstances of burn, adult patients were most likely women, flame and oil were the most commonly encountered agents and occupational injuries were mainly seen in adult males.

***Key words:*** *Epidemiology, outcome, burn, Iraq, Al-Diwaniyah Province*

## Introduction

Burns are still among the most frequent kinds of injury, in spite of substantial reduction in its incidence in developed nations, being responsible for a significant proportion of traumatic injuries globally and they are responsible for considerable morbidity and mortality worldwide [1,2]. It is estimated, according to WHO reports, that 5 to 10 % of injuries worldwide are due to burns [3]. Medical authorities have recognized the distressing outcomes of burns and a substantial health budget has been allocated for research works worldwide aiming at reducing or modifying these consequences. The adoption of effective preventive strategies by health authorities

in developed countries has greatly reduced the rate of burns as well as morbidity associating traumatic burn [4-6]; however, burn injuries continue to represent great proportion of trauma in developing countries including Iraq [7-9].

Some forms of burns are accidental and others are intentional; however, deciding the intentional nature of burn injury is often challenging [3]. The stressful consequences of burns included physical injury, psychological trauma and financial problem not only for the victim himself, but also to his family [10-12]. Burn victims may pass through painful experience until getting improved or unfortunately die from a number of burn associated complications; in addition some of them remain crippled for the rest of their lives [13,14].

Variations among sociodemographic and cultural characteristics of different nations have variable effects of the outcome of burn injuries [15,16]. Household setting is by far the most frequent form of burn site because of use of fire in a number of home activities such as cooking or the use of fire for purpose of warming in cold weather or other home related activities in which the misuse of inflammable equipments and tools leads to catastrophic burn injuries; not to forget that some form of home related burns are self inflicted [17,18].

The current study was carried out at Burn Specialty Center at Al-Diwaniyah province, Iraq, in order to identify demographic characteristics of burn patients in association with outcome of burn injuries in terms of morbidity and mortality.

## Patients and Method

Burns Specialty Center lies in Al-Diwaniyah province, mid-Euphrates region of Iraq. This region is located southern to Baghdad. It is an agricultural Province with a population of approximately 1.5 million. The Burn center is a referral point for burn victims from this region as well as from other mid-Euphrates regions such as Najaf, Babel, Nasiriyah and Simawa. The total number of burn patients admitted to the center during the year 2019 was 411. Reported data included age, gender, residency and occupation. In addition, circumstances of burn injury were also reported including place of injury, time of injury, cause, agent (scald, oil, fire) and brief description of events (accidental or suicidal). Clinical assessment of burn wound included: site, surface area, degree, depth, severity, complications and final outcome. These data were collected according to a questionnaire form and interview was made with patients themselves or their relatives in children and severely injured patients. Extent of burn injury in adults was done according to Wallace's rule of nine [19] whereas, lynch and blocker was applied to children. The depth of burn was classified into partial and full thickness burn.

## Results

The current study included 411 patients with an age range of 6 month to 80 years and mean age of 23.95 years.The most frequent age group was 7 to 20 years followed by 21 to 30 years ,as shown in table 1.Children under 7 years have almost equal gender frequency, however,women dominated cases above 7 years, as shown in table 2. Most of cases were from rural residency as shown in figure 1.Regarding circumstances, children and women were mostly affected at home while occupation injury as mostly seen in adult men, as shown in table 3.Fire and oil were the most common causative agents, as shown in table 4. Partial thickness was the most frequent type of burn, figure 2 and the most common outcome was cure ,figure 3.

**Table 1: Frequency distribution of burn patients according to age**

| Age (years) | Number of cases | % |
|---|---|---|
| ≤ 6 | 151 | 36.7 |
| 7-20" | 102 | 24.8 |
| 21-30 | 72 | 17.5 |
| 31-40 | 43 | 10.5 |
| 41-50 | 25 | 6.1 |
| > 50 | 18 | 4.4 |
| Range | 6 months – 80 years | |
| Mean ±SD | 23.95 ±16.7 | |

**Table 2: Frequency distribution of burn patients according to age and gender**

| Age (years) | Total n = 411 | Male n = 195 | | Female n = 216 | | P |
|---|---|---|---|---|---|---|
| | | Number | % | Number | % | |
| ≤ 6 | 151 | 79 | 52.3 | 72 | 47.7 | 0.200 ¥ NS |
| > 6 | 260 | 119 | 45.8 | 141 | 54.2 | |
| Total | 411 | 195 | 47.4 | 216 | 52.6 | |

***n***: number of cases; **¥**: Chi-square test; **NS**: not significant at $P > 0.05$

**Figure 1: Distribution according to residency**

**Table 3: Frequency distribution of burn patients according to circumstances of burn injury**

| Circumstances | Total n = 411 | Female n = 141 | Male n = 119 | Children n = 151 | P |
|---|---|---|---|---|---|
| Home | 288 (70.1 %) | 96 (68.1 %) | 41 (34.5 %) | 151 (100.0 %) | Reference |
| Occupation | 72 (17.5 %) | 5 (3.5 %) | 67 (56.3 %) | 0 (0.0 %) | < 0.001¥ HS |
| Unknown, suicidal and others | 51 (12.4 %) | 40 (28.4 %) | 11 (9.2 %) | 0 (0.0 %) | < 0.001¥ HS |

***n***: number of cases; **¥**: Chi-square test; **HS**: Highly significant at $P \leq 0.01$

**Table 4: Frequency distribution of burn patients according to agent of injury**

| Agent | Total *n* = 411 | Female *n* = 141 | Male *n* = 119 | Children *n* = 151 | *P* |
|---|---|---|---|---|---|
| Fire, oil | 188 (45.7 %) | 106 (75.2 %) | 55 (46.2 %) | 27 (17.9 %) | Reference |
| Scald | 165 (40.1 %) | 28 (19.9 %) | 17 (14.3 %) | 120 (79.5 %) | <0.001¥ HS |
| Electrical | 48 (11.7 %) | 7 (5.0 %) | 37 (31.1 %) | 4 (2.6 %) | <0.001¥ HS |
| Chemical | 10 (2.4 %) | 0 (0.0 %) | 10 (8.4 %) | 0 (0.0 %) | <0.001¥ HS |

***n***: number of cases; **¥**: Chi-square test; **HS**: Highly significant at $P \leq 0.01$

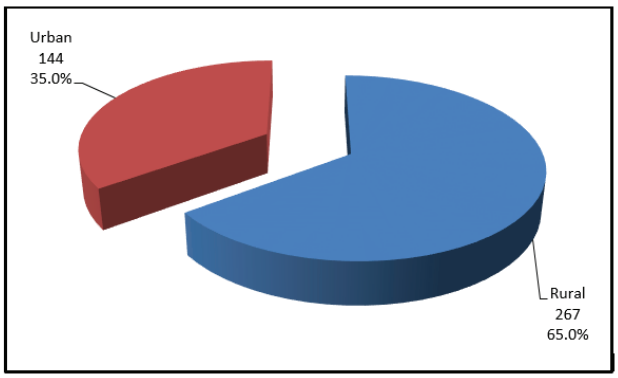


**Figure 2: Distribution according to depth of burn**

## Discussion

Burn injuries and their related morbidity and mortality represent a public health problem of increasing importance in developing countries (20). Epidemiological studies of morbidity are essential for effective burn prevention programs because each population seems to have its own epidemiological characteristics and knowledge of the epidemiology of burns is needed to select target groups for preventive measures. Initial management of burn is very important. First aid measures, like wound cleaning and removal of source of injury significantly improve outcome and reduce mortality and health cost. Age and gender are important epidemiologic determinants of burn injuries. The present study revealed that the age group 7 to 30 was the most frequently affected group accounting for 42.3 %. This high rate among young adults and adolescence may be explained by the fact that they are generally active and exposed to hazardous situations both at home and at work. The second most common age was children under 6 years of age accounting for 36.7 %. This may be attributed to unawareness about the dangerous nature of objects they are playing with. The least frequent age group was >40, and this may be explained by their long stay with their families at home which limits their exposure to hazardous situation and this represents a socio-cultural determinant of burn injury. The frequency distribution of burn patients in the current study is comparable to that obtained by other researchers in Egypt and Pakistan [22,23]. The most frequently affected age group in the Egyptian study was 11 to 30 years and that in the Pakistani study was 10 to 30 years, 47.0 % and 55.3 %, respectively. The occurrence of burn injury in a particular age group more frequently that other groups can be attributed to variation in behavioral aspects dominant in that particular age group. In the present studies, most of patients were from rural inhabitants and this may be due to low socioeconomic status, poor education and less availability of safety measures during cooking. With respect to gender, children in the current study showed comparable male and female distribution, but, patients above 6 years of age were more likely to be female than to be male; however, statistical wise the difference was not significant. The predominance of female patients in burn injuries is a common observation by a number of authors [23,24]; however, other authors denied such predominance. Cooking and other domestic activities are the main blamed reason for adult women to outnumber adult men in burn injuries [22]. On the other hand socio-cultural characteristic plays an important role in determining gender variation in incidence of burn injuries in developing countries such as Iraq.

With respect to circumstances, in the current study home accidents were the most frequent situation of burn injury in which patients were mostly children or adult females. This finding agrees with the findings of other previous studies in developing countries [22,23].

Occupational burn injury accounted for a minority of patients in the current study and victims were mostly men. On the other hand, burn due to suicidal attempt of unknown reasons and other causes accounted for small fraction of patients' sample in accordance with some previous studies [23].

In the current study, the most frequent agent was flame, followed by scald, then electrical and chemical injuries. Similar approximate results were recorded by previous authors in developing countries [25,26].

Mortality rate in the current study was 13.6 %. Indeed, the mortality rate in our study is less than that recorded by some previous authors [22,24]. On the other hand, significant proportion of our patients has left the hospital against doctor recommendations which may be explained by poor socioeconomic status or by low level of education. The cure rate in the current study was relatively acceptable.

### Conclusion

Domestic injuries dominated the circumstances of burn, adult patients were most likely women, flame and

oil were the most commonly encountered agents and occupational injuries were mainly seen in adult males. Therefore, measures such as early and proper medical intervention and wear of flame resistant cloths may reduce both the mortality and morbidity associating burn injuries in our country.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Burns Specialty Center and all experiments were carried out in accordance with approved guidelines.

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# The Effect of Fixed Force Exercises by Using Different Tools in the Values of Some Bio Kinematics Variables to the Hit/Spike Skill in Volleyball for Young People

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## Abstract

The muscular training by adopting fixed foundations is a modern training methods which is concerned with the development of muscle strength, in fullest stretch This is due to the quality of the exercises that selected and designed according to the requirements of skill performance which performance is subject to a set of variables that determine the characteristics of this technical performance of the hit/spike skill, it causes production of the kinetic system, needed by good skill performance as well as the appropriate correct compatibility that occurs between the variability in the kinematic and kinetic variables determined by the stress used is the best way to success performance as well as the stabilization and orientation of muscle groups to serve skill performance, so the researchers used the experimental method using experimental design of one group appropriate to the nature of the research, the The study sample was chosen by the researchers in purposive method, numbering 6 athletes, The researchers were keen to apply the stationary strength training using different tools for the purpose of some Bio kinematics indicators and the development of muscle strength for sample members (8) weeks and included (24) training units (3) units per week, The results of the research was the most important that all the exercises used to develop the fixed force, whether the muscles of the legs, torso or arms, increased the efficiency of the internal force, the strength of ligaments in the production of torque force.

***Keywords:*** *Bio kinematics, hit/spike, skill, volleyball, young people*

## Introduction

The great developments in volleyball today in all its skills [1], including the skill of hit/spike led to achieve advanced results in the level of achievement at the Arab and global level because it is one of the skills covered by this development as a result of the competition of the countries of the world in the innovation of modern scientific foundations of training through conducting studies and research, which mixes two or more sciences of Physical Education Sciences [2]. Fixed strength is one of the physical characteristics should developed for volleyball players, which is related to the ability of the athlete and efficiency on the production of muscle strength related to rapid performance. Where the training of musculature by adopting the foundations of the fixed strength of modern training methods [3], which is concerned with the development of muscle strength in the most elastic, this is due to the quality of the exercises selected and designed according to the requirements of skill performance in which the performance is subject to a set of variables that determine the characteristics of this technical performance of the skill of hit/spike , be the cause of the production of the kinetic system, which needs good skill performance as well as the appropriate compatibility [3] that occurs between variance in variables Kinematics and kinetics determined by the stress used is the best way to success performance as well as stabilize and guide muscle groups to serve skill performance and thus develop the level of muscle strength because these exercises put a relatively large muscle effort which leads to Stimulating muscle groups [4] to mobilize as many muscle fibers as possible and possessing the ability of rapid muscle contraction and stimulate them to work with great capacity, in turn contribute to the achievement of effective dynamic and

effective work during the sections of the skill, and in a way that serves the goal of performance is to achieve the farthest distance, [5] whether horizontal during the last step or vertical distance During the final payment, this is a real indicator in the development of the ability of the coach to understand and analyze the skill performance of the players in the light of the information that may help him in determining [6] the kinetic procedures required to accomplish the performance as efficiently as possible with the least effort.

**Research methodology and field procedures**

Research Methodology

The researchers used the experimental approach using a one-group experimental design appropriate to the nature of the research.

**Research Sample**

Six players were selected from the Iraqi volleyball team and deliberately in order to carry out the study and achieve its objectives, and table (1) shows the characteristics of the research sample.

**Table 1. It shows the homogeneity of the sample in the variables of height, age of training and apparent weight**

| NO. | Properties | Arithmetic mean | Standard Deviation | Coefficient of variation |
|---|---|---|---|---|
| 1 | Length (cm) | 188 | 0.72 | 1.96 |
| 2 | Age of training (Year) | 4.83 | 0.35 | 11.16 |
| 3 | Outside weight | 77 | 3.15 | 3.12 |

**Exploratory trail**

Researchers made exploratory trail On Saturday, (1/6/2019) on (3) players from the sample members were photographed to identify the location of the power measurement platform and make the cameras far and high and the clarity of the image and the time required for each shooting and the appropriate time to make the shooting as well as to identify the following:

- Height of cameras

- Identify the difficulties and obstacles that will appear during the implementation of tests and their progress.

- Identify the time to take the tests and how long it takes.

- The possibility of imaging and analysis of the results of mechanical variables.

- The ability of the sample to carry out the tests and their suitability.

- Identify the devices and tools necessary to carry out the experiment and tests.

- The possibility of measuring the strength of the device used.

- The total time required by the experiment and the definition of the team and the nature of the experience and requirements.

**Main trail**

Exercises were prepared after reviewing a set of sources of sports training related to the subject of the research and after presentation to the gentlemen experts have been the application of exercises, the exercise method was (Repeat contraction) in order to improve the fixed strength of the research sample members using different training tools on 5/6/2019 to 6 / 9/2019 in (8) weeks and includes (24) training units, some solid resistances have been used, some of which are manufactured, which allow the player to use technical conditions similar to the technical performance of the skill to develop the fixed muscle strength and muscle

at its maximum elongation and is a new training trend because it focuses on the development of iso-metric contraction which is the boundary between the central and decentralized contractions which contributes to increase The values of muscle strength and thus maintain the momentum of muscular and kinetic momentum at the highest efficiency possible according to the limits of the muscular moment allowed anatomically and technically and thus increase the strength and speed of the costly part of the performance and high efficiency by fixing the tension on the muscle with the Changes and differences in the angles of muscular work during the performance of muscle exercises using fixed resistances, rest was given between iterations according to the time of effort to rest .

The researchers used the method of repetitive training by three training units per week at the time of one training unit (35 - 45 minutes). Below is a summary of how to use the intensity of different exercises:

• For fixed workpiece workouts with fixed solid resistances, the maximum contraction time for a specific time is determined and the training intensity is determined accordingly.

**Statistical means**

The researchers used the SPSS statistical program to process the results.

**Presentation, discussion and analysis of results**

Presentation and discussion of the results of differences in the values of some Bio kinematics indicators for the hit/spike of the pre- and post-test of the research group .

**Table 2 shows the values of the arithmetic media, the standard deviations and the calculated value (T) of the values of some Bio kinematics indicators of the pre- and post-tests of the research group.**

| NO. | Processors Variables | Measuring unit T | Pre-test | | Post test | | Calculated time value | Significance level 0.05 | result |
|---|---|---|---|---|---|---|---|---|---|
| | | | from | s± | from | s± | | | |
| 1 | Approaching speed | m/sec | 3.30 | 0.07 | 0.07 | 3.88 | 18.014 | 0.000 | moral |
| 2 | Cruising speed | m/sec | 2.73 | 0.13 | 0.06 | 3.16 | 8.861 | 0.000 | moral |
| 3 | Angle of advancement | min | 76.62 | 0.74 | 0.53 | 87 | 32.031 | 0.000 | moral |
| 4 | Maximum height | m | 1.34 | 0.01 | 0.01 | 1.48 | 29.238 | 0.000 | moral |

The researchers attribute the reason for this development to the nature of the exercises applied by the research sample using muscle groups to perform in the same general direction to perform the same skill led to the development of the strength of the strength in the muscle groups working in a way that helps the player to complete the kinetic duty in the best technical style, as well as the impact of this positive In developing the efficiency of muscle strength according to the internal and external forces that were consistent with the size of the force generated during the performance, the muscles were stimulated to work with a high force, starting with the change in their length before their shrinking. As the moral differences that appeared in the approach speed variable researchers attribute to the nature of the exercises applied by the research group contributed to

the development of muscle strength and adaptation of muscle groups to shrink strongly and high speed as well as the adaptation of the feet to take the right positions when touching the ground with a little contact area, and to take the situation Appropriate for the method of performance of the skill to be the force projected on the surface of the foot is highly effective and rated time according to the intensity used in training led to sizes or reduce the time touching the ground during the movement and thus increased the speed of the player's thrust towards the ball in a vertical and smooth Good muscular consistency had a great impact on the development of cruising speed as the positive output obtained by the research sample enabled them to push the maximum intraday moment associated with full stretch in a joint and in an ideal manner, which means that the level of progress was faster and better than the level of special force not to mention that it helped On reducing the distance between the center of gravity of the body and the gravitational line, which in turn contributed to the formation of a base or a suitable starting position contributed to positioning the center of body mass at the highest possible point, an effective indicator of its efficiency to shrink as quickly as possible.

| No | | Variables | Measuring unit | Pre-test Experimental group | | Post-test Experimental group | | Calculated time value | Significance Level 0.05 | result |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | from | s± | from | s± | | | |
| 1 | Absorption moment | Absorption force | N | 942.12 | 104.23 | 1407.60 | 81.28 | 7.381 | 0.000 | moral |
| | | Time of arrival | Sec | 0.24 | 0.03 | 0.19 | 0.01 | 3.742 | 0.007 | moral |
| 2 | Pushing moment | Maximum power | N | 1121.74 | 228.47 | 1749.56 | 107.72 | 6.501 | 0.000 | moral |
| | | Time of arrival | Sec | 0.18 | 0.02 | 0.13 | 0.01 | 4.697 | 0.002 | moral |

**Presentation and discussion of the results of the differences in the values of some power-time indicators for the hit/spike of pre- and post-tests of the research group**

**Table 3.** It shows the values of the arithmetic media, the standard deviations and the calculated (T) value of the values of some power-time indicators for the pre- and post-tests of the research group.

The researchers attribute the reason for this development as a result of the impact of stationary strength exercises using various tools applied by the research group on the scientific basis associated with Bio kinematicss, contributed to the development of internal strength and external strength as a result of the players to achieve a high muscle strain or contraction after the change in muscle length as a result of pulling or pushing, Greater than the muscles show in the case of shrinking or kinetic tension, as the player during this exercise works on the use of high strength against the weights are unable to move them and thus reflected positively on the technical performance of the skill and this was evidenced by the increase in the values of momentary mechanical strength This is reflected in the appropriate linear or angular momentum and the possibility of retaining this value during the performance stages because it represents a good flow of movement, as the development in the values of maximum absorption force as it positively affected the maximum force values of the final push because the preparatory section serves the section The main objective is to create the necessary force for the performance of the kinetic , as the preparatory section is directly related to the goal of the skill, while the time achieved indicates the impact of the exercises on the development of strength and increase during the preparatory phase and the player's push towards the ball, As for the time variable power, the researchers believe that the time variable is one of the mechanical variables that play a big role in the variables of power and speed., so it can be important for this variable in achieving linear speed.

## Conclusions

1. The emergence of a clear development in the level of technical performance of the skill of the hit/spike as a result of the development of fixed force using different tools and resistances.

2. All the exercises used to develop the fixed force, whether the muscles of the legs, torso or arms, increased the efficiency of the internal force, the strength of the ligaments in the production of torque force.

3. There was a continuation of the speed between the steps of the rhythm and the last step without any hindering forces that would occur if the jogging was a full contact with the foot as the forces of gravity, weight or friction.

4. The positioning on the lower foot area gives the positive feedback in increasing the momentary momentum and decreasing the relative base of the final base at the moment when the striker prepares him and provides him with a smooth and fast performance that allows to exert the required strength and speed to achieve a good speed and starting angle.

5. Static force training using various tools enhanced the reduction of the contact area of the foot with the ground, which facilitated the application of instantaneous force correctly according to absolute performance angles during the technical performance stages of the hit/spike skill.

6. The diversity in the training load configuration and the methods used in its application, and the nature of the fixed muscle contractions have had a significant impact in the development of mechanical strength of the stages of performance, and the spirit of competition among members of the research group.

## Recommendations

1. Emphasis on conducting fixed strength exercises, especially for muscles working on the joints of the hips, knees and ankles, as well as on the muscles working on the joints of the shoulders, elbows and wrists, as applied in the research to its importance in achieving speed approach approaching and positioning the center of body mass at the highest possible height due to the development of muscle strength During performance.

2. Conducting strength exercises with fixed resistances, can contribute to the integration of performance and increase the efficiency of muscles and adapted to the goal of the required movement.

3. Conducting complementary studies aimed at studying other Bio kinematics variables (kinetic energy, angular power, etc.).

4. Emphasis on the application of various fixed strength exercises to develop the strength of the muscles stretching responsible for the maintenance of skill performance and integration.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Faculty of Education for Girls University of Thi-Qar and all experiments were carried out in accordance with approved guidelines.

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# Nurses' Knowledge, Attitude and Practice Towards Preparedness of Disaster Management in Emergency of Mosul Teaching Hospitals

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## Abstract

**Background:** Disasters define as event everywhere in the world every day and have a significant impact on individuals, families, group and communities.

**Objectives**: The aim of the study was to assessment the nurses' knowledge, attitude and practice about preparedness of disaster management in emergency of Mosul teaching hospitals/Iraq

**Materials and Method:** In a cross-sectional analysis. The questionnaire consists of (4) main sections: section one demographic date e.g: (age, sex, experience, education level, marital status, and hospitals). Section two included: (47) items related to level of knowledge among nurses about disaster preparedness. Section three consists of (11) elements concern attitude about disaster management. Section four related to practice of regarding disaster management.

**Results:** indicated the finding of the study nurses' knowledge, attitude and practice about preparedness of disaster management in emergency department of Mosul teaching hospitals are highly significant.

**Conclusion:** Through the findings of the study concluded that the awareness or knowledge of nurses is high with a neutral level of attitude, also practice with respect to disaster preparedness was satisfactory.

***Keywords**: Knowledge, Attitude , practice, Disaster Management.*

## Introduction

Disaster is the main functional degradation or loss of resources such as life, economy and buildings [(1)]. Disasters event everywhere in the world and have influence on people, families, group and communities [(2)] . The first decade of the 21century had increased consciousness of the possible danger posed by disasters, both natural and manmade, to modern society [(3)]. Disasters can be categorized to natural and manmade natural disasters occur from natural causes which include volcanic eruptions, hurricanes, burning, which tornadoes. Infectious catastrophes may also be marked as pandemic [(4)] .While (Hassmiller and Stanley, 2013) stated the disasters can be three categorized group included: natural disasters such as floods, droughts, earthquakes, disease epidemics, technical incidents such as fires, structural failure, radiological accidents, civil / political events such as attacks, terrorism and biological warfare[(5)]. Approximately 48% of all disasters occurred in 2014 in asia had an area that was largely disaster-induced, reporting that (90.13percent) of worldwide disasters came through asia [(6)]. In Iraq[(7)] , an epidemiological study between years (2008-2012) indicate that the highest death rate due to disasters, including terrorism, was in 2008 due to sectarian conditions at a rate of (24.36%). Disaster preparedness, risk assessment and multidisciplinary management of all levels of the system, is essential to providing

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successful solutions to a disaster stricken population's short and long term health needs[8]. The World Health Organization has recommended that all countries must be prepared for crisis they face crisis and most nurses have ineffectively trained for disasters [9]. The recovery mechanism is structured to handle disasters and help those who are at risk of catastrophe and recover after the crisis has been caught up to allow the individuals who have been impact to benefit from the catastrophe [6]. Nurses 'role in and recovery of disaster management includes emergency preparedness, prevention, response and recovery from emergencies and after disasters [10] In Iraq the last fifteen years the frequency of disasters has increased, especially terrorism and traffic accidents.The aim of the study to assess of KAP of nurses' in disasters management at teaching hospitals in Mosul City.

## Methodology

This study employed a questionnaire to evaluate the awareness, attitude and practice of nurses in Mosul's teaching hospital / Iraq about disaster management preparedness. The research sample conducted at Mosul teaching hospital included: (Ibu-Sena Teaching hospital, Al-Jumhoury teaching hospital, General Mosul hospital, Al-khansia teaching hospital and Abu-ather teaching hospital) only, nurses workers in emergency department . In the present analysis a cross- method was applied and Consisting of nurses (76). Data obtained since December 10, 2019 extended to December 30, 2019. This instrument adapted by (Miller,2011; and Moabi,2008). Consists of (4) main sections: section one demographic date e.g: (age, sex, experience, education level, marital status, and hospitals). Section two included: (47) items included: MCQ , True and False, protected information disaster management and preparedness questions with each question listed as correct (=1) and incorrect (=0). Section three consists of eleven elements classified as agree, disagree and unsure for determining the checklist of attitudes about disaster management. Four section practice of regarding disaster management current procedures included concerns about emergency exercises conducted at their healthcare facilities, what types of exercises are undertaken, ongoing preparation, how frequently, updating the emergency plan .The data were analyzed using the SPSS (V:22) and descriptive statistics and inferential statistics (means of score , standard deviation and frequency) between nurses, awareness or knowledge , attitude and practice on disaster management preparedness in Mosul hospital teaching

## Results

**Table 1: Frequency distribution of demographic data (n=76) of the emergency nurses.**

| Nurses Demographic Data | Number | Percentage |
|---|---|---|
| Age | | |
| 22-32 Year | 44 | 57.9% |
| 32-42 Year | 26 | 34.2% |
| >42 Year | 6 | 7.9% |
| Mean ± SD | 28.40±7.67 | |
| Gender | | |
| Male | 30 | 39.5% |
| Female | 46 | 60.5% |
| Marital status | | |
| Single | 8 | 10.5% |
| Married | 65 | 85.5% |
| Widowed | 3 | 4% |
| Hospital | | |

***Cont...*** **Table 1: Frequency distribution of demographic data (n=76) of the emergency nurses.**

| | | |
|---|---|---|
| General Mosul | 12 | 15.8% |
| Ibn- Senia | 13 | 17.1% |
| Al-Khansia | 16 | 21% |
| Ibn-Atheer | 14 | 18.5% |
| Al-Jumhoury | 21 | 27.6% |
| Experience of years | | |
| Less than 5 years | 12 | 15.8% |
| 5-10years | 29 | 38.2% |
| >10years | 35 | 46% |
| Mean ± SD | 8.85±3.64 | |
| Level of education | | |
| Bachelor of nursing | 18 | 23.6% |
| Diploma of nursing | 49 | 64.5% |
| Secondary of nursing | 9 | 11.9% |

**Table 2: Knowledge score regarding disaster among study respondents (n=76)**

| **Knowledge of Score (1-47)** | **Number** | **Percentage** |
|---|---|---|
| (1-12) | 5 | 6.6% |
| (13-24) | 51 | 67.1% |
| (25-36) | 18 | 23.7% |
| (37-47) | 2 | 2.6% |
| Mean ± SD | 22.35±5.95 | |
| t value | (55.82) and P≤ (.001) (High Sign) | |

**Table (3): Attitude regarding disaster preparedness among the study respondents (n=76)**

| **Attitude variables** | **Agree** | **disagree** | **Unsure** |
|---|---|---|---|
| I don't need to know about operational preparations for an emergency (disasters) | 49(64.5) | 21(27.6) | 6(7.9) |
| Management should be prepared appropriately in the event of a disaster | 55(72.4) | 16(21) | 5(6.6) |
| In the hospital environment, disaster preparation is for everyone. | 40(52.6) | 28(36.9) | 8(10.5) |
| Potential threats that are likely to cause catastrophe should be identified and handled. | 57(75) | 11(14.5) | 8(10.5) |
| Training is required for all nurses | 62(81.6) | 12(15.7) | 2(2.7) |
| Do you think operational plan for an emergency (disaster) is necessary | 60(79) | 13(17.1) | 3(3.9) |
| Operational emergency (disaster) plan needs to be revised periodically | 54(71) | 16(21) | 6(8) |
| Disasters at our hospital are unlikely to happen | 33(43.5) | 29(38.1) | 14(18.4) |
| Managing the tragedy is not limited to nurses and doctors | 41(54) | 25(32.9) | 10(13.1) |
| Simulations of a catastrophe will always take place in the hospital | 53(69.7) | 16(21) | 7(9.3) |
| Drills will be held in hospital | 59(77.6) | 12(15.8) | 5(6.6) |
| t value 64.289 P≤ .001 | | | |

**Table 4: Percentages of the study respondents practice regarding disaster preparedness (n=76)**

| Variable | Yes | No | don't know |
|---|---|---|---|
| Can you do emergency drills at your hospital? | 49(44.5) | 16(21) | 11(14.5) |
| If so, what kind of drills do they do? | 43(56.5) | 21(27.6) | 12(15.8) |
| Is there ongoing training? | 32(42.1) | 28(36.8) | 16(21.1) |
| Is the disaster plan periodically updated? | 24(31.6) | 22(29) | 30(39.4) |
| t value = 43.23 Sig. P ≤.001 High Sign | | | |

## Discussion

The present study was aimed to investigate nurses' KAP regarding preparedness of disaster management in emergency of Mosul teaching hospitals/Iraq. Table (1): showed that the study respondents were aged between (22-32) years with a mean score of (28.40±7.67).The educational standard for approximately (64.5 percent) nursing diploma. There was almost (85.5 per cent) married, the present study found that two thirds of emergency nurses were female, this could be attributed to the large number of female nurses who were frequently present during the morning shift, almost (39.5%) male, female were (60.5%) this result was accepted with [(1)], found the majority of the sample were women. Table (2): show that the level of disaster knowledge fell between two-thirds of the study sample in the group of (13-24) degree of 47 degree with average score of (22.35±5.95) by very significant differences in value t=(55.82) and P≤ (.001). study in Jordanian by (Khalaileh,2012) were investigated of awareness, and preparedness for disaster management.The results suggested that knowledge need to be continually improved in order to change the efficacy for disaster response, and an Integrated emergency Preparedness Program to raising awareness about disaster management. Table 3: shows the percentages of the research participants 'agreement on disaster preparedness attitude that were as follows: (64.5%) agreed on the need for awareness of emergency plans,(72.4%) appropriate preparation should be prepared in the event of a catastrophe,(52.6%) emergency readiness should be planned for all people in the hospital environment,(75%) possible disaster threats should be recognized and addressed, (81.6%) preparation is required for all healthcare management, (79%) emergency planning is important, (71%) emergency plans should be revised regularly,(43.5%) accidents are likely to occur in every hospital setting,(54%) emergency management is for all healthcare teams,

(69.7%) catastrophe scenarios should be routinely conducted in hospitals and (77.6%) exercises should be conducted in hospitals. A highly significant difference of attitude was found (t value = 64.289, and P≤.001). Several KAP studies on disaster and emergency preparedness for nurses were performed. A research conducted by Hong Kong nurses found that nurses are not sufficiently trained for disasters, but are mindful of the need for such preparedness. Furthermore, emergency management instruction will be included in nurses basic education [(14)]. Table 4: reveals that 44.5 percent of the participants in the study were conscious that emergency drills are being performed at their healthcare settings. 21 percent said they weren't done and 14.5 per cent said they didn't. 15.8 percent did not know what kind of drills were done. They reported code blue and fire evacuation of the remaining 56.5 per cent. 42.1 per cent claimed their healthcare facilities had ongoing preparation. 31.6 percent reported that the training was conducted quarterly, 29 percent had not been completed and 39.4 percent had not. There was a highly important difference in the degree of activities as t value = 43.23 and P≤ .001.This research in Egypt (Khalil, et al., 2019) disagreed with the present report, showing that there was no substantial difference between the activities of nurses regarding disaster preparedness and their demographic characteristics.

## Conclusion

Through the findings of the study concluded that the

awareness or knowledge of nurses is high with a neutral level of attitude, also practice with respect to disaster preparedness was satisfactory.

## Recommendation

Based on the findings of this report, the researchers suggested that emergency nurses need to incorporate explicitly named theory and practice; teaching disaster and emergency preparedness courses in nursing curricula is important and appropriate in terms of their preferences for training.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the University of Mosul and all experiments were carried out in accordance with approved guidelines.

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# Molecular detection of Virulence Factors genes Associated with Immune Resistance in Klebsiella *pneumonia*

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## Abstract

The current study was aimed to genotypically detection of genes encode outer membrane proteins related with human serum resistance. A total of 33 isolates were identified as Klebsiella *pneumonia* according to the manual cultural characteristics and biochemical tests and then confirmed by Vitek -2 system. The number of isolates according to site of infection were 14 (42.4%) isolates from wound infection, 15(45.4%) isolates from urine, 1(3.03%) isolates from blood, 1(3.03%) isolates from vagina,1(3.03%) from ear swab and finally 1(3.03%) isolates from stool. The present study demonstrated a positive relationship between the ability of bacterial isolates to antibiotics resistance and the occurrence of some virulence genes. The molecular detection of some virulence genes (*htrA, rmpA, mrkA and iss*) was done by conventional PCR technique. It was found that ,high occurrence of *htrA* gene was observed among *Klebsiella pneumonia* isolates which was found in 26(78% ) of isolates at 1071bp , then 17(51%) isolate were positive for *rmpA* gene at 967 bp,whereas *mrkA* gene was recorded in 5(15.15%) isolates at 862 bp , and only 4(12.12%) isolates gave positive result for *iss* gene at 450bp.

***Key words**: Klebsiella pneumonia, molecular detection, virulence gene.*

## Introduction

*Klebsiella pneumonia* is commonly dispersed in the gastrointestinal, urinary, and respiratory tracts of healthy people [1]. It causes opportunistic infections and nosocomial infections; it is a popular hospital-acquired pathogen causing severe respiratory infections such as pneumonia. Other infections caused by this organism include urinary tract infection, wound infection, abscesses, sepsis, inflammation, and diarrhea [1]. *K. pneumonia* have different virulence factors which provide bacteria the capacity to invade the host, such as capsular polysaccharide, lipopolysaccharide, serum resistance, siderophores production, fimbriae and other factors such as the production of urease and enterotoxin [2,3]. However, antibiotic resistance properties are the major factor in its pathogenicity that it resists for a wide spectrum of antibiotics and specially β-lactam antibiotics ,particularly those involved in nosocomial diseases [4,5]. The *mrk*A gene encodes the fimbrial subunit, which is polymerized to form the helical fimbrial shaft the adhesive subunit, with the ability to bind to collagen molecules, is encoded by *mrk*D and located at the tip of the fimbriae [6]. *Iss* gene has been localized to gain virulence plasmids and shares sturdy similarities with the bor gene from bacteriophage [7]. *htr*A gene is now of interest because *htr*A mutant strains of several gram-negative bacteria have been shown to be attenuated in animal models and can also be used as vaccines [7]. *rmp*A gene the regulator of the mucoid phenotype A (*rmp*A) is a mucoid factor which is responsible for the regulation of the capsular polysaccharide biosynthesis Cheng (2010). Wide spreading of K. *pneumonia* infections and antibiotic resistance properties for a large spectrum of antibiotics appeared among K. *pneumonia* isolates were a cause to study the prevalence of some virulence genes associated with serum resistance among K. *pneumonia* isolates in Babylon province, Iraq as indicator for distribution of the bacterial infections.

## Materials and Method

### Isolation and Identification

Thirty-three isolates of Klebsiella *pneumonia* were

collected from different clinical sources (urine, blood, stool, vagina, ear swab and wound) from patients were admitted to Hilla teaching hospital, AL-Hashimia general Hospital and medical city of Merjan in Babylon province during the period from July 2019 to December 2020. Each specimen was inoculated on selective media and identified by biochemical reaction according to the diagnostic procedures recommended in (Forbes *et al.*, 2007). Diagnosis was established by the automated method Vitek® 2 (BioMérieux).

**Molecular Detection of Some Virulence Factors**

We using PCR technique for detection of some virulence gene include (*htrA, rmpA, mrkA and iss*)

**Extraction of Bacterial DNA**

The whole bacterial DNA was extracted from bacterial isolates by using Genomic DNA Mini Bacteria Kit that provided by the company favrgen, tiwan). The DNA solution was stored at -20°C till used in PCR.

**PCR Amplifications**

Recognition of virulence genes in *Klebsiella pneumonia* isolates was achieved by amplifying PCR. The PCR primers were provided by (Techne (UK). The product size and sequences of the PCR primers are showed in Table 1.

**Table 1: The size and sequences of primers used in current study**

| Gene name | Primer sequence (5'- 3') | | Product size (bp) | References |
|---|---|---|---|---|
| rmpA | F | CGCAGAAGTATTCCGTTGGT | 967 | AB289644.1<br>This study |
| | R | TTTGTTAGCCGTGGATAATGG | | |
| mrkA | F | AGTGCTTTCACCCCCTCCT | 862 | M55912.1<br>This study |
| | R | GAGTGACTGGGGTGAGCAAA | | |
| iss | F | TGTCACATAGGATTCTGCCGTT | 450 | NZ_RZLR01001650.1<br>This study |
| | R | TTCACCCTCAGAGAGAGGCT | | |
| htrA | F | CGTTCTGCCAGGATGGTTCT | 1071 | AJ430233.1<br>This study |
| | R | CCCCAATGATGACATCGCCT | | |

## Results and discussion

The distribution of bacterial genes according to the site of infection

The study showed that *K. pneumoniae* isolates were distributed regarding different site of collection as the following: 14(42.4%) isolate from wound, 15(45.4%) isolates from urine, 1(3.03%) isolate from blood, 1(3.03%) isolate from ear swab,1(3.03) from stool and also 1(3.03%) isolate from vagina (Table 2, 3). The prevalence of, *htrA*, *rmpA* (42.4%) (21) wound *mrkA* and *iss* genes was (9%), *htrA* (27%) *rmpA* (21%), *mrkA* (21%), *iss* (0%) urine. The total of gene *htrA* (78%), *mrkA* (21%), rmpA (18%) and iss (12%) (table 2).

The virulence-associated phenotypes including complement resistance, adhesion and invasion, and

maintenance within macrophagesThese result was agreed with several previous studies like that established by Ravichitra et al. (2014) and Biradar et al. (2015), whose found that K. pneumoniae was the most typical member of Klebsiella spp. Which will cause severe infections.

**Table 2: Distribution of *Klebsiella pneumonia* isolates according to the site of infection (N=33)**

| Site of infection | No. of K. pneumoniae | Percentage (%) |
|---|---|---|
| Wound | 14 | 42.4 |
| Urine | 15 | 45.4 |
| Blood | 1 | 3.03 |
| Vagina | 1 | 3.03 |
| Stool | 1 | 3.03 |
| Ear swab | 1 | 3.03 |
| Total | 33 | 100% |

**Table 3: The distribution of virulence factors genes among bacterial isolates according to site of infection**.

| Source of isolate | htrA (%) | rmpA (%) | mrkA (%) | iss (%) |
|---|---|---|---|---|
| Wound | 14/33(42.4%) | 7/33(21%) | 3/33(9%) | 3/33(9%) |
| Urine | 9/33(27%) | 7/33(21%) | 1/33(3%) | 0/33(0%) |
| Blood | 1/33(3%) | 1/33(3%) | 1/33(3%) | 1/33(3%) |
| Vagina | 0/33(0%) | 1/33(3%) | 1/33(3%) | 0/33(0%) |
| Stool | 1/33(3%) | 0/33(0%) | 0/33(0%) | 0/33(0%) |
| Ear swab | 1/33(3%) | 1/33(3%) | 0/33(0%) | 0/33(0%) |
| Total | 26(78%) | 17(51%) | 6(18%) | 4(12%) |

Phenotypic detection of Virulence factors:

Virulence factors of *Klebsiella pneumoniae* demonstrated in this work included production of capsule, serum resistance and biofilm formation.

Capsule production:

The results all *Klebsiella pneumoniae* isolates(100%) were positive for capsule production These results in the present study agreed with power *et al.,*(2004), who found that capsule production is considered as an important virulence factors in bacterial pathogenicity because capsular material forms thick bundles of fibrillous structures covering the bacterial surface in massive layers.

**Biofilm Formation ability by *Klebsiella pneumoniae*:**

Biofilm formation ability of *K. pneumoniae* was investigated in this study and the results showed that 2 isolates (10%) strong, 9 isolates (30%) had moderate capacity of biofilm formation, while only 15 isolates (40%) were weak producers of biofilm, and non 7isolates (20%).

Biofilm formation capacity of *Klebsiella pneumoniae* in the current study was tested on ELISA plate as an inanimate object. *K. pneumoniae* has a tendency to form biofilms on biotic and abiotic surfaces, including catheters and other medical devices, which is a contributing factor to their antibiotic resistance (Van Laar *et al*.,2014). Several factors required for biofilms formation have been identified in *K. pneumoniae* clinical isolates from the gastrointestinal tract and in strains that are associated with pneumonia and urinary tract infection (Wu *et al*.,2011).

The bacterial isolates were also tested for serum resistance at an absorbance of 630 nm. The results showed that 15% of *Klebsiella pneumonia,*

**Molecular characterization of *K. pneumoniae* isolates:**

**Detection of *rmpA*, *iss* and *mrkA, htrA* genes:**

four selected genes were investigated in this study to explore their role in the pathogenesis of *Klebsiella pneumoniae* associated diseases. These genes were *iss* gene (4) positive, *mrkA* gene (5) positive, and *htrA* gene (26) positive, *rmpA* gene (17) by PCR technique.

In this study *mrk*A (Mannose resistant *Klebsiella* polypeptide A) gene 862BP five represent positive isolates disagree with ( Nathalie *et al*;2003) Twenty-three (69.7%) of the 33 type strains tested type 3 fimbriae may provide different functions for the bacteria, one enabling a specific receptor-ligand interaction with host cells and tissues and the other facilitating attachment to abiotic surfaces and then outgrowth of the bacteria as an efficient biofilm in several environments. Type 3 fimbriae-dependent adherence may be the first step in *K. pneumoniae* colonization of non-biological surfaces and biofilm development and thus could be a major virulence determinant in nosocomial infections. However, since some highly adherent strains (Nathalie *et al*;2003)

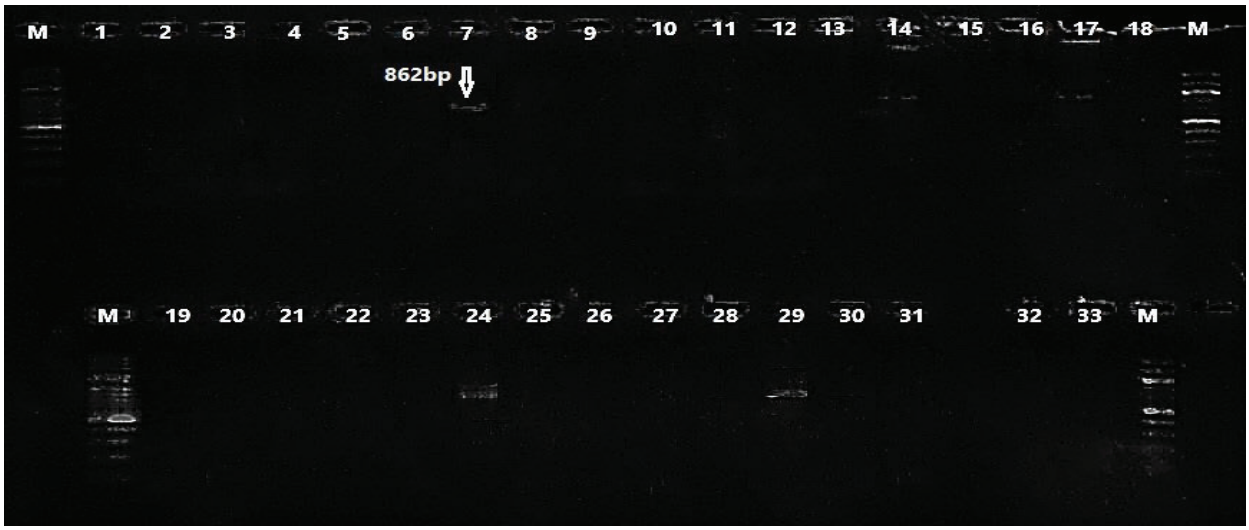


**Figure 1: performed of polymerase chain reaction with mrkA gene of *K. pneumoniae* isolates, 1.5 agarose. 72volts 60 min: M:100bp DNA marker Lane (7,14,17,24,29) Amplified PCR product of *mrk*A gene.**

The presence of *rmp*A gene has been associated with the hypermuscoviscosity phenotype in K. pneumoniae, and was found to be more prevalent in liver abscess strains than in bacteremia isolates (Yu *et al*., 2006).

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It was first reported in 1989 by (Nassif *et al*., 1989) and is the first one explained that remove of the *rmp*A gene can decrease about 1000 fold of virulence in mouse lethality tests, in spite there was a positive relationship between virulent *K. pneumoniae* and the presence of *rmp*A gene, but this gene remained unknown for many years.

The *rmp*A gene is the most frequently occurring ones, the latter being associated with *K. pneumoniae* hypermucoviscosity and high virulence (Chang *et al*.,2013). The *rmpA* gene is located on a 180-kilo base of multi copy plasmid, is a strong virulence plasmid and it has an important role in expressing the mucoid phenotype of *K. pneumoniae* (Suescun *et al*., 2006).

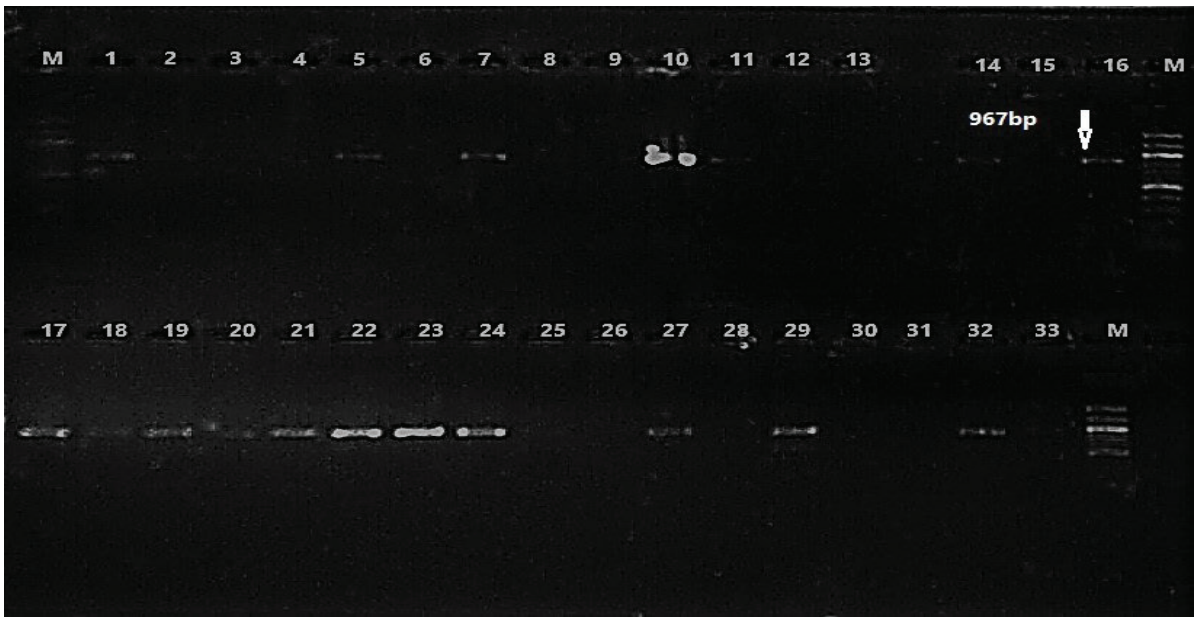


**Figure 2: performed of polymerase chain reaction with rmpA gene of *K. pneumoniae* isolates, 1.5 agarose. 72 volts 60 min: M:100 bp DNA marker Lane (1,5,7,10,14,16,17,18,19,20,21,22,23,24,27,29,32) Amplified PCR product of *rmp*A gene.**

*Htr*A: *htr*A (high temperature requirement A) gene is now of interest because *htr*A mutant strains of several gram-negative bacteria have been shown to be attenuated in animal models and can also be used as vaccines [7]. In this study *htr*A gene1071BP **(**26) represent positive isolates.

Downregulation of bacterial transmigration by *H. pylori htr*A mutations. Polarized monolayers of MKN28 cells were infected by *H. pylori* wild-type or mutant strains. The mutant strains (N6 Δ*htr*A, N6 Δ*htr*A/*htr*AN6 and N6 Δ*htr*A/*htr*AS221AN6 encode the same SecAR837K mutant variant). Transmigrated bacteria were quantified by counting CFUs. All experiments were done in triplicates (Anna Zawilak *et al*.,2019).

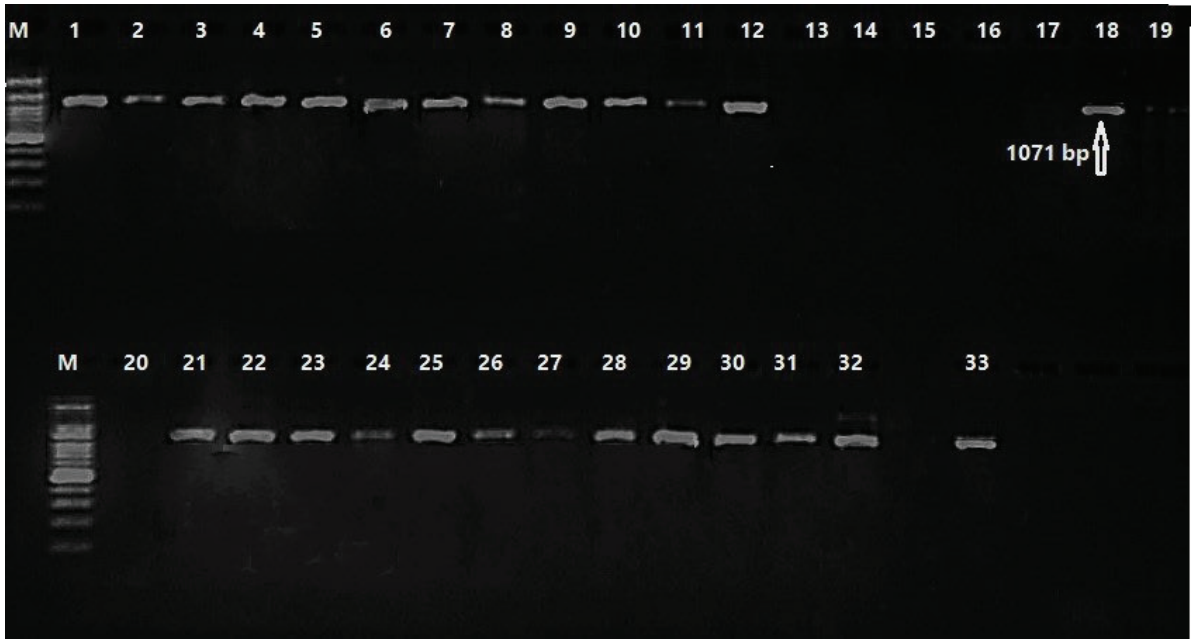


**Figure 3: performed of polymerase chain reaction with hrtA gene of *K. pneumoniae* isolates, 1.5 agarose. 72 volts 60 min: M: 100 bp DNA marker Lane (1,2,3,4,5,6,7,8,9,10,11,12,18,21,22,23,24,25,26,27,28,29,30,31,32,33) Amplified PCR product of *htr*A gene.**

The increased serum survival protein (*iss gene*) has an action in defense to serum complement Nolan, (2003). The *iss* has been known for its activity in virulence of extraintestinal pathogenic *Escherichia coli* strains (ExPEC) Hassan, (2011). The *iss* gene is recognized as one of the most common virulence genes in extraintestinal pathogenic strains in poultry. The occurrence of immune resistance among Enterobacteriaceae family was a cause to study the prevalence of genes associated with serum resistance among Enterobacteriaceae

Among all patients diagnosed with *K. pneumoniae,* Lin *et al.,* (2015). The prevalence of, *htrA*, *rmpA* (42.4%) (21) wound *mrkA* and *iss* genes were (9%), *htrA* (27%) *rmpA* (21%), *mrkA* (21%), *iss* (0%) urine. the total of gene *htrA* (78%), *mrkA* (21%), rmpA (18%) and iss (12%).

The virulence-associated phenotypes including complement resistance, adhesion and invasion, and maintenance within macrophages These results was agreed with several previous studies like that established by Ravichitra *et al*. (2014) and Biradar *et al*. (2015), whose found that K. pneumoniae was the most typical member of Klebsiella spp. Which will cause severe infections.

**Financial Disclosure**: There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Biotechnology and all experiments were carried out in accordance with approved guidelines.

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# Evaluation of Technical Quality and Procedural Errors of Root Canal Treatment Performed by Undergraduate and Postgraduate Dental Students: A Retrospective Radiographic Analysis

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## Abstract

**Aims**: To assess and compare the technical radiographic quality of root canal fillings (RCF) and the occurrence of procedural errors in the endodontic treatment performed by 5th grade undergraduate and postgraduate students in the College of Dentistry/University of Baghdad- Baghdad- Iraq.

**Materials and methods**: Records and periapical radiographs of 216 and 143 root-filled teeth treated by 5th year undergraduate and postgraduate students, respectively during 2018-2019 were collected. Periapical radiographs of 35 (16.2%) and 15 (10.4%) teeth, respectively excluded because of inadequacy in the radiographs. A final total periapical radiographs/records of 181 and 128 root-filled teeth were used to evaluate the technical quality of the root fillings in 197 and 275 root canals treated by 5th year undergraduate and postgraduate students, respectively. Outcome variables categorized as acceptable and not acceptable quality depending on the absence/presence of overfilling, underfilling, voids in the fillings and the absence/presence of ledges, root perforation, transportation, and fractured instruments. Chi-square and 2 sample z tests were used for statistical analysis, significance level set at $\alpha=0.05$

**Results**: Acceptable RCF were in 49.3% and 63.3% of the canals treated by 5th year undergraduate and postgraduate students, respectively with a significant difference between them ($z=2.99$, $p<0.05$). 55.1% and 44.9% of RCF treated by undergraduate students were in anterior and premolars, respectively. 70.9%, 20.7% and 8.4% of RCF treated by postgraduate students were in molars, premolars and anterior teeth, respectively. Significantly more voids, ledges were observed in RCF performed by undergraduate compared to postgraduate students ($z=4.6$ and 2 respectively, $p<0.05$). In contrast, significantly more instrument separations were observed in RCF treated by postgraduate compared to undergraduate students ($z=2.09$, $p<0.05$). However, there was no significant difference in proportions of underfilling, overfilling, perforations, transportation between the two academic levels.

**Conclusion**: Overall technical quality of RCF performed by postgraduates was better than that of 5th year undergraduate students, however, improvement in preclinical and clinical training is needed.

***Keywords:*** *root canal treatment, undergraduate, postgraduate, dental students*

## Introduction

Prognosis of the root canal treatment strongly affected by the technical quality of the coronal restoration and the root canal filling in order to preserve the functionality of the root filled teeth [1]. There are several factors that affect the technical quality of root canal treatment including the density and length of the filling material from the radiographic apex as well as the occurrence of iatrogenic procedural errors that happens during different stages of root canal treatment such as ledge formation, perforations, instrument fractures and transportation [2]. Although, measuring different technical

quality variables of root canal treatment do not measure its outcome, but greater probability of successful outcome associated with good technical quality of the root canal treatments [3]. A study found that the only predicting factor fortooth survival was the technical quality of the root canal filling not the presence of pretreatment periapical pathology [4].

Density of root canal filling (i.e. presence/absence of voids in the filling materials) represent a significant variable in determining the technical quality of root canal filling. It has been reported that unfavorable treatment outcome of root canals is correlated with low dense and non-homogenous root fillings. Also, it was demonstrated that homogenous voids free root fillings are associated with lower risk of post treatment pathology [5,6]. Extent of the length of the root filling materials in the root canal similarly can be correlated with the outcome of the treatment. It has been found that distance of 0-2 mm between the root filling and the radiographic apex is associated with lower risk of post treatment disease than those underfilled (with more than 2mm distance between filling materials and the radiographic apex) [2,7,].

Canal cleaning and shaping can be compromised by incidence of procedural errors that result in inadequate filling of the root canal which risk the prognosis of the treatment [8]. There is always possibility of failure when procedural errors occur during root canal treatment of infected teeth [9]. Perforations of the root can impair the healing process as it is associated with infection of periodontal ligaments and bone [10]. On the other hand, transportation associated with leakage in the root filling and inadequate cleaning of the canal, both may result in apical pathosis persistence [11]. Also, ongoing periapical pathosis after root canal treatment can results frequently after ledge formation because it prevent complete chemomechanical debridement of the canal to the full working length [8]

Many previous epidemiological studies evaluated the technical quality of root canal treatment performed by dental students in different academic institutions with variable results [12,13,14]. However, to authors knowledge, there is no previous study investigated the technical quality and incidence of procedural errors in root canal filled teeth performed by undergraduate and postgraduate students in the College of Dentistry/ University of Baghdad. The aims of the present study are to evaluate and compare the density and length of the root canal fillings and the incidence of procedural errors (perforations, transportation, ledge formation and instrument separation) by reviewing the radiographs of root canal treatments performed by 5th year undergraduate and postgraduate students in the authors' institute.

## Materials and Method

Dental record and periapical radiographs of 216 and 143 teeth received root canal treatment performed by 5th year undergraduate and postgraduate students in the year 2018-2019 in the College of Dentistry/University of Baghdad were collected for analysis of the technical quality and incidence of the procedural errors.

Three periapical radiographs for each tooth including diagnostic, working length estimation and post obturation periapical radiographs were utilized for this purpose. Post obturation PA radiographs that do not provide adequate information because of poor processing or unclear image were exclude from the analysis. Therefore, periapical radiographs and records of a total 309 (181 and 128 teeth root filled by 5th year undergraduate and postgraduate students, respectively) teeth were utilized in this study. Data analysis was based on the number of the filled canals not on the number of teeth, therefore 309 teeth yielded 473 root canal fillings. Radiographs examined with magnification lens (3X magnification) in a dark room under even illumination by two experienced endodontists. All teeth treated by the 5th year undergraduate students were instrumented with step-back technique using stainless steel hand instruments and obturated with gutta-percha and sealer (Zinc Oxide eugenol based), using a cold lateral condensation technique. Teeth treated by the postgraduate students were instrumented with either NiTi rotary instruments or hand instruments and obturated with either cold or hot techniques according to student discretion.

Root canal filling quality classified acceptable if the filling materials end within 0-2 mm from the radiographic apex and there were no voids within the filling materials and no space between the filling material and the canal wall. If the filling materials end shorter than 2 mm from the radiographic apex then the root canal filling classified as underfilled, if the filling materials end beyond the radiographic apex, the root

canal filling classified as overfilled. Both underfilled or overfilled root fillings classified as not acceptable root canal filling. [13,14]

Similarly, evaluation criteria for the procedural errors classified the root canal fillings into acceptable/ not acceptable based on the absence/presence of the followings:

1- Ledges: a ledge was identified in the radiograph if the path of the filling materials deviated from the original curvature of the canal in the working length radiograph.

2- Perforation: a perforation was identified if the filling materials was extruding through the lateral walls of the canal away from the radiographic apex.

3- Transportation: a transportation was identified if the filling materials located on the outside curve of the canal.

4- Instrument separation: an instrument separation was identified if fractured instrument piece was detected in the canal.

Statistical analysis of data performed using Statistical Package for the Social Sciences (Version 24; SPSS Inc., IBM, Chicago, Illinois, USA), descriptive statistics were used to describe the data and inferential statistics included Chi square and two samples z-test for 2 population proportions, significance level set at $\alpha$=0.05

## Results

Total number of acceptable root canal fillings was 272 out of 473 (57.5%) for both academic levels. Acceptable root canal fillings were found in 49.3% and 63.3% of the canals treated by 5$^{th}$ year undergraduate and postgraduate students, respectively with a significant difference between them (z score=2.99, $p<0.05$), as shown in Table 1.

**Table 1: distribution of acceptable and not acceptable root canal fillings among 5th year undergraduate and postgraduate students.**

| Academic level | Acceptable RCF N (%) | Not acceptable RCF N (%) | Total N (%) |
|---|---|---|---|
| 5th year undergraduates | 98 (49.3) a | 100 (51.7%) | 198 (100%) |
| Postgraduates | 174 (63.3) a | 101 (36.7) | 275 (100%) |
| Total N (%) | 272 (57.5%) | 201 (42.5%) | 473 (100%) |

RCF= Root canal fillings, N=number of root canal fillings, %=percentages and identical superscript represent statistical significance among relevant groups.

In root canal treatments performed by 5$^{th}$ year undergraduate, 133 (67.2%) and 65 (32.8%) of root canal fillings were in maxilla and mandible, respectively. Insignificantly, more acceptable root canal fillings occurred in the maxilla (50.4%) compared to the mandible (47.7%) ($p>0.05$). 55.1% and 44.9% of RCF treated by 5$^{th}$ year undergraduate students were in anterior and premolars teeth, respectively, as shown in Table 2. Acceptable root canal fillings were 52.3% and 46.1% in anterior and premolar teeth, respectively, with no significant difference between anterior and premolars ($z=0.8$, $p>0.05$). Procedural errors, voids, underfilling and overfilling in root canal fillings performed by undergraduate students were as follow, perforations were in 2 root canal fillings (1%), ledge was in 3 root canal fillings (1.5%), transportation was in 1 root canal fillings (0.5%), instrument separation was in zero root canal fillings (0%), voids were in 51 root canal fillings (25.7%) and underfilling was in 31 root canal fillings (15.6%) and overfilling was in 24 root canal fillings (12.1%).

**Table 2: distribution of root canal fillings performed by 5th year undergraduate' students in arches according to tooth type.**

| Arch | Anterior | Premolars | Total n(%) |
|---|---|---|---|
| Maxilla n(%) | 92 (46.5%) | 41 (20.7%) | 133 (67.2%) |
| Mandible n(%) | 17 (8.6%) | 48 (24.2%) | 65 (32.8%) |
| Total n(%) | 109 (55.1%) | 89 (44.9%) | 198 (100%) |

n=number of root canal fillings.

In root canal treatments performed by postgraduate students, 53.8% and 46.2% of root canal fillings were in mandible and maxilla, respectively. Insignificantly more acceptable root canal fillings occurred in the mandible (67.6%) compared to the maxilla (58.3%) ($p>0.05$). 70.9%, 20.7% and 8.4% of root canal fillings treated by postgraduate students were in molars, premolars and anterior teeth, respectively, as shown in Table 3. Acceptable root canal fillings were 67.2%, 56.1% and 47.8% in molars, premolars, and anterior teeth, respectively, with no significant difference between molars, anterior and premolars ($z=1.8$ $z= 1.5$, $p>0.05$, respectively). Procedural errors, voids, underfilling and overfilling in root canal fillings performed by postgraduate students were as follow, perforations were in 2 root canal fillings (0.7%), there was no ledge in any root canal filling, transportation was in 1 root canal filling (0.3%), instrument separation were in 6 root canal filling (2.1%), voids were in 27 root canal fillings (9.8%) and both underfilling and overfilling were in 35 root canal fillings (12.7%) each.

**Table 3: distribution of root canal fillings performed by postgraduate students in arches according to tooth type.**

| Arch | Anterior | Premolars | Molars | Total n(%) |
|---|---|---|---|---|
| Maxilla n(%) | 21 (7.6%) | 41 (14.9%) | 65 (23.6%) | 127 (46.2%) |
| Mandible n(%) | 12 (0.7%) | 16 (5.8%) | 130 (47.3%) | 148 (53.8%) |
| Total n(%) | 33 (8.4%) | 57 (20.7%) | 195 (70.9%) | 273 (100%) |

n=number of root canal fillings.

Significantly more voids, ledges were observed in root canal fillings performed by 5th year undergraduate compared to that performed by postgraduate students ($z=4.6$ and 2.0 respectively, $p<0.05$). In contrast, significantly more instrument separations were observed in root canal fillings treated by postgraduate compared to 5th year undergraduate students ($z=2.09$, $p<0.05$). However, there was no significant difference in proportions of underfilling, overfilling, perforations, transportation between 5th year undergraduate and postgraduate students, as shown in Table 4.

**Table 4: Distribution of acceptable and not acceptable (voids, underfilling and overfilling and procedural errors) root canal fillings among 5th year undergraduate and postgraduate students.**

| Academic level | Acceptable root canal fillings | Not Acceptable root canal fillings | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Voids n(%) | Underfilled n(%) | Overfilled n(%) | Ledges n(%) | Perforations n(%) | Transportation n(%) | Instrument separation n(%) |
| 5th year undergraduate | 98 | 51(25.7)a | 31(15.6) | 24(12.1) | 3(1.5)b | 2(1) | 1(0.05) | 0(0)c |
| Postgraduates | 174 | 27(9.8)a | 35(12.7) | 35(12.7) | 0(0)b | 2(0.7) | 1(0.03) | 6(2.1)c |
| Total n* | 272 | 78 | 66 | 59 | 3 | 4 | 2 | 6 |

n= number of root canal fillings. numbers in parenthesis are percentages. identical superscript letters represent significant difference between relevant groups. *some of the canals show two technical problems.

## Discussion

Materials used for this study consisted of dental records and periapical radiographs of teeth received root canal treatment by the 5th undergraduate and postgraduate students. In total 473 root canal fillings were selected in both jaws with no significant difference between the number of root canal treatments performed in the maxilla or in the mandible. In this sample, it was found that postgraduate students treated more root canals in molars than in any other tooth group in comparison to undergraduate students who treated only anterior and premolar.

Previous studies reported different rates of acceptable technical quality of root canal treatments performed by dental students ranging from 23%-74% Our results are within the middle range 57.5% for both academic levels. However, acceptable technical quality of root canal treatment was lower in the treatments performed by the 5th year undergraduate student compared to that performed by the postgraduate students (Table 1), this can be attributed to the greater experience accumulated in the postgraduate students and the use of advanced endodontic tools such as NiTi rotary instruments and developed obturation techniques that help in performing root canal treatments with better technical quality.

Our results show that voids of root canal fillings were numerous among treatments performed by 5th year undergraduate students compared to that performed by postgraduate students (25.7% vs 9.8%) with significant difference between both academic levels (Table 4). This can be attributed to techniques difference in instrumentation and obturation of root canals utilized by both academic levels. Undergraduate use step back and cold lateral condensation techniques for instrumentation/ obturation of root canals compared to using NiTi rotary instruments and thermal compaction by the postgraduate students. It has been reported that cold lateral condensation was associated with more voids compared to thermal compaction (Kierklo et al., 2015). Figures of voids or density problems reported by previous studies evaluated the technical quality of root canal treatment performed by dental undergraduate students were 65.1%, 15% and 7.34% in [13, 14]. Presence of voids can significantly be associated with unfavorable outcome of the treatment and post treatment disease, Denser and more homogenous filling materials associated with better outcome. [5, 6]

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Dentistry and all experiments were carried out in accordance with approved guidelines.

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# Studying the Problems of Attracting Attention in the Physical Education Lesson for the Preparatory Stasge from the Female Teachers Point of View

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## Abstract

The lesson of physical education is more vulnerable to the problems of attracting attention as it is in a wider area and includes freedom of movement and flexibility in dealing in the classroom and sometimes the distraction in the physical education school increases due to the large number of female students, thus providing the opportunity to practice such behavioral problems, since the practice of sports activity, especially the physical education lesson, is appropriate for free behavior and from it turns into an abnormal behavior as a result of being affected by the family circumstances to which the female students belong, Hence the importance of this research shows that the problems of attracting attention If the professors, educators, and researchers do not work with research to determine it, which leads to female students' personal and social maladjustment in and outside the school, then when these problems are left without supervision, it may lead to their increase and the difficulty of dealing with them, In addition to the inability of female students to agree in the school, and therefore, a barrier between them and benefiting from the school's educational and educational services that achieve integrated and balanced growth for all aspects of personality, to qualify them for the right citizenship in line with the goals of society, As for the research methodology, the researcher used the descriptive approach in the survey method to suit the nature of the research problem. As for the research sample, the research community was identified as physical education female teachers in Dhi Qar Governorate for the preparatory stage as shown in table (1) so the number of schools reached (50) schools, while the number Female teachers reached (235) Female teachers. As for the research findings, the most important of them is the scale that was prepared by researchers as a tool to uncover problems of attracting attention in the lesson of physical education for the preparatory stage from the point of view of female teachers. They resort to attract the attention of others With negative behavior.

***Keywords:*** *problems, physical education lesson, preparatory stage, female teachers*

## Introduction

The lesson of physical education is more vulnerable to the problems of attracting attention as it is in a wider area and includes freedom of movement and flexibility in dealing in the classroom and sometimes the distraction in the physical education school increases due to the large number of female students [1], thus providing the opportunity to practice such behavioral problems, since the practice of sports activity, especially the physical education lesson, is appropriate for free behavior and from it turns into an abnormal behavior as a result of being affected by the family circumstances to which the female students belong, And their social and cultural level and the lesson of physical education [2], therefore, attention to behavioral problems is one of the important pillars of education and its importance comes from the fact that education means a change in the behavior of female students towards the best under the influence of conditions, experiences, knowledge and skills that students pass in educational and educational situations, so the impact of education and education is evident In the positive behavior of female students [3], as what appeared to be unwanted behavior among female students was worthy of study and research, Hence the importance of this research shows that the problems of attracting attention If the professors, educators, and researchers do not work with research to determine it,

[4] which leads to female students' personal and social maladjustment in and outside the school, then when these problems are left without supervision, it may lead to their increase and the difficulty of dealing with them, In addition to the inability of female students to agree in the school, and therefore, a barrier between them and benefiting from the school's educational and educational services that achieve integrated and balanced growth for all aspects of personality, to qualify them for the right citizenship in line with the goals of society [5]. Therefore, the two researchers decided to go into this study to find out the reasons that contributed to the existence of these behavioral problems and identify them as a contribution from us in determining these behaviors in an accurate scientific way through building and applying [6] a scale of attention-grabbing problems in the lesson of physical education for the preparatory stage from the viewpoint of female teachers in Dhi Qar Governorate .

**Research methodology and field procedures:**

**Research methodology**

The researchers used the descriptive approach in the survey method to suit the nature of the research problem. "Descriptive research" aims to determine the conditions and relationships that exist between the facts and appearances and the survey method seeks to collect data from community members to try to determine the current state of society in a particular variable or two variables.

**Populations and research sample**

The research community was identified as physical education teachers in Dhi Qar Governorate for the preparatory stage, as shown in Table (1), as the number of schools reached (50) schools, while the number of female teachers reached (235)

**Table (1) Number of female teachers, surveying personnel, and construction and implementation samples**

| | Administrative Unit | Populations | Study sample | ratio | Construction sample | ratio | implementation samples | ratio |
|---|---|---|---|---|---|---|---|---|
| 1 | Nasiriyah | 50 | 2 | | 36 | | 12 | |
| 2 | Shatra | 43 | 1 | | 30 | | 12 | |
| 3 | Gra'af | 40 | 1 | | 21 | | 18 | |
| 4 | Batha'a | 20 | 2 | | 13 | | 5 | |
| 5 | Souq Al-Shouokh | 35 | - | 4.25 % | 18 | 67.5 % | 17 | 45 % |
| 6 | Al-Fadhliyah | 12 | 1 | | 4 | | 7 | |
| 7 | Al-Islah | 15 | 3 | | 7 | | 5 | |
| 8 | Syed Dakhil | 20 | - | | 6 | | 14 | |
| 9 | Total | 235 | 10 | | 135 | | 90 | |

**Devices that used in the research**

- Laptop (Acer)
- Manual calculator (kenko)

**Tools that used in the research**

- Arabic and foreign sources and references.

- International Information Network (Internet) .
- Auxiliary Work Team.
- Pens and pencils.

**Main research procedures**

The researchers prepared a questionnaire to measure the problems of attracting attention in the lesson of physical education for the preparatory stage (for female students) from the viewpoint of female teachers of physical education in a manner appropriate to the scientific foundations from which the subject of its research was launched.

**Final implementation for scale**

The researchers applied a questionnaire to measure attention problems in the physical education lesson on a sample consisting of (90) female teachers of physical education from the research community, and this sample is called (sample application scale) and their percentage reached about (45%) of the parent community, and that was on the corresponding Tuesday 20/2/202.

**Presentation, analysis and discussion of results**

**Display the results of the mea arithmetic mean and standard deviation and the value of the hypothetical mean and the lowest and largest value of answers to the field of Attract attention to the implementation sample and discuss it.**

| Field | Sample | Arithmetic mean | Standard deviation | hypothetical mean | Lowest value | largest value | (t) Value | Significance level | result |
|---|---|---|---|---|---|---|---|---|---|
| Attract attention problems | 90 | 90.544 | 10.798 | 90.544 | 88.282 | 92.806 | 79.545 | 0.000 | moral |

Table (2) Arithmetic mean and standard deviation and the value of the hypothetical mean and the lowest and largest value of answers to the field of Attract attention

In light of the results extracted for the individuals of the research sample in Table (14), it shows the value of the arithmetic mean for the field of attention-attracting problems (90,544) and with a standard deviation (10.798) and the hypothetical mean value was (90,544) while the calculated value of T was (79,545) at the level of significance (0,000) less than (0.05).

This indicates that female students have the desire and need for physical education teachers or their colleagues to accept them and have a special status, through their attempt to attract their forced attention, but some of them fail to achieve this with desired behavior in it, and perhaps we find that female students use verbal or other behavior Verbal to attract the attention of the rest of the students or the school of physical education leaving the motor duties assigned to them and this of course greatly affects the educational and educational goals, so when the student finds an overwhelming pleasure to come up with some movements and behaviors that everyone laughs inevitably, this behavior will affect the time of hers Unless there are efforts made to prevent them to curb such behavior and drive the wheel in the direction previously planned, which made them search for praise and praise with unacceptable behaviors.

Indeed, female students who are unable to achieve standing among others in a socially acceptable way resort to using unacceptable behavioral patterns to attract attention in order to achieve basic personal goals, perhaps the most important of which is related to achieving social status for students among their peers, which enhances their social identity, and gives them the opportunity to impose control, and gain Power and influence, and hence challenge existing power and ultimate immersion in love for adventures.

The researcher stresses that the problems of attracting attention (the search for status) are the main behavioral problems after the aggressive behavior

faced by physical education teachers during the lesson educational institutions with the accompanying methods of silver or material to disturb the system within the lesson, which in turn affects the concept of physical education and its status as an educational system has His goals which seek to improve the general human performance through the chosen sporting activities as an educational mediator characterized by educational and educational characteristics in preparing students for a comprehensive and integrated preparation to be good citizens who benefit themselves and their country.

The researcher believes that such behavior is predominant in the nature of psychological disorder, whose phenomena are kinetic or silvery of an abnormal, it appears that it arises from the imbalance between the tendencies and impulses of students and the adjustment system, and when the adjustment is inappropriate, they resort to compensation in another field for their academic failure, and this What "Suhair Ahmed 2001" referred to by saying: Compensation is the individual's tendency towards another behavior as compensation for behavior that he has failed and failed in order to reduce the tension resulting from the severity of frustration that he is exposed to. Therefore, the behavior of female students becomes aggressive, dispersed and unpredictable, and when the adjustment is very strict, the student tries to stop her behavior continuously and is unable to express herself, therefore, the intervention tactics help female students to develop appropriate control of their tendencies, and the researcher adds that such Such behaviors do not happen by chance or by force, but are the results of past experiences.

**Inferences and recommendations**

In light of the research results and the statistical analysis of data obtained from the behavioral problems scale in the physical education lesson, the researcher reached the following inferences :

- The scale that has been prepared by researchers is a tool for detecting attention-grabbing problems in a physical education lesson for middle school from the teachers' point of view.
- Middle school students at age experience difficulties in proving themselves, so they resort to attracting the attention of others through negative behavior.
- Middle school students seek to compensate for their feelings of dissatisfaction with themselves, a lack of some aspect of their personality, or a lack of self-confidence motivating them to work to attract attention.
- The preparatory stage students do not have the ability to coordinate between the satisfaction of their needs and the requirements of the school environment, forcing them to lead to improper behavior.

**Recommendations**

Use the research tool to measure the problems of attracting attention to the preparatory stage for students to identify the problems that teachers face in implementing physical education lesson activities.

- Overcoming the difficulties and behavioral problems, such as the problems of attracting attention that face prep students, by holding workshops or training courses for psychological counseling.
- Study factors affecting behavioral problems such as methods of socialization, cultural, economic and social level of the family and other factors.
- Using the proposed methods to address behavioral problems in the physical education lesson for primary school students and middle school students.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved and all experiments were carried out in accordance with approved guidelines.

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# Study the Correlation between Serum level of Interlukin 6 and Lactate Dehydrogenase in Myeloma Patients at Stage III with Serum Creatinine and Calcium Level

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## Abstract

Multiple myeloma (MM) still an incurable disease that require better recognition and more research. Many previous studies shown the interaction between myeloma cells and bone marrow stromal cells for the initiation and progression of multiple myeloma . Many chemokines and their receptors including interleukin-6 (IL-6) an play important roles in this interaction. The main purpose of this study is assess the serum level of IL-6 and Lactate dehydrogenase on stage-III of MM patients and healthy controls then Finding the correlation with creatinine and calcium levels. Serum level of IL-6 , Lactate Dehydrogenase , creatinine and calcium levels of (30) MM patients diagnosis at stage –III according to International staging System (ISS) were measurement. The results for these parameters compare with (30) age- and sex-matched healthy controls groups. The results were showed that the mean levels of IL-6 , Lactate dehydrogenase , creatinine and calcium (increased or decreased)high significant ($p \leq 0.001$) when compared with healthy controls . The results of the study suggested the important role of chemokines including IL-6 in the progression of the disease and its relationship with some biochemical parameters , especially in the stage-III of the disease.

***Key Word** : Multiple Myeloma , Interleukin 6 , Lactate Dehydrogenase . stage III*

## Introduction

Myeloma or multiple myeloma (MM) are referred as a cancer of antibody producing cell (plasma cells) which derived from B-cells in the bone marrow [1]. it is a incurable malignant disorder characterized by a multifocal proliferation of clonal, long-lived plasma cells within the bone marrow (BM) and associated skeletal destruction, serum monoclonal gammopathy protien, immune suppression, in addition MM is a debilitating disease with features including hypercalcaemia , renal impairment, anemia and bone disease (summarized in the mnemonic CRAB)) causing a wide variety of complications leading to organ [2] dysfunction and eventually death [3].

IL-6 is a major pro inflammatory a soluble mediator cytokines with a pleiotropic effect on immune response , inflammation and hematopoiesis [4]. When it was detected functions of IL-6 were studied and given several names based on their biological activity. For example, the name B-cell stimulatory factor 2 (BSF-2) was based on the ability IL-6 to induce differentiation of activated B cells into plasma cell ( antibody (Ab)-producing cells , the name hepatocyte-stimulating factor (HSF) on the effect of acute phase protein synthesis on hepatocytes, the name hybridoma growth factor (HGF) on the enhancement of growth of fusion cells between plasma cells and myeloma cells, or the name interferon (IFN)-b2 owing to its IFN antiviral activity [5]. in 1986 Hirano and his Colleagues successful in cloned of BSF-2 c DNA [6], and, it was found that the molecules with different names studied by various research teams were in fact identical, resulting in the single name IL - 6 (Rossi *et al* , 2015). Human IL-6 is made up of 212 amino acids, including a 28-amino-acid signal peptide [4]. The research that dealt with in the biology of MM has shown new insights into the factors that control the growth and survival of myeloma cells. Among the growth factors, interleukin-6 (IL-6) has an essential role where it is involvement in the development of normal plasma cells [7]. also it now

is clear that IL-6 is a potent myeloma cell growth factor involved not only in vitro but also in vivo [8]. Because the essential role of IL-6, it could serve as a target for new therapeutic interventions. Neutralizing the effect of IL-6 may result in a regression of tumor progression [9].

## Subjects and Method

**1-Patients & Healthy** : The study subjects comprised of 30 MM patients( 17 male and 13 female) , age (mean ± SD) = 62.34 ±5.68 (ranging from 45 to 80 years) These patients were suffered from MM diagnosis at stage III according to ISS where the level of Beta2microglobulin ≥ 5.5 mg/L , and were referred to the Hematology Consultation Clinic in each of the teaching hospitals at Baghdad governorate (medical city) , Babil governorate (Marjan city) . Those MM cases then have been diagnosed by a specialized haematologist . Diagnosis was based on bone marrow aspiration, biopsies reports and other diagnostic criteria included complete blood counts (CBC) , serum protein electrophoresis and renal function (urea and creatinine) .. The healthy group included 30 individual (15 male, 15 female) age (mean± S.D) = (55.96 ± 4.7) (range 45 to 60), not suffer from any disease, served as a control group and this group matched with patient group. All subjects in this study were taken consent before participation in this study.

**2-Biomarkers analysis** : Venous blood samples were drawn from patients and control subjects by using disposable syringes . (5) ml of blood was obtained from each subject , pushed slowly into disposable gel containing tubes , allowed to clot at room temperature for 15 minutes and then centrifuged at 3000 rpm for approximately 10-15. minutes , after that sera was obtained and stored at -20˚C until used (Lipppi *et al* ,2007). Quantitative detection of IL-6 in serum was done according to the industrial company (Bioassay Technology Laboratory (China) , that depended on the technique of the quantitative sandwich enzyme immunoassay (ELISA) and Blood chemistry (Lactate dehydrogenase , creatinine and calcium) was assayed in serum using a clinical chemistry analyzer (kit from Shanghai Fosun Long March Medicine and Science co., Ltd.)

## Statistical Analysis

Analysis of data was made by using Statistical Package for Social Science (SPSS) system/ version 23 Results expressed as mean ± Standard division S.D . The analysis of variance (ANOVA),the independent sample T- test, and correlate bivariate were used for this purpose.

## Results

Demographic data and clinical characteristics of MM patients and healthy controls are summarized in Table 1. The mean serum level of IL-6 in stage-III MM patients was 123.57±17.22 ng/L , where it was higher than the mean of controls, which is 58.8± 294.61ng/L , A similar results was observed of biochemical parameters ( Lactate Dehydrogenase , Calcium , creatinine ) record significant rise in MM patients compared with healthy controls figure (1) B, C, D. The mean of all parameters that measured in current study in females patient was higher from male patients . The result of the correlation and linear regression of IL-6 and LDH with calcium and Creatinine are follow: There were significant positive correlations ($p < 0.05$) between IL-6 with calcium and creatinine level also there were positive correlation between LDH with calcium and creatinine Figure (2), (3) respectively.

**Table (1): Demographic data and clinical characters of MM patients (stage III) and healthy controls . Mean ± S.D.**

| **Subjects**<br>**Variables** | **MM patients** | **Healthy controls** |
|---|---|---|
| Age | 62.34 ±5.68 | 55.96 ± 4.7 |
| Gender (male / female) | (17/13) | (15/15) |

***Cont...*** **Table (1): Demographic data and clinical characters of MM patients (stage III) and healthy controls . Mean ± S.D.**

| | | |
|---|---|---|
| RBC counts (106/ml) | 2.514±0.429 | 5.68±8.34 |
| WBC counts(103/ml) | 3.10±0.439 | 9.806±0.814 |
| Platelets count(103/ml) | 188.142±17.43 | 248±35.09 |
| Hb levels (g/dl) | 9.214±0.508 | 12.82±0.944 |
| ESR(mm/hour) | 87.32±9.67 | 18.25±3.34 |
| Albumin(g/L) | 110.571±9.253 | 69.33±2.768 |
| Total protein(g/L) | 27.671±3.055 | 36.106±1.656 |
| Bence Jones protein in urine | (30) positive<br>(0) negative | (0) positive<br>(30) Negative |
| Beta 2 microglobulin (g/L) | 22.56±11.3 | 0.615±0.351 |

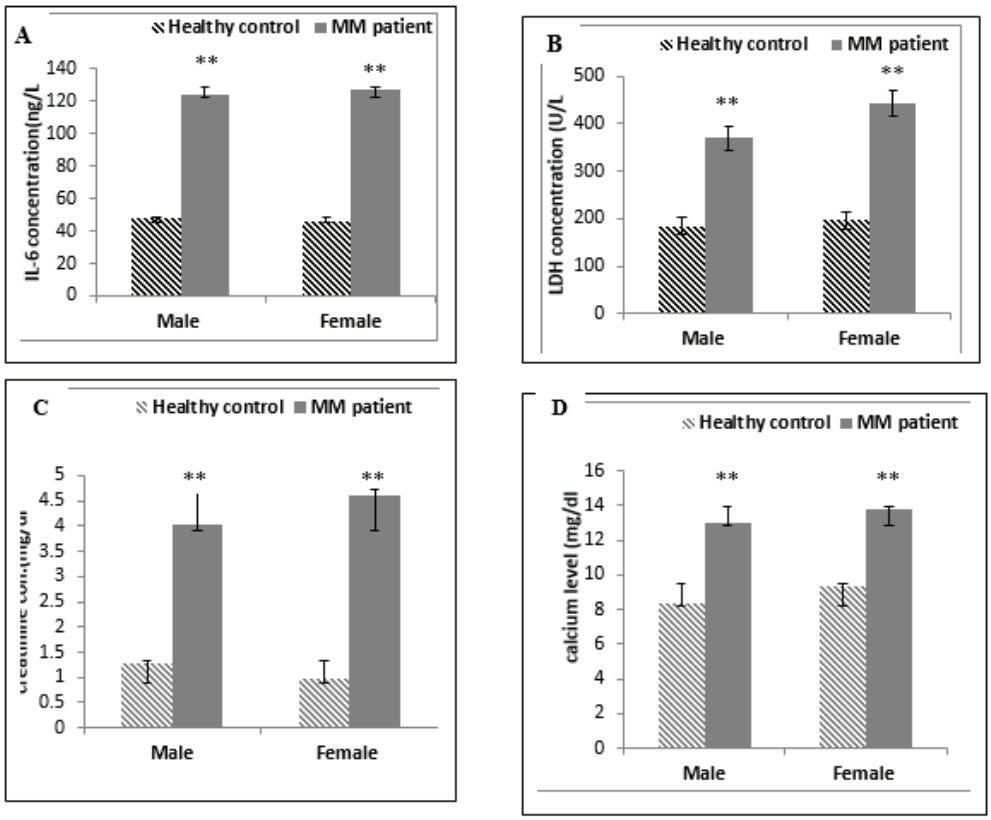


**Figure 1. Comparison of the Mean Level of IL-6 (A) , LDH (B) , creatinine (C) and calcium (D) in the Population of Males and Females MM patients (stage III)and Healthy control . Results showed a significant difference in the mean level in both males and females (**P≤0.01)**

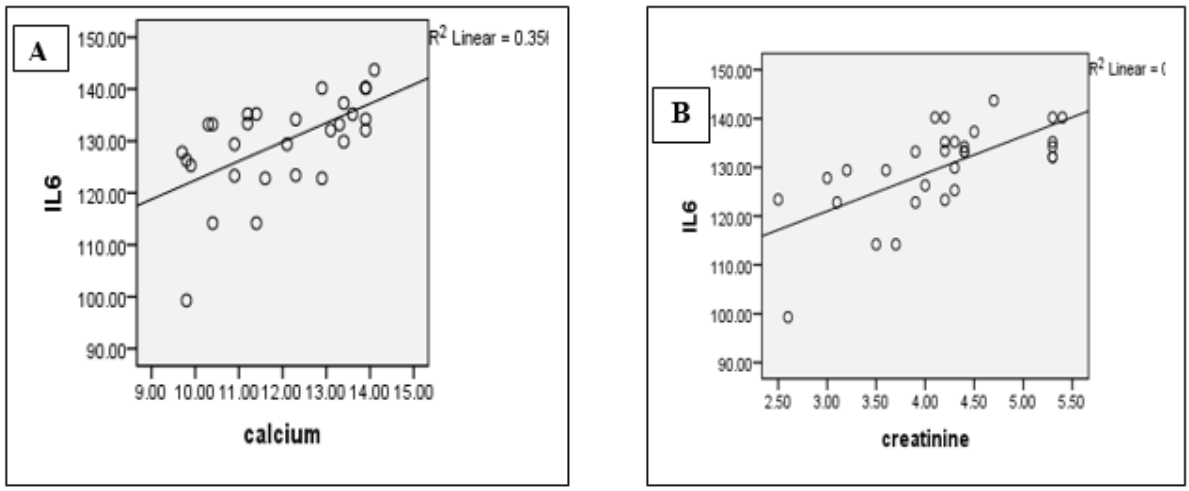


**Figure 2. Correlation between IL-6 and calcium (A) and creatinine (B) in MM patients (stage III) . The results show positive significant correlation of IL-6 with calcium (Pearson's correlation =0.70, P=0.004). and also with creatinine (Pearson's correlation =0.82 , p=0.001)**

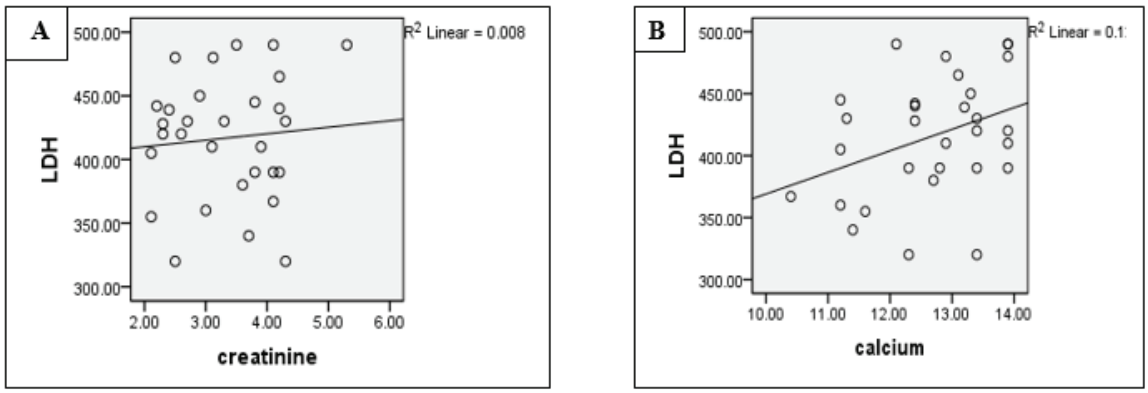


**Figure 3. Correlation between LDH and creatinine (A) and calcium (B) in MM patients (stage III). The results show positive significant correlation of LDH with calcium (Pearson's correlation =0.70, P=0.01) and also with creatinine (Pearson's correlation =0.58, p=0.04**

## Discussion

The pathogenesis of multiple myeloma was complex. The change of the level of cytokines took effect in its occurrence and development the disease [20] . Increased secretion of cytokine by bone marrow stroma often plays a main role in the pathogenesis of some of the clinical signs of multiple myeloma, such as bone disease and renal dysfunction. In our current study, a statistically significant higher level IL-6 was observed in the blood serum of myeloma patients at stage III according to ISS groups as compared to the healthy control group. Many studies have shown that serum levels of IL-6 are elevated in patients with MM and correlate with the severity of the disease as [11] other study as Bataille *et al* (2008) . showed that in patients with stage III MM, based on the Durie and Salmon classification, levels of IL-6 were significantly higher compared to patients with stage I and II disease. In addition, it was noted that elevated levels of IL-6 in serum was a good predictor of the severity of the disease . IL-6 is a pleiotropic cytokine that was originally identified as a T cell-derived lymphokine inducing final maturation of B cells into (plasma cell) antibody-producing cells [18] also has been shown to regulate cell growth and It stimulates the growth of myeloma cells [15]. it has been reported that IL-6-induced lymphoblastoid tumorigenicity due possibly to the inhibitory effect on tumor immunity of very high concentrations of this cytokine [12]. Therefore, it seems possible that IL-6 stimulates the growth of myeloma cells

via autocrine and/or paracrine mechanisms and might contribute to tumor escape from immune surveillance, resulting in disease progression through the increased production of IL-6. Also patients with metastatic renal cell carcinoma have higher serum IL-6 levels than those without disseminated disease [23] . also , Alexandrakis *et al*. (2003) [10] have reported that the levels of cell factors of MM patients such as serum IL-6 and angiogenine were increased significantly. And the increase degree was parallel to clinical staging and severity of diseases. It indicated that the level of IL-6 was concerned with MM progression and the severity. Renal impairment (RI) and osteolytic is one of the most common complications of MM [13] indicates a higher tumor burden and consequently more aggressive disease Heher (2013) . Also In our current work, we found a positive correlation between the level of IL-6 with the level of creatinine and calcium while Singh *et al* , (2015) [22] found elevated in IL-6 in MM patients also there is positive correlation between IL-6 and creatinine level and no correlation between IL-6 with calcium. High levels of LDH are associated with advanced disease and poor survival where our results record significant increase in LDH level in stage III MM patient in addition the result of study Proven presence the positive correlation between LDH with creatinine and calcium level in MM patients. This indicates the progress of the disease where LDH is a cytoplasmic enzyme and may have been observed in nearly all major organ cells. If cells lysis occurs, or cells and membranes are damaged, cytoplasmic enzymes, such as LDH are released into the extracellular area. therefore serum LDH levels are as useful markers like beta-2microglobulin and monoclonal immunoglobulin. During the observation of the patients with MM at stage III, if the LDH levels are abnormally high, the progression of the disease should be considered .

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved and all experiments were carried out in accordance with approved guidelines.

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# Direct Vision Comparison of Lip Curvature between Genders in Fully Edentulous Patients

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## Abstract

Upper lip Curvature is a location of the oral commissure relative to the center of upper lip lower border. The aim of this study was to find the relation between gender and lip curvature. A special tool had been made to help in measurement of lip curvature. There was no significant relation between gender and curvature, however upward group was the highest one followed by straight then downward group.

***Keywords:*** *lip curvature, gender, patients, Direct vision*

## Introduction

Smile of human being is a complex expression, result from combined effect of facial musculature [1]. A smile express itself mainly in oral and eye region [2]. However, lip curvature define as the position of the corners of mouth relative to the center of lower border of upper lip influenced by the age and gender [3-6]. Upper lip curvature can be divided into three categories according to the positioning of the oral commissure relative to the center of the upper lip lower border, Upward when the oral commissure is higher than the center of the upper lip lower border , straight when the oral commissure and the center of the upper lip lower border at the same level and downward when the oral commissure is lower than the center of the upper lip lower border [6,10-12], There are higher rate percentage of expressing downward curvature of their lips in both cuspid and gummy smile , and upward curvature in spontaneous smile [3], however; Upward and straight curvatures are considered more esthetic than the downward curvature 6. In past a study done by Tjan AH, 1984 to evaluate the aesthetic and smile by visual examination. Many investigations for study lip curvature depended on esthetics of smile used a static pictures or direct measurements [4-7]. while in classical mode, photography captures only photos of fixed smile at certain points that made the smile appear unnatural, even during a posed smile [4-5]. With the development of imaging and the emergence of digital imaging, studies conducted with digital photography showed that smile could be achived in more noticeable and less patient interfering way [8,9]. Another research was conducted to determine ways for calcalate dyanimic smile process and for classification spontaneous smile and upper lip curvature in Chinese Han-nationality youths.

## Materials and Method

This study based on the examination of edentulous patient in the prosthodontic department of Babylon university collage of dentistry. The Study had been compared the curvature of lip line between male and female of edentulous patient. The number of the examined patients were 52 patients who divided into two groups (26 male and 26 female), those patients have no any systemic disease and their ages range from 45-65years old.

Group number1: edentulous male patient

Group number2: edentulous female patient

A special device had been constructed in this study that consist of three parallel horizontal rulers connected by two vertical rods; the upper and lower rulers are fixed. The upper part was parallel to the interpapillary line, the middle ruler that can move vertically up and down while the down ruler was parallel to the lower border of upper lip line (figure 4&5). The patient set on dental chair in upright position. The examination done by stabilization the middle ruler on the

Lower border of the upper lip without smile and then asked the patient to smile and said (cheese) to determine the lip curvature.

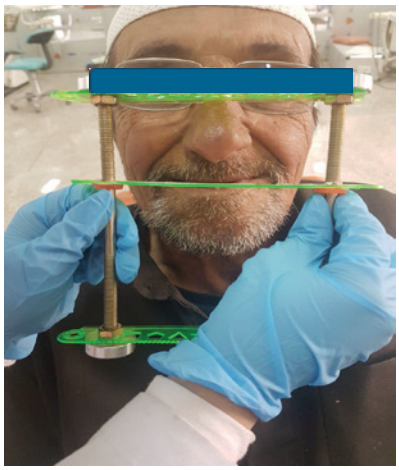

**Fig 1 In this picture the position of corner of the mouth upward to the lower border of the upper lip line during smile when patient say cheese or just smile and take the picture at this moment**

**Fig 2 In this picture the position of the corner of the mouth parallel to the lower border of the upper lip line during smile**

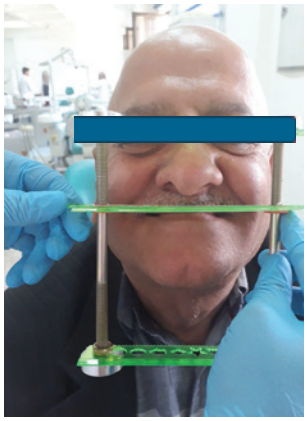

**Fig 3 In this picture the position of the corner of the mouth down to the lower border of the upper lip line during smile**

**However;** The primary results that I had, leading me to develop the previous simple device into more developing and complicated device that will give more precise results and multi-uses purpose.

The purpose of this device is to measure:

1- Midline of face.

2- Lip curvature

3- Comparing the distance of upper 3rd , middle 3d and lower 3rd of face.

Component of device:

1- Upper horizontal ruler must be parallel to interpapillary line

2- Middle horizontal ruler parallel to the lower border of upper lip line

**3- Lower horizontal ruler.**

4- Ruler in midline.

Benefit of device

It help to measure the symmetry of face, lip curvature (upward, straight or downward) and comparing the different parts of face . This idea based on idea of trubyte device that consist of transparent plate, drawn on it eyes, nose and mouth that help to measure the symmetry of face and choosing artificial teeth, however; the trubyte has fixed drawn parts but this device has adjustable ruler that give different measurement special for each patient .

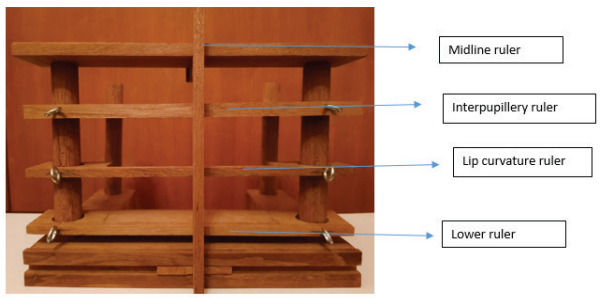


**Fig: modified device.**

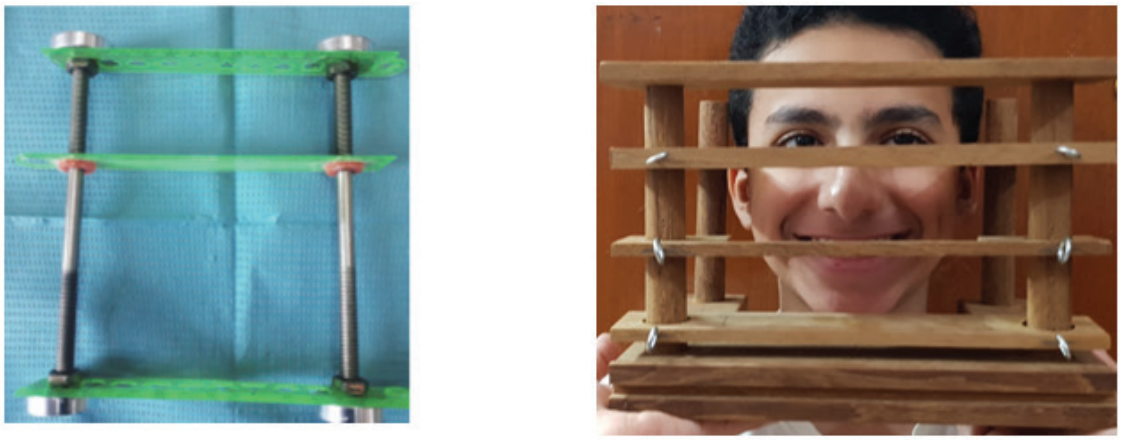

**Fig 4 1st model had been used for lip curvature measurement**

## The Results

In Table 1 reveal relation between the number of male and female. Table 2 reveal the relation between gender Frequencies for upper lip curvature in this study. Figure 5 express the Distribution pattern between types of upper lip curvature in male and female in this study while in Table 3 the Chi-Square Tests showed that there is no significant correction between arc smile & gender.

**Table 1 this table showed the frequency of the number of male and female.**

| Gender | Number |
|---|---|
| Male | 26 |
| female | 26 |

**Table 2 this table showed the frequencies with gender.**

| Gender | Smile arc | | | Total |
|---|---|---|---|---|
| | Upward | Straight | downward | |
| Male | 12 | 6 | 8 | 26 |
| Female | 10 | 8 | 8 | 26 |

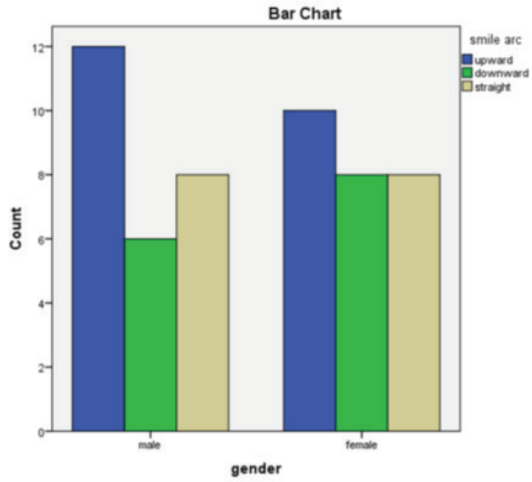


**Figure 5 Distribution of different types of upper lip curvature in male and female in this study.**

| Table 3: Chi-Square Tests that appears there is no significant correction between arc smile & gender. | |
|---|---|
| | Asymp. Sig. (2- sided) |
| **Pearson Chi-Square** | .792 |

## Discussion

Smile is the most complex and sophisticated facial expression, formed from synergic action of facial expression muscles [1]. During smile evaluation and anterior esthetic construction, the anatomic and racial variations should be considered in order to achieve better matching results [1] .

In this study table No.2 & figure 6 the result was the highest number in upward groups followed by straight while the lowest were in downward group of the upper lip curvature, This result disagree with Hulsey 10 that had been found the highest number were in straight group.

In table No. 9 had been found there is no significant relation between arc smile & gender, however; there were no theory agree or disagree with the results of this study.

This result may be probably due to age of patients (45years) who seek for dental consultation immediately after losing of their teeth so this patients maintain the activity of the muscle that it responsible for movement of the lip. This agree with (American orthodontics Samir E. Bishara) which found no significant relation between male and female for age groups (15_ 25 years) and similar trends continued between 25 and 45 years old of age [15].

However with respect to the ageing of soft tissues there is continual decrease in facial skin elasticity and formation of skin folds and wrinkles due to loss of subcutaneous fat hence this decrease the total facial volume [14] .

## Conclusion

In this study, it had been found that there is no significant relation between arc smile & gender; however, the upward groups had the highest number. The reason may return to age or duration loosing of teeth.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the University of Babylon and all experiments were carried out in accordance with approved guidelines.

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# Evaluation of Nurses' Evidence-based Practice at Primary Health Care Centers in Baghdad City

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## Abstract

**Objectives:** The study aims at evaluating the nurses' evidence-based practices at primary health care centers in Baghdad City.

**Methodology:** A descriptive design is carried out at Baghdad City's primary health care centers from January 2en 2019 to June 1st 2020. One instrument is developed for the purpose of the study. A Non-probability, multi-stage purposive sample of (52) staff nurses, who are working at primary health care centers in Baghdad City**.** The instrument is concerned with the evaluation of nurses' evidence-based practices through (43) items which are divided in to five main domains of attitudes, knowledge, beliefs, readiness and applications of evidence-based practices. Content validity of the questionnaire is determined by panel of (10) experts and Internal consistency reliability, Split-half technique, is obtained through Cronbach alpha correlation coefficient. Data are collected through the use of the study instrument and the interview technique as means of data collection. Data are analyzed through the use of descriptive statistical data analysis approach of frequencies, percentages, total scores and ranges.

**Results:** The study findings indicate that the majority of the staff nurses have experienced poor level of knowledge, attitudes, beliefs, readiness and application as dimensions of nurses' evidence-based practices.

**Conclusion:** The study findings depict that staff nurses have experienced inadequate evidence-based practices at primary health care centers.

**Recommendation:** Planned training sessions can be designed, constructed and implemented to staff nurses at the primary health care centers relative to evidence-based practices.

***Keyword:*** *Staff Nurse; Evidence-based Practice; Primary Health Care Centers*

## Introduction

The effect of evidence-based practices (EBP) has reverberated crosswise nursing practice, education, and science. The call for evidence-based quality improvement and healthcare transformation underscores the need for redesigning care that is effective, safe, and efficient. In line with multiple direction-setting recommendations from national experts, nurses have responded to launch initiatives that maximize the valuable contributions that nurses have made, can make, and will make, to fully deliver on the promise of EBP. Such initiatives include practice adoption; education and curricular realignment; model and theory development; scientific engagement in the new fields of research; and development of a national research network to study improvement [(1)].

Evidence-based nursing care is informed by research findings, clinical expertise, and patients' values, and its use can improve patients' outcomes. Use of research evidence in clinical practice is an expected standard of practice for nurses and health care organizations, but numerous barriers exist that create a gap between new knowledge and implementation of that knowledge to improve patient care. To help close that gap, the American Association of Critical-Care Nurses has developed many resources for clinicians, including practice alerts and a hierarchal rating system for levels of evidence. Using

the levels of evidence, nurses can determine the strength of research studies, assess the findings, and evaluate the evidence for potential implementation into best practice. Evidence-based nursing care is a lifelong approach to clinical decision making and excellence in practice [2].

The nursing research pyramid, or nursing research hierarchy of evidence, provides a visual and systematic depiction of forms of research from the least reliable (base) to the most reliable (apex). The pyramid includes both qualitative and quantitative paradigms. Pyramids vary slightly from source to source which can be confusing. To further add to the varying hierarchies "there is currently no universally agreed upon hierarchy of evidence for study types that seek to answer questions about patient's experiences and concerns [3].

## Methodology

A descriptive design, using evaluation approach, is carried throughout the present study to evaluate the evidence-based practices in primary health care centers for the period of January 2nd 2019 to June 1st 2020.

The present study is conducted on (20) primary health care centers which are distributed as (5) main and (5) family medicine at Al-Russafa Health Directorate in Baghdad City and (5) main and (5) family medicine at Al-Karkh Health Directorate in Baghdad City.

A Non-probability, multi-stage purposive sample of (52) staff nurses who are working at primary health care centers in Baghdad. These nurses are selected based on the following criteria:

1. Staff nurses, of all nursing educational background, who are working at the primary health care centers.

2. Staff nurses of both genders.

A questionnaire is developed for the purpose of the study. It is presented as follows [4]:

**Part I: Socio-Demographic Characteristics:** Such characteristics include age, gender, education and years of employment.

**Part II: Evaluation of Nurses' Evidence-Based Practices:** It is comprised of (46) item that measure staff nurses' knowledge, attitudes, beliefs, readiness and application of evidence-based practices.

A pilot study is conducted for the determination of the questionnaires' internal consistency reliability and content validity for the period of 15th January 2019 to 25th February 2019. Content validity of questionnaire is determined by panel of (10) experts. Internal consistency reliability, Split-half technique, is employed for the Nurses' Evidence- based questionnaire. Cronbach alpha correlation coefficient is computed on responses of (10) staff nurses and it indicates that (r= 0.86) which is adequate.

Data are collected through the use of the study questionnaires as means of data collection. Each interview takes approximately (5-10) minutes to be completed.

The data are analyzed through the use of descriptive statistical data analysis approach of frequencies, percentages, total scores and ranges.

## Results

**Table (1): Overall Evaluation of Dimensions of Staff Nurses' Evidence-based Practices**

| List | Overall Evaluation | | |
|---|---|---|---|
| | Scale | F | % |
| 1 | Poor (44-68) | 50 | 96.15 |
| 2 | Fair (69-93) | 2 | 3.846 |
| 3 | Good (94-118) | 0 | 0 |
| | Total | 52 | 100% |

Results out of this table indicate that the majority of the nurses have poor level of overall evaluation of the dimensions of nurses' evidence-based practices (96.15%).

**Table (2): Evaluation of Nurses' Knowledge as Dimension of Evidence-based Practices**

| List | Knowledge | | |
|---|---|---|---|
| | Scale | F | % |
| | Poor (14-18) | 47 | 90.38 |
| 2 | Fair (19-23) | 3 | 5.769 |
| 3 | Good (24-28) | 2 | 3.846 |
| | Total | 52 | 100 |

Results out of this table reveal the majority of the nurses have poor level of knowledge evaluation as dimensions of nurses' evidence-based practices (90.38%).

**Table (3): Evaluation of Staff Nurses' Attitudes as Dimension of Evidence-based Practices**

| List | Attitudes | | |
|---|---|---|---|
| | Scale | F | % |
| 1 | Poor ( 4-6 ) | 45 | 86.54 |
| 2 | Fair ( 7-9 ) | 6 | 11.54 |
| 3 | Good ( 10-12 ) | 1 | 1.923 |
| | Total | 52 | 100 |

Results out of this table show the majority of the nurses have poor level of attitudes evaluation as dimensions of nurses' evidence-based practices (86.54%).

**Table (4): Evaluation of Staff Nurses' beliefs as Dimension of Evidence-based Practices**

| List | Beliefs | | |
|---|---|---|---|
| | Scale | F | |
| 1 | Poor ( 14-23 ) | 50 | 96.15 |
| 2 | Fair ( 24-32 ) | 2 | 3.846 |
| 3 | Good ( 33-42 ) | 0 | 0 |
| | Total | 52 | 100 |

Results out of this table indicate the majority of the nurses have poor level of beliefs evaluation as dimensions of nurses' evidence-based practices (96.15%).

**Table (5): Evaluation of Staff Nurses' Readiness as Dimension of Evidence- based Practices**

| List | Readiness | | |
|---|---|---|---|
| | **Scale** | **F** | |
| 1 | Poor ( 7-11 ) | 50 | 96.15 |
| 2 | Fair ( 12-16 ) | 2 | 3.846 |
| 3 | Good ( 17-21 ) | 0 | 0 |
| | Total | 52 | 100 |

Result out of this table present the majority of the nurses have poor level of readiness evaluation as dimensions of nurses' evidence-based practices (96.15%).

**Table (6): Evaluation of Staff Nurses' Application as Dimension of Evidence-Based Practices**

| List | Application | | |
|---|---|---|---|
| | **Scale** | **F** | **%** |
| 1 | Poor ( 5-8 ) | 49 | 94.23 |
| 2 | Fair ( 9-11) | 3 | 5.769 |
| 3 | Good (12-15 ) | 0 | 0 |
| | Total | 52 | 100 |

Results out of this table depict the majority of the nurses have poor level of application evaluation as dimensions of nurses' evidence-based practices (94.23%).

## Discussion

### 1. Overall evaluation

Analysis of overall evaluation of such practices reveals that most of staff nurses have poor level of evidence-based practices (Table 1). This finding provides evidence that such poor level of evidence-based practices has emerged due to their insufficient background and training relative to this issue.

A cross-sectional study aimed at measure the evidence-based practice beliefs and implementation among Saudi nursing students enrolled in the bridge program, and also sought to identify the factors that influence evidence-based practice beliefs and implementation. A convenience sample of (188) nursing bridge program students at Saudi university is selected. The findings of the study depict that very low overall mean score of (22.57) is reported by the respondent in the implementation of evidence-based practice [(5)].

### 2. Evaluation of Staff Nurses' Knowledge

Analysis of such evaluation depicts that most of staff nurses have poor level of knowledge about evidence-based practices (Table 2). Such finding presents evidence that these staff nurses do not pursue sufficient knowledge about this issue.

A quasi-experimental study conducted to determine the effect of an educational program on nursing interns' EBP attitudes, knowledge and skills. A convenience sample of (40) nursing interns is selected. The finding of the study indicates that less than half of the study subjects have fair level of knowledge about EBP in the pretest. However, in the post test, the majority of the study subjects have good level knowledge about EBP after implementing the program [(6)].

### 3. Evaluation of Staff Nurses' Attitudes

Analysis of such evaluation indicates that most of

staff nurses have poor level of attitudes (Table 3). This finding can be interpreted in a way that these nurses are not well oriented toward the issue of evidence- based practices.

A quasi-experimental study is carried out to determine the effect of an educational program on nursing interns' EBP attitudes, knowledge and skills. A convenience sample of (40) nursing interns is selected. The finding of the study depicts that the majority of the study subjects have positive attitudes toward EBP post the program execution [6].

3. **Evaluation of Staff Nurses' Beliefs**

Analysis of such evaluation presents that most of nurses have poor level of beliefs (Table 4). This can be interpreted in a way that staff nurses have experienced lack of beliefs concerning the evidence- based practices.

A descriptive comparative design conducted. A sample of (185) nurses is selected to evaluate EPB belief and implementation. The finding of the study depicts that the nurses have positive beliefs toward EBP, but only practiced it to a small extend. There is a positive correlation between beliefs towards evidence-based practice and implementation of evidence-based practice ($r=0.59$, $p=0.001$) [7].

4. **Evaluation of Staff Nurses' Readiness**

Analysis of such evaluation depicts that most of nurses have poor level of readiness (Table 5). This can be interpreted in a manner that the nurses have no readiness towards evidence-based practices.

A cross-sectional survey conducted to evaluate safety climate and readiness for implementation of evidence and person centered practice. A sample of (726) nurses who work at surgical words in Swedish university hospitals is selected. The finding of the study reveals that the safety climate is positively related to readiness for evidence-based and person centered care [8].

5. **Evaluation of Staff Nurses' Application**

Analysis of such evaluation indicates that most of staff nurses have poor level of application of evidence-based practices (Table 6). This can be interpreted in a way that these nurses have no ability to easily apply the evidence-based practices.

A cross-sectional study conducted on Quota "non-probability" sample of (220) nurses who work at teaching hospital in Kuala Lumpur is selected to assessment attitudes towards knowledge for nurses who are use EBP. The finding of the study indicates that the application of EBP in clinical setting increase the quality of patient care. Clients' outcome and nurses' job satisfaction and retention, nursing managers and authorities have an important role in providing supports [9].

## Conclusion

**1.** The majority of the staff nurses have misplaced the opportunity to be involved in training sessions on evidence-based practices. So, their performance has been adversely influenced.

**2.** The study findings depict that staff nurses have experienced inadequate evidence-based practices at primary health care centers.

**3.** Few staff nurses have readiness to apply evidence-based practices, but unfortunately they experience lack of orientation on how to seek it.

**4.** Primary health care centers nurses thought that the evidence-based practices require time frame and resources.

## Recommendations

1. Planned training sessions can be designed, constructed and implemented to staff nurses at the primary health care centers relative to evidence-based practices.

2. Staff nurses can be encouraged and supported to be engaged in special training sessions about evidence-based practices.

3. Nursing Curriculums can encompass courses that address issues related to evidence-based practice.

4. The Evidence-based practices' policies can be activated and developed by the health authority in the Ministry of Health and Environment.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Ministry of Health and Environment and all experiments were carried out in accordance with approved guidelines.

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# The Effect of Competitive Antigen on Some Cytokine in Rabbits

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## Abstract

Bacterin can be divided into dead bacterin and live bacterin. Dead bacterin is a virulent strains which have a good immunogenicity .the aim of this study to know competitive between two bacterin *E.coli* and *P.aeruginosa* in different concentrations .The rabbits were used as model for this study and the rabbits were divided into six groups each groups composed 5 rabbits , After immunized programs .the blood were collected . The sera were separated and used to determine TNF-α ,IL-2 and IL-10 by enzyme linked immunosorbent assay .the results appeared .The results appeared different count of bacteria increased (54.09, 68.33)TNF-α compared with control(42.55) . the concentrations of Il-2 were increased with increased dose of *E .coli* (16.90, 20.29)also the same occurred with *P .aeruginosa* (in *P aeruginosa* alone was15.14 while combined with *E.coli* 15.56 and15.38 ,the results appeared the means of IL-2 concentrations were higher, Interleukin 10 were showed its mean was increased in same concentrations of bacterin but decreased in different count . The present findings seems to be novel since combined bacterins have the potential for use as an autogenous bacterins in therapy for cases of complicated multi-drug resistant infections like that of urinary tract.

***Keywords:*** *Competitive antigen, Cytokine, Rabbits, Effect*

## Introduction

Antigenic competition occurs as a result of competition for the limited number of immune cells with multiple capabilities already present and, on the other hand, Humoral theory believed humoral [1] factors were responsible for antigenic competition and states: (Antigenic competition occurs as a result of competition for the limited amount of basic humoral factors in the immune response [1]. combination vaccines are composed of two or more antigens in same preperation. This method has been used in many vaccines like DTwP and MMR for over 50 years. Combination products ease the administration of vaccines and facilitate the introduction of new vaccines without requiring additional visits and injections from the health clinic.

Possible benefits of the combined vaccines include:

- Reducing the cost of storage and administration of individual vaccines
- Reducing costs for additional visits to hospitals,
- More cost-effective in vaccine delivery
- Increase immunization safety by decrease the number of needles and syringes needed
- Improving the timeliness of vaccination (some parents and health care providers object to more than two or three injectable vaccinations being given during a single visit due to a child's fear of needles and pain and safety concerns);
- Facilitating the addition of new vaccines to programmes of immunization.

The production of combination vaccines for multiple disease protection began with the combining of individual vaccines for diphtheria, tetanus, and pertussis (DTP) into one single product, this combination vaccine was first used in 1948 to vaccinate children and infants [2]. It has become the fundamental of adult and pediatric immunization, over the years, has strengthened its reactogenicity profile by adding other vaccines to the mix and removing components.

Cytokines are small secreted proteins (<40 kDa), which are produced by nearly every cell to regulate and influence immune response [3]. The release of pro-inflammatory cytokines will lead to activation of immune cells and production as well as the release of further cytokines [4]

Heat-killed *Brucella abortus* promotes secretion of Th1-inducing cytokines such as interleukin-12 (IL-12) and IFN-γ and has been used as a carrier to induce Th1 responses to vaccines. To explore which bacterial constituents could mediate this response and how it is regulated, murine spleen cells were cultured with *B. abortus* derived DNA, lipopolysaccharide (LPS), or whole killed organismsheat-killed *Brucella abortus*can also be used to stimulate Th1-like responses in mice [5]. The aim of this study to determine the effect of two killed bacterial antigen on TNF-alpha ,IL-10 and IL-2 concentrations in rabbits.

## Material and method

### Preparation of Whole Heat Killed Antigen

*Escherichia coli* and *Pseudomonas aeruginosa* isolates were obtained from Urinary tract infection patients and confirmed diagnosis of bacteria was done according to [6].

The heat-killed total antigen was prepared for both bacteria when grown in a complete culture medium (mean in the heart and brain infusion broth) or a lower culture medium according to [7] as follows:

1) *E. coli* and *P. aeruginosae* are grown in 100 ml conical flasks, in which 50 ml of the culture medium are placed and the implants are incubated in a Shaker Water Path vibrating bath at a temperature of 37 ° C and its tremors adjusted at a rate of 60 shake / minute and for 18 hr.

2) Discard growths are discarded at 5,000 rev / min for 15 mints, leaving the clearance and the precipitate taken.

3) The precipitate is suspended by a fixed volume of normal saline &treated at 60 ° C for one hour in the water bath, the precipitate is taken and the clearance is left.

4) The precipitate was washed with functional saline and of the same original size, two washings at 5000 rpm for 10 min.

5) Calculate by opacity tube, the equivalent of 5 and 10 international units (by comparing the concentration of the prepared antigens with the concentration of the aforementioned tube by relying on the same degree of opacity when observed in kind).

6) It is ensured that these prepared antigens are free of bacteria that have not been killed after being treated with heat as mentioned above, where a carrier campaign taken from these antigens is grown on the feeding nest center and incubates at a temperature of 37 ° C for 18-24 hr. and then the growth of the colonies is observed or not. After the incubation period ends

The Immunization programs

Different concentrations & mixtures of *E. coli & P. aeruginosae*Whole Heat Killed Antigens were used to immunize animal groups(table 1)

**Table (1): Experimental animal groups**

| Groups | Immunization antigens | Animals number | Describe |
|---|---|---|---|
| 1 | *Ec1.5*10$^8$* | 5 | Injection by Only 1.5*10$^8$ IUs of *Ec* are considered to be positive control |
| 2 | *Pa1.5*10$^8$* | 5 | Injection by Only 1.5*10$^8$ IUs of *Pa* are considered to be positive control |
| 3 | *Ec1.5*10$^8$+ Pa1.5*10$^8$* | 5 | injection with equal concentration mixture from *Ec* and *Pa* antigens (1.5*10$^8$ IUs of each antigen) |

***Cont...*** **Table (1): Experimental animal groups**

| | | | |
|---|---|---|---|
| 4 | *Ec*3*10$^{16}$+*Pa*3*10$^{16}$ | 5 | injection with equal concentration mixture from *Ec* and *Pa* antigens (3*10$^{16}$IUs of each antigen) |
| 5 | *Ec1.5*10$^{8}$*+*Pa*3*10$^{16}$ | 5 | injection with antigen mixture contain1.5*10$^{8}$ IUs of *Ec* and 3*10$^{16}$ IUs of*Pa* antigens |
| 6 | *Ec*3*10$^{16}$+*Pa1.5*10$^{8}$* | 5 | injection with antigen mixture contain 3*10$^{16}$ IUs of *Ec* and 1.5*10$^{8}$ IUs of *Pa* antigens |
| 7 | Normal saline | 5 | Injection with salt solution is considered to be negative control animals |

**EC*: E.coli* antigen Pa: *P. aeruginosa***antigen **U:Internationalunit**

**Blood samples**

By using disposable syringe, Five ml of blood were withdrawn from heart of the rabbits in a way of stab heart ( heart puncture), two ml of the samples of blood were placed in EDTA tubes as anticoagulant, while threeml of the samples of blood were placed in test tubes without anticoagulant and it was left at room temperature till being clotted, and then was centrifuged at 2500 rpm for 5 minutes, after centrifugation the serum was separated from the blood using sterilized pasture pipette, then the serum was divided into 0.5 ml and placed in sterilized Eppendorf tube (Frei*et al*.,1995) and stored at freezing till testing time.

**IL2,IL10,TNF Alpha**

The test was used for serum of rabbits immunized with *E.coli* and *P. aeruginosa*e.Bacteria in in different combination to determine the concentration of IL2, IL10, TNF Alpha . This test was achieved according to the manufacturing company (Bioassay Technology Laboratory) as follows:

1- All reagents were prepared, standard solutions and samples as instructed. All reagents brought to room temperature before use. The assay was performed at room temperature.

2- The number of strips required for the assay were determined. The strips was inserted in the frames for used .

3- Fifty µl added from standard well.

4- Forty µl sample was added to sample wells and then added 10µl anti-IL-2 or anti-IL-10 anti-TNF Alpha (according to kit used) antibody to sample wells, then added 50µl streptavidin-HRP to sample wells and standard wells(Not blank control well). Well was mixed . The plate was covered with a sealer. Then it incubated for 60 minutes at 3$^{7o}$C

5- The sealer was removed and washed the plate 5 times with wash buffer. wells was soaked with at least 0.35 ml wash buffer for 30 seconds to 1 minute for each wash. For automated washing, aspirate all wells and wash 5 times with wash buffer, overfilling wells with wash buffer. Blot the plate onto paper towels or other absorbent material.

6- Fifty µl substrate solution A was added to each well and then added 50µl substrate B to each well. plate covered with a new sealer and incubated for 10 minutes at 37$^{o}$C in the dark.

7- Fifty µl Stop solution was added to each well, the blue color would change into yellow immediately.

8- The optical density(OD value) was determined for each well immediately using a microplate reader set to 450 nm within ten minutes after adding the stop solution.

## Statistical Analysis

Data were processed and analyzed with oneway ANOVA using statistical program social (SPSS 23) and the results were expressed as (Mean± S.D). P-values below 0.05 were considered to be statistically

significant[8].

## The Results and Discussion

IL-2, IL-10and TNF-Alpha cytokines were estimated by using Enzyme Linked Immunosorbent assay (ELISA) were used for quantification of rabbit IL-2, IL-10, and TNF-Alpha the result of this test were calculated by using standard curve fit equation in ELISA system instrument . The Means of TNF-Alpha in sera of rabbit immunized with antigen(different antigen) .Its mean in Groups that immunized with *E.coli* alone was 50while significantly decreased when combined with *P .aeruginosa* at1.5*10 was 29.24 while increased when combined in different count of bacteria was 54.09 .In Groups of rabbits that immunized with *P .aeruginosa* alone its mean was35.49 while significantly decreased when combined with same count of *E.coli* 34.01 but its increased significantly when combined with different count of *E .coli* it was 68.33 .The results appeared different count of bacteria increased (54.09, 68.33)TNF-α compared with control(42.55) . The cytokine tumor necrosis factor-α (TNF-α) functions as an endogenous alarm signal that coordinates gene expression and cellular activity, driving inflammatory responses to infection, injury, or irritation. In addition to stimulating host cell responses, the results appeared TNF-α in E.coli was higher than control while opposite with P.aeruginosa this agree with Lee and coworkers (2003) studied the in vitro and in vivo effects of TNF- on two gram-negative bacteria that cause pneumonia in patients with compromised host defenses ,*Escherichia coli* and *Pseudomonas aeruginosa* .*E. coli* responded to recombinant soluble TNF-with increased growth in vitro. This effect of TNF-on bacterial growth was dose-dependent and inhibited by blocking antibodies against TNF-. In contrast, the in vitro growth of *P. aeruginosa* was not affected by either TNF-or anti–TNF-α antibodies. That is, recombinant TNF- α in vitro stimulated the growth of *E. coli* but not *P. aeruginosa.*

**Table(2): The means of TNF-Alpha in serum samples of Rabbits Groups Immunized with Different Types of Antigens**

| NO. | Groups of rabbits immunized with whole killed antigen | Mean ± SD | P value |
|---|---|---|---|
| 1 | E .coli 1.5*108 | 50.00±9.37 | 0.000 |
| 2 | P. aeruginosa 1.5*108 | 35.49±3.05 | |
| 3 | E.coli(1.5*108)+P.aeruginosa(1.5*108) | 29.24±1.12 | |
| 4 | E.coli(3*1016)+ p. aeruginosa(3*1016) | 34.01±7.58 | |
| 5 | E.coli(1.5*108)+ p. aeruginosa(3*1016) | 54.09±10.71 | |
| 6 | E.coli(3*1016)+ p. aeruginosa(1.5*108) | 68.33±22.36 | |
| 7 | Control | 42.55±13.07 | |

The Means of IL-2in sera of rabbit immunized with antigen in table 3. *E. coli* alone was 10.18 while when combined with *P .aeruginosa* the concentrations of IL-2 were significantly increased .The results appeared the concentrations of Il-2 were increased with increased dose of *E .coli* (16.90, 20.29)also the same occurred with *P .aeruginosa* (in *P aeruginosa* alone was15.14 while combined with *E.coli* 15.56 and15.38 ,the results appeared the means of IL-2 concentrations were higher significantly compared with alone bacteria .

**Table (3): The means of IL-2 in serum samples of Rabbits Groups Immunized with Different Types of Antigens**

| NO. | Groups of rabbits immunized with whole killed antigen | Mean ± SD | P value |
|---|---|---|---|
| 1 | E.coli1.5*108 | 10.18±0.55 | 0.001 |
| 2 | P. aeruginosa 1.5*108 | 15.14±0.78 | |
| 3 | E.coli1.5*108+P.aeruginosa1.5*108 | 16.90±4.60 | |
| 4 | E.coli 3*1016+ P. aeruginosa 3*1016 | 20.29±3.59 | |
| 5 | E.coli 1.5*108+ P. aeruginosa3*101 6 | 15.56±1.99 | |
| 6 | E.coli3*1016+ P. aeruginosa1.5*108 | 15.38±1.22 | |
| 7 | Control | 18.67±5.37 | |

* significant at p≥0.05

The Means of IL-10in sera of rabbit immunized with antigen(different antigen) ranged between (266.00-391.91) while control 293.96 .In rabbits that immunized with E.coli alone the concentrations of IL-10 was385.52while when Its concentrations(358.16) were significantly decreased combined with *P aeruginosa* $1.5*10^{8}$ but increased(391.91) with $3*10^{16}$ .In groups that immunized with *P. aeruginosa* alone its mean concentrations was 391.91while its concentrations significantly decreased 266.00 and 281.85 (Table 4). The results were showed increased in same concentrations of bacteria but decreased in different concentrations its mean was

**Table (4): The means of IL-10 in serum samples of Rabbits Groups Immunized with Different Types of Antigens**

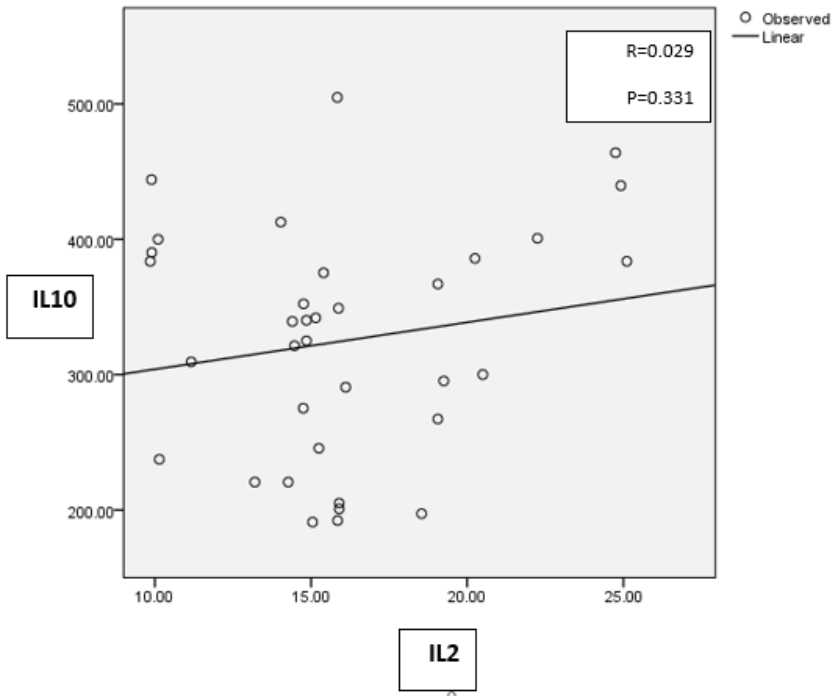
| NO. | Groups of rabbits immunized with whole killed antigen | Mean ± SD | P value |
|---|---|---|---|
| 1 | E.coli(1.5*108) | 385.52±48.59 | 0.060 |
| 2 | P. aeruginosa (1.5*108) | 296.57±95.60 | |
| 3 | E.coli(1.5*108)+P.aeruginosa(1.5*108) | 358.16±20.37 | |
| 4 | E.coli(3*1016)+ p. aeruginosa(3*1016) | 391.91±45.87 | |
| 5 | E.coli(1.5*108)+ p. aeruginosa(3*1016) | 266.00±37.52 | |
| 6 | E.coli(3*1016)+ p. aeruginosa(1.5*108) | 281.85±130.54 | |
| 7 | Control | 293.96±91.96 | |

***not significant at p≥0.05**

The results showed combined bacterial effect on cytokine concentrations this disagree with9( Kashiwagi,2014 )in these study cytokine production was investigated in peripheral blood mononuclear cells (PBMCs) cultures stimulated with diphtheria and tetanus toxoids combined with acellular pertussis vaccine (DPT), Hib, and PCV7separately or

concurrent different combinations, No significant difference was observed in cytokine levels of IL-1β, IL-4, IL-6, IL-10, IL-12, IFN-γ, MIP-1, TNF-α, and prostaglandin E2 (PGE2) in sera between the two groups .

Correlation between IL-10 and IL-2waspositive correlation and p value was not significant at p<0.05 Show in figure (1) , Correlation between IL-10 and TNF-Alpha was positive correlation and P value was not significant at p<0.05 show in figure (2). Correlation between IL-2 and TNF-Alpha was positive correlation and P value was not significant at p<0.05




**Figure(1) correlation between IL-10 and IL-2(Positive)**

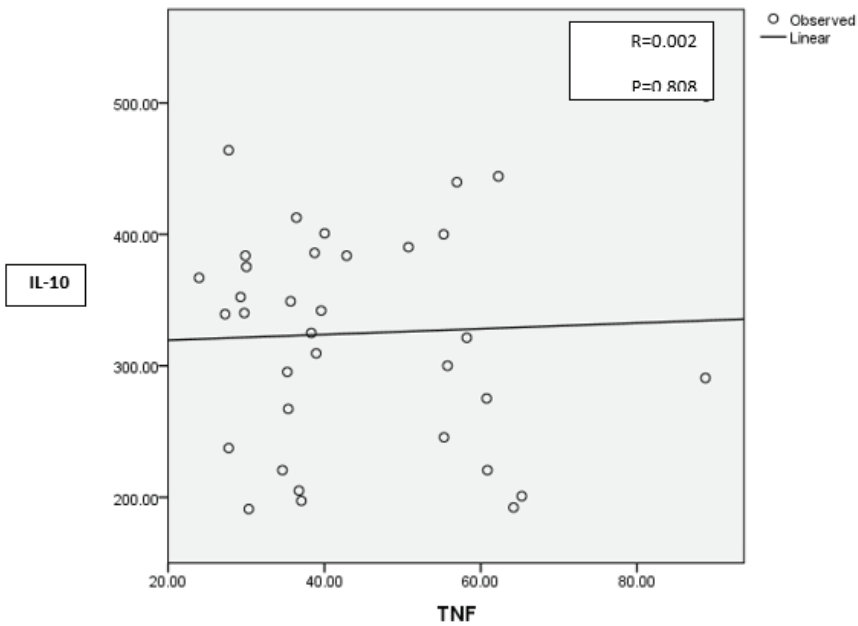



**Figure (2) correlation between IL-10 and TNF-Alpha(Positive)**

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Biotechnology and all experiments were carried out in accordance with approved guidelines.

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# Estimation of Vitamin D Levels in Women with Carpal Tunnel Syndrome (with and without Diabetes)

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## Abstract

**Objective:** Vitamin D is a an important vitamin which is effect on several system of human body, in this study we determination serum levels of vitamin D in women patients with carpal tunnel syndrome (CTS) and investigation the relation between vitamin D and diabetes on CTS patients.

**Materials and Method:** Subjects of this study enrolled 53 women (33 patients and 20 control), their aged range between (30-50) year. The patients were selected from attendee of out- patient Neurology clinic of Al- Imam Sadiq teaching Hospital, Hilla city, Iraq, in the period from December 2018 to April 2019**.** Blood samples were taken from subject to determination vitamin D levels.

**Results:** The present study shows a significant ($p<0.05$) decrease in the mean of vitamin D level in women patients with CTS comparison with control women (15.6±10.2) , (32.7±16.7) respectively. No significant difference was found between vitamin D and diabetes regarding the CTS.

**Conclusion:** The role of vitamin D is the one potential cause of CTS, this study revealed low serum vitamin D level in patient with CTS compared to control .

***Keywords****: vitamin D, carpal tunnel syndrome, diabetes.*

## Introduction

Vitamin D (1,25- dihydroxyvitamin D3) is an extremely important vitamin that has powerful effects on several systems throughout the body[1]. It is a fat soluble vitamin stored in the body tissues and it is the only vitamin that can be synthesized by the human body from the cholecalciferon in the skin from the cholesterol through a chemical reactions when exposed to sunlight, especially the ultraviolet B radiation (UVB) [2], and also its found in certain food such as fatty fish and fortified dairy products, though it's very difficult to get enough from diet alone [3]. Vitamin D should be considered for immune system, cell growth, protein synthesis, muscle function [4,5] and musculoskeletal pains [6]. Receptors of vitamin D is found in bone, kidney, gonads, pancreas, breast, cardiovascular system, brain and immune cells such as macrophages and lymphocytes B and T and monocytes, all these target tissues can convert 25-hydroxy vitamin D to 1,25- dihydroxyvitamin D [7,8]. Vitamin D deficiency in adults is a common problem worldwide(9), low level of this hormone related to neuropathy in patients with diabetes and other neurodegenerative disorders [10]. Also, it has been reported to play a potential role in non-specific persistent painful conditions [11], on the other hand, many researches suggests that vitamin D could play a role in prevention and treatment of many different conditions, including type 1 and type 2 diabetes, hypertension, glucose intolerance, and multiple sclerosis [11]. Carpal tunnel syndrome (CTS) is a medical condition due to compression of the median nerve as it travels through the wrist at the carpal tunnel [12]. It is more common in women and usually begins in adulthood its causes pain, numbness, dysesthesia and loss of strength in hands [13]. The etiological factors of CTS is systemic diseases, such as diabetes mellitus, thyroid function disorders, rheumatoid arthritis, and the most common risk factors for the development of its pregnancy, obesity and recurrent wrist movements [14,15]. The CTS occurs due to increased pressure in the carpal tunnel on the median nerve inducing marked changes in intraneural microcirculation and nerve fiber

structure, impairment of axonal transport, and alterations in vascular permeability, with edema formation and deterioration of nerve function [16]. This study was aimed to investigate the effect of vitamin D on the patients with CTS and comparison with control and examine if a possible association could be found between vitamin D and diabetes in CTS patient.

## Subjects and Method

The current study included 53 subjects (33 patients and 20 control), their aged range between (30-50) year. The patients were selected from attendee of out- patient Neurology clinic of Al- Imam Sadiq teaching Hospital, Hilla city, Iraq, in the period from December 2018 to April 2019. We included patients with diagnosis of CTS based on both clinical symptoms and positive neurophysiology, then taken 5 ml venous blood to determination vitamin D levels. The control group included 20 volunteer with negative neurophysiology and also taken 5 ml venous blood to measuring vitamin D level. Each group of (patients and control) were divided into two groups with and without diabetes. Serum level of vitamin D was determined by Enzyme Linked Fluorescent Assay (ELFA). A questionnaire was designed to collect data including: age, chronic diseases, drug history, smoking, quality of life and type of work. Serum levels less than 20 ng/ml are considered as deficiency, 20 to 30 ng/ml insufficient , and over 30 ng/ml are sufficient amount of vitamin D [17].

## Statistical Analysis

Data were analyzed with SPSS software version 25, Independent T- Test used to calculate mean and SD for vitamin D levels and age between case and control groups and the relation between vitamin D and diabetes were tested by Chi- square test.

## Results

Data of the current study show a low significant differences at ($p>0.05$) of vitamin D levels in patient with CTS comparison with control (15.7± 10.2), (32.7± 16.7) respectively. As well, there was no significant difference in mean age of patients and control women (43.8± 6.7), (41.6± 6.03) respectively as show in table 1.

**Table 1. Average vitamin D levels and age of control and case groups.**

| Parameters | Mean ± SD | Mean ± SD | P- Value |
|---|---|---|---|
| | **Control** | **Case** | |
| | **(n= 20)** | **(n= 33)** | 0.002 |
| Vitamin D | **32.7± 16.7** | **15.7± 10.2** | |
| Age | **41.6± 6.03** | **43.8± 6.7** | |

- Significant at 0.05 level.

On the other hand, there was no significant association in normal and CTS group between vitamin D and diabetes in this study as shown in the figure 1.

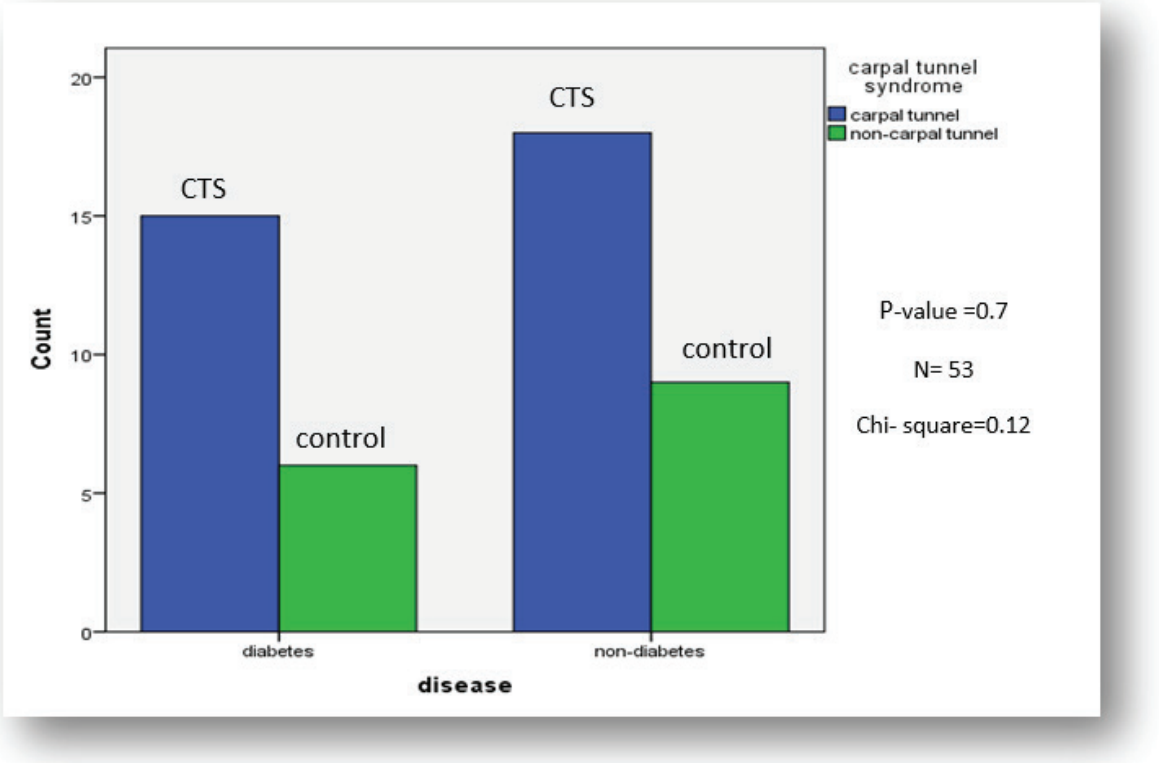


**Figure 1. vitamin D level in control and CTS patients with and without diabetes.**

## Discussions

For decades, the role of vitamin D was recognized as calcium and phosphate homeostasis, the growing evidence suggesting that the role of vitamin D effected on other target organs especially peripheral nervous system(18).

The data of present study showed that CTS patients had a significantly low vitamin D levels than control. This observation was in agreement with recent study that was found the CTS may be triggered by vitamin D deficiency, and that the severity of CTS was correlated with vitamin D levels in the deficiency group (19,20).

Vitamin D is considered as a neuroactive steroid, it was recorded previously that vitamin D induces nerve growth factor and hence could help in the prevention of neurotrophic deficits(21). Furthermore, vitamin D influences the myelination through the activation of several myelin- associated genes as demonstrated by Chabas 2013(22). In addition, data from animal studies showed that vitamin D deficiency was associated with induced nerve condition abnormalities. Acceptable with these results, animal data and basic research studies demonstrated that vitamin D receptors exist on peripheral nerves and Schwann cells, and consequently, vitamin D could promote production of nerve growth factor and axon regeneration in peripheral nerves(23, 24). Notable effect of vitamin D in reducing musculoskeletal pain and numbness, therefore, vitamin D may be used as improvement and treatment of CTS patients(25).

The previous studies which were conducted on a group of patients with diabetic neuropathy showed a relevant association between vitamin D and the development of diabetic neuropathy

Atherton *et al* 2009 found vitamin D levels related to chronic widesgread pain [26]. Similarly, Knutsen*et al* 2010, notice a higher prevalence of hypovitamin D among those with nonspecific musculoskeltal pain, fatigue, or headache [17]. As for, the results of this study refers there is no significant association in normal and CTS group between vitamin D and diabetes and this disagreement with several studies which is suggested there is an association between diabetic neuropathic pain, diabetic neuropathy and vitamin D levels [28,29], the

small samples size did not give a clear indication. also we can explain this case for a low level of vitamin D is tightly related with CTS in both groups (with and without diabetes) as Moon *et al* 2015 explained low vitamin D is related to neuropathy in patients with diabetes and other neurodegenerative disorders(10). On the other hand, we can expect the nature of work and stress may trigger symptoms of CTS by sever and recurrent use of hand , we found most young women without diabetes and suffering from CTS this may be related to the nature of domestic work , especially housewives and this agreement with Swanson *et al* 2013(30), as for women with diabetes and CTS, diabetes may have contributed to the development of CTS and possibly genetics or another factors [31].

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of biology and all experiments were carried out in accordance with approved guidelines.

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# Hematological Study of Spleenctomized Dog in Iraq

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## Abstract

The effect of total and partial splenectomy on hematological value was studied on 12 healthy dogs, divided into two groups (A and B). The total splenectomy (group A) exhibited significant reduction ($P < 0.05$) in Hb, PCV, and total RBC count but increase in ESR values. It also resulted in persistent increase in total leukocyte, neutrophil, and lymphocyte counts. In partial splenectomy produced non-significant effects on hematological parameters. No significant alteration in serum glucose or total protein concentration was observed after total or partial splenectomy.

***Keywords:*** *hematological value, splenectomy, dog, Iraq*

## Introduction

Spleen is a part of hemopotic and immune system, it is play a vital role in the lifespan of erythrocytes, and it is consider a major lymphoid organ and is located in the left cranial abdomen [1]. The function of spleen are storing and element the old red blood cells from blood stream as well as antigen surveillance of the blood and antibody production [2]. The surgical removal of the spleen is called Splenectomy which is performed for animals whose spleen has been affected by trauma or damaged by disease such as cancer, infections or some autoimmune diseases [3]. The most reasons of medical indication for splenectomy is a disease of hemopotic system .Splenectomy is carried out in dog with hemolytic anemia such as hereditary spherocytosis and autoimmune hemolytic anemia [4]. Camacho et al.,(2010) [8] have been mentioned dogs undergo to splenectomy candidate to Babesia canis infection so that must be considered emergency clinical cases and often it was considered fatal in these animals therefor must be given preventive medications. Splenectomy has been identified as a one of important risk factor for the development of serious illness due to natural Babesiaosis in dog [22] Post splenectomy infections and sepsis, due to decrease the level of antibodies and phagocytes activity or thrombosis, due to rises of platelet production in blood have been reported as sides effect of Splenectomy [7,12] [2] The regenerative anemia reveled due to elevate of reticulocyte count and exist of nucleated red blood cells [8]. Marques et al (2003) [12] have been reported autologous spleen transplantation is a batter procedure after complete removed of spleen for maintenance the immune and hematopoietic functions of spleen. Mortimar. (2017) has been showed there was no abnormal postoperative decrease of erythrocyte, hemoglobin or hematocrit values, and regeneration occurred at the same level as in the control dogs. The differences in number of white blood cells with subsequent leukocytosis is showed in dog with splenectomy [7,11] Initially transient neutrophilia is followed by the persistent lymphocytosis and monocytosis. The animals showed highly percentage of leukocytes parallel to the significant left shift, the myelocytes or other cells progenies of granulocytes often exist in blood circulation [14,21,25] . A many researches on laboratory animals mentioned the amounts of spleen tissue aid to increase the ability of recovery function of spleen in auto transplantation of spleen [11,16]

## Material and Method

### A- Animals

Twelve healthy male's dogs aged 8$^{th}$ months included in that study. A physical examination was made in all animals to chick their health status. All dogs were administrated antihelemantics and housed indoors in individual cages and kept under management and nutritional. The animals were randomly divided into two

groups include of six dogs for each group, designated as group A and B.

**Surgical Operations**

Total and partial splenectomy were performed in animals of group 1 and 2, respectively in surgical lab in collage of veterinary medicine\ Kerbala University following the standard anesthesia and surgical procedures [5].

**Hematological Samples**

Blood samples with EDT A for complete blood analysis and without anticoagulant for serum chemistry profile were collected. A one sample was drawn from each animal. The first blood sample was drawn prior to surgical operation to obtain baseline values. The other samples were obtained weekly, starting on week 1st to week 12th post-operative.

## Result and Discussion

**Results of hematological study.**

**Results of erythrocytes**

All dogs in the study remained apparently healthy during the trial period. None of the dogs in both groups suffered any post-surgical complication, such as hemorrhage or peritonitis. Several changes in blood components was identified that persisted for a variable periods following total or partial splenectomy (Table 1). A persistent anemia was observed in animals of group A, as noted by a significant reduction ($P < 0.05$) in RBC count, Hb cone. and PCV values on3 th, 4th ,5th and 6th week post-surgery, as compared to their control values and with group B . The anemia in total splenectomized dogs could be related to loss of the spleen-iron regulatory function as reported in man by earlier workers ,this agree with Sipka et al( 2006) which mentioned the significant decrease of red blood cells values and long postoperative recovery after total splenectomy have been recorded in dog.

A significant ($P < 0.05$) increase in ESR values was observed in animals of both groups, respectively, compared to their control values. However, among groups there was non-significant difference . this higher ESR values might be associated with persistence anemia and has also been explained by Benjamin (2000).

**Table 1. The latter's referred to differences in erythrocytes parameters between group (A) and group (B) at P=≤0.05.**

| **Pre-operative** | | | **Post-operative** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Week | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| A | RBC | 5.98 | 4.1 | 4.08 | 4.02 | 3.98 | 3.86 | 4.08 | 4.28 | 4.06 | 3.97 | 4.13 | 4.23 |
| | | A | A | A | A | A | A | A | A | A | A | A | A |
| | Hb | 14.2 | 11.8 | 11.8 | 12.1 | 10.8 | 9.9 | 11.2 | 11 | 10.7 | 12 | 12.4 | 12 |
| | | A | A | A | A | A | A | A | A | A | A | A | A |
| | PCV | 40 | 39.2 | 28.2 | 28.7 | 27 | 29 | 29.5 | 30.2 | 29.7 | 29.6 | 30.8 | 30.3 |
| | | A | A | A | A | A | A | A | A | A | A | A | A |
| | ESR | 8.2 | 35.2 | 33.3 | 36.5 | 40.5 | 39 | 34.2 | 32.7 | 35.3 | 29.7 | 31.8 | 37.7 |
| | | A | A | A | A | A | A | A | A | A | A | A | A |
| Group | RBC | 6.46 | 5.55 | 5.62 | 5.65 | 5.72 | 5.83 | 5.98 | 6.06 | 6.08 | 6.04 | 5.95 | 6 |
| B | | B | B | B | B | B | A | B | B | B | B | B | B |
| | Hb | 14.5 | 14 | 14.4 | 14.7 | 14.1 | 14.5 | 15.4 | 15.2 | 15.2 | 15 | 14.8 | 15.4 |
| | | B | B | B | B | B | B | B | B | B | B | B | B |

***Cont...*** **Table 1. The latter's referred to differences in erythrocytes parameters between group (A) and group (B) at P=≤0.05.**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PCV | 39 | 38.2 | 38.8 | 44 | 37.2 | 39.2 | 39.6 | 39.8 | 37.7 | 37.5 | 37 | 38.4 |
| | | A | A | B | B | B | B | B | B | B | B | B | B |
| | ESR | 9.5 | 32.5 | 30.5 | 29.6 | 29.2 | 28 | 29.4 | 28.4 | 28.3 | 28.2 | 27.5 | 26.8 |
| | | B | B | B | B | B | B | B | B | B | A | B | B |

**Results of leukocytes**

A significant (P < 0.05) increase in total leukocyte, neutrophil, lymphocyte, and eosinophil counts, a transient increase in monocyte, were observed post-operatively in group A dogs compared to control values and with group B dogs (Figs.3). Modifications in these blood cells could be coupled with total splenectomy and its predisposition for transient and intermittent type of nonspecific bacteremia or septicemia 23.

| **Pre- operative** | | | **Post-operative** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group | Week | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| A | TLC | 8.2 | 14.5 A | 14.4 | 14.6 | 14.6 | 14.4 | 14.6 | 14.4 | 14 | 15 | 14.6 | 14 |
| | | A | | A | A | A | A | A | A | A | A | A | A |
| | N | 4883 | 8465 | 8709 | 7549 | 7578 | 8254 | 8656 | 7645 | 7925 | 8661 | 8574 | 8560 |
| | | A | A | A | A | A | A | A | A | A | A | A | A |
| | L | 2477 | 3863 | 3175 | 3424 | 3664 | 3980 | 3974 | 4332 | 4025 | 4223 | 4034 | 4055 |
| | | A | A | A | A | A | A | A | A | A | A | A | A |
| | M | 365 | 738 | 879 | 629 | 308 | 332 | 448 | 426 | 438 | 665 | 490 | 473 |
| | | | A | A | A | A | A | A | A | A | A | A | A |
| | E | 595 | 138 | 1635 | 2429 | 1669 | 1747 | 1591 | 1747 | 1533 | 1379 | 1350 | 1355 |
| | | A | A | A | A | A | A | A | A | A | A | A | A |
| | B | 68 | 44 | 27 | 20 | 77 | 95 | 30 | 24 | 23 | 61 | 48 | 30 |
| | | A | A | A | A | A | A | A | A | A | A | A | A |
| Group | TLC | 8.7 | 9.8 | 9.4 | 9.4 | 8.9 | 9.2 | 9 | 10.3 | 9.3 | 9.1 | 9.5 | 9.7 |
| B | | A | B | B | B | B | B | B | B | B | B | B | B |
| | N | 5383 | 5893 | 5839 | 5282 | 5498 | 5449 | 5269 | 3951 | 5250 | 5195 | 5415 | 5410 |
| | | B | B | B | B | B | B | B | B | B | B | B | B |
| | L | 2117 | 2471 | 2300 | 2660 | 2328 | 2683 | 2362 | 3143 | 3227 | 2993 | 3144 | 3514 |
| | | B | B | B | B | B | B | B | B | B | B | B | B |
| | M | 419 | 417 | 380 | 395 | 324 | 398 | 360 | 422 | 318 | 382 | 339 | 274 |

***Cont...***

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | B | B | A | A | B | B | B | B | B | B |
| | E | 598 | 935 | 980 | 1230 | 857 | 673 | 682 | 752 | 606 | 478 | 607 | 547 |
| | | A | B | B | B | B | B | B | B | B | B | B | B |
| | B | 90 | 31 | 12 | 10 | 13 | 30 | 0 | 5 | 0 | 0 | 0 | 0 |
| | | B | B | B | B | B | B | A | B | B | B | B | B |

**Table 2. The latter's referred to differences in leukocytes parameters between group (A) and group (B) at P=≤0.05.**

In healthy individual's bacteria are cleared off from circulation rapidly and effectively through phagocytosis by fixed tissues macrophages in the spleen and liver. Persistent bacteremia can occur when bacteria can multiply at a rate that exceeds the ability of the reticuloendothelial system to remove them (Dow and Jones, 2009). In addition, non-infectious factors such as corticosteroid excess caused by fear or other stresses, anesthesia,

laparotomy, or exercise may also be associated with moderate changes in leukogram [17]. In the present study all animals apparently remained clinically healthy throughout the study period and therefore, alteration in leukogram could be a normal body response. This is also supported by earlier reports indicating that a WBC count between 10,000 and 30,000/ µl represents a moderate response to inflammation in dogs [18].

The presence of mild eosinophilia in dogs of group A has been a unique observation in the present study. Eosinophils are known to be an integral component of hypersensitivity and defense against certain parasites. In cat, eosinophilia has been reported to occur along with polycythemia and pernicious anemia after splenectomy [9]. Similarly, leukocytosis has been reported in man and dog as a result of splenectomy and were attributed to an increase in neutrophils, lymphocytes, and eosinophils [24]

Therefore, it seems as the eosinophilia in the present study was either due to splenectomy or might have occurred as an influx of bone marrow reserve as seen in man. [19]

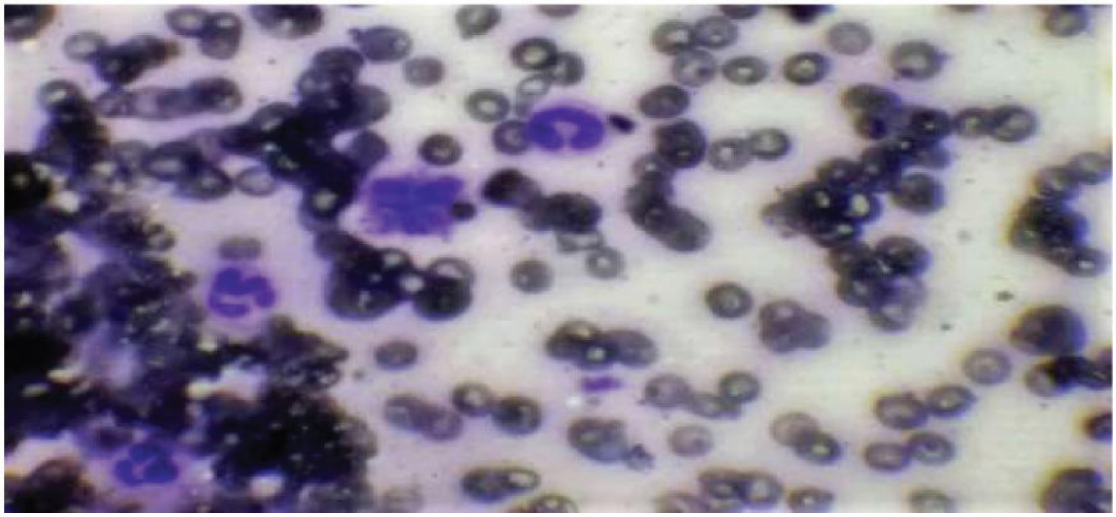

**Fig (1) Band neutrophil in blood film of total spleenactomized dog**

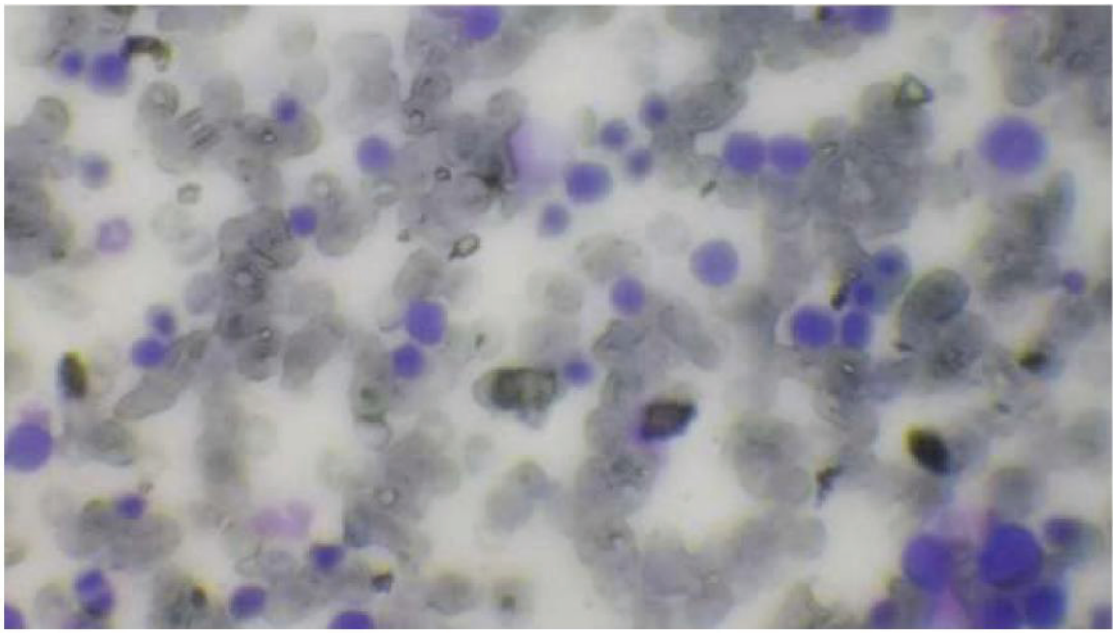

**Fig (2) Lymphocytosis in blood film of total spleenactomized dog**

From these results were concluded there was many significant differences in hematological parameters in erythrocytes and leukocytes in spleenactomized dog.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Veterinary Medicine and all experiments were carried out in accordance with approved guidelines.

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# The Effect of Using the Cognitive Strategies on the Achievement and Practical Performance of Physiology (Modeling / Reciprocal teaching)

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**Abstract**

The research aims to know the impact of using the strategies of cognitive perception on the achievement and practical performance of physiology, and to achieve the goal of the research under the formulation of zero hypotheses: There is no statistically significant difference at the level of (05.0) between the average grades of students in the achievement of students of the three groups of physiology. There is no statistically significant difference at the level of (05.0) between the average grades of students in the practical performance of the students of the three groups of physiology. The research community consisted of the students of the first stage in the Technical Institute. The sample was randomly tested as it reached 45 students. The equivalence between the research groups was confirmed through the following variables: (Age, Intelligence). As for practical achievement, (15) objective test items were drafted covering the subject, and to ensure the validity of the test was presented to a number of experts specialized in education and teaching methods, and the validity and consistency of the discrimination factor and the difficulty factor and the effectiveness of alternatives to the test were calculated.

***Keywords:*** *Cognitive strategies***,** *Modeling, Reciprocal teaching*

## Introduction

Recent studies emphasize that the student is the focus of the educational process and the adoption of work and experience a cornerstone of education [1], and the Institute as one of the educational institutions provide a service to the community and seeks to develop and keep [2] pace with technological development to educate the student to sound thinking and equipped with basic knowledge and skills. Physiology is one of the important subjects of life sciences, and despite its importance, this article is still taught by dumping and recipients by the teacher, and this is consistent with a lot of research and studies, but the use of regular methods in the field of education leads to poor understanding and correct perception, and weak Students have different thinking skills to solve the daily problems they face in the study [4]. Therefore, the development of mental abilities has become the main objective of the educational process in all countries of the world, as the progress of countries is measured by their ability to develop the minds of their children. To achieve this, many countries have made strenuous efforts and conducted many practical research aimed at regulating student thinking. [25]

Teaching methods are not the same but are the result of social needs and circumstances and demands are changing educational goals and concerns to meet the requirements of society [7]. And the importance of teaching methods and to achieve educational goals and the adoption of modern methods of teaching, including a symposium held at the University of Baghdad (1993), where recommended to contribute to the development of the educational process.

Therefore, studies and researches turned to metacognition theory, which cares for the student to monitor, control and learn. This helps to acquire different learning processes that encourage students to think and be able to solve their scientific problems [7]. This supra-cognitive strategy means thinking and helping the student positively in gathering, organizing, following up and evaluating information during the learning process. This supra-cognitive strategy contributes effectively to

the learning and problem-solving process as it helps to achieve learning objectives and helps students to access cognitive processes.

**Laboratory and practical performance:**

**Genesis of laboratory work:**

Scientists in the field of laboratory work, such as Avicenna in medicine and optics, and Ibn Hayyan in chemistry, became famous in the field of chemistry. The idea of experiments began in Britain and Germany, and the teaching of science in the United States in 1874 was questioned.

Laboratories were set up in high schools and colleges in the late 18th century, believing that students would learn better by repeating the original experiences of Newton, Priestley and others.

**The performance:**

Performance is the unit of measurement of knowledge that the student shows in the situation and is the product of interaction, understanding and thinking that the student employs in the situation. What the student shows is the product of a comprehensive mental work that includes a response to the world and the knowledge system in an integrated environment.

**Performance includes:**

1. Performance Tasks: They are direct and realistic and require:

Performing a series of activities or performing a particular work.

Compound products (products) that achieve certain quality levels or present these products as an integrated unit separate from performance.

Performance Requirements:

The skill has three components and can even achieve practical performance: -

1. Information, knowledge and concepts.

2. Movements and coordination between movements.

3. Values and trends adopted by the student who is trained to perform the skill.

**Laboratory performance evaluation:**

The laboratory work falls under four aspects or aspects of laboratory activity:

1. Planning and design: involves students doing laboratory activities - forming questions - predicting results.

2. Performance: It includes students' laboratory achievements on experiments - observation, recording of data and drawings.

3. Analysis and interpretation: Data processing, interpretation of relationships, ask new questions.

4. Application: The student to make scientific predictions in new situations. (Zeitoun, 2007, 668)

**Research Procedures**

**Determine the research community:**

Determining the study population is one of the important methodological steps in educational research.

The research community was identified by the Technical Medical Institute / Baghdad for the academic year (2018-2019).

**The research sample:**

Research sample testing is one of the most important factors that influence experimental research. The research sample was selected from the students of the first stage of the Technical Medical Institute/ Baghdad. The sample was divided into (a) taught by supra-cognitive strategies (modeling), (b) taught by (reciprocal teaching), and (c) taught routinely.

**Table 1. Distribution of research sample among groups and number of students**

| Groups | Group Name | Number Of Students Before Exclusion | Number of Students After Exclusion | Final Number |
|---|---|---|---|---|
| First Experimental Group | A | 19 | 5 | 14 |
| Second Experimental Group | B | 18 | 2 | 16 |
| Control Group | C | 17 | 2 | 15 |

**Experimental design test:**

Experimental design is of great importance, as it ensures scientific accuracy

This study had two factors: the cognitive strategy (cognitive) (modeling) and (interactive teaching), so the experimental design was adopted three groups of two experimental groups and a control group.

**Table 2. Experimental design was adopted three groups of two experimental groups and a control group.**

| Groups | Equivalence | Independent Variable | The Dependent Variable |
|---|---|---|---|
| First Experimental Group | Age | Strategy Of Cognitive Supra-Cognitive Modeling | Collection |
| Second Experimental Group | Intelligence | Interactive Teaching | Practical Performance |
| Control Group | | Normal Way | |

## Equal groups:

(A) Chronological Age in Months:

The mean age of the students was calculated in months, and extracted the mean of

**B- Intelligence:**

To find out the intelligence of the research sample. The Raven test is applied because it is characterized by honesty, consistency, usability and age group. After finding IQ scores (60), the mean was calculated for all the research groups, where the ratio was (73.44, 00.46, 00.45).

**External safety of experimental design:**

Although groups were randomly tested, non-experimental variables that affect the safety of the experiment were attempted.

1. Adjust the contrast tools: Achievement test was used for the three research groups.

2. Duration: The duration of the research was determined (the first course).

3. Quotas: Quotations were distributed two hours each week to ensure equal time allocated to the laboratory.

Search Requirements:

1. Determination of scientific material: The scientific material of physiology (course I) was determined.

2. Preparing the teaching plan.

3. Study Plan: It is a framework or set of procedures or are the steps organized to make the teaching process a success. (Abdulsalam, 2001, 72)

4. Preparation of experimental work guide: Then prepare experiments for conducting in the laboratory.

**Test stability:**

The stability of the test was calculated by Alfa Kronbach, where the stability was (83.0).

**Statistical means:**

1. Analysis of monotonous variance:

Variance analysis was used for the equivalence of the three research groups.

**2. Difficulty Coefficient:**

The difficulty factor for the objective paragraph was used for achievement test.

$$P = \frac{n_u + n_L}{2n} \frac{n_u + n_L}{2n}$$

3. The power of discrimination:

$$D = \frac{P_u + P_L}{\frac{1}{2}(n)} \frac{P_u + P_L}{\frac{1}{2}(n)}$$

4. Alpha-Cronbach equation: Achievement test coefficient.

5. Tukey Method: Indicates the difficulty of the differences between the results.

$$Q = \frac{X_1 - X_2}{\sqrt{MSW}} \frac{X_1 - X_2}{\sqrt{MSW}}$$

## Results

**1. The first hypothesis:**

To achieve the first zero hypothesis (there are no statistically significant differences at the level of 0.00 between the average scores of students of the three groups studied by modeling and the second group by interactive teaching and the control group by the normal method) and the arithmetic mean of the three groups was calculated in the achievement test as shown In the table.

**Table 3. Results of mono-variance analysis to show significant differences in achievement**

| Contrast Source | Total Squares | Degree of Freedom | Average Squares | Calculated Value | Tabular Value | Statistical Significance |
|---|---|---|---|---|---|---|
| Between Groups | 43,513 | 2 | 22,256 | | | |
| Within Groups | 13,366 | 42 | 77,7 | 35,28 | 1503,3 | 0.05 |
| Total | 58,880 | 2 | | | | |

The above table shows that the calculated Y-value was (35.28) and the tabular Y-value (1503.3), that is, the calculated Y-value is greater than the tabular Y-value, which affects the existence of statistically significant differences in the achievement of the three research groups. There was a statistically significant difference, so the T method was used to compare two equal media to identify the differences. (Al-Bayati, 2008, 264). Therefore, the tabular value (Q) (38.0) was calculated, as well as the calculated (Q) value (43.3) between the two media. This indicates that there is no statistically significant difference between the first and second experimental groups in the collection.

**Table 4. The results of the analysis of comparison between the differences of the average of the three groups**

| the group | Averages | The difference between averages | The calculated Q value | The Q value is | tabular Significance at 0.05 |
|---|---|---|---|---|---|
| Total Experimental 1 | 3,20 | 3,0 | 38,0 | 43,3 | NonFunction |
| Total Experimental 2 | 6,20 | | | | |
| Total Experimental 1 | 6,20 | 0,7 | 2,9 | 43,3 | Function |
| Total Controls | 3,13 | | | | |
| Total Experimental 2 | 6,20 | 2,7 | 6,9 | 43,3 | Function |
| Total Controls | 3,13 | | | | |

The table shows that the value of (Q) calculated between the first and control groups (2.9) is greater than the table value (Q) of (43.3), and this shows a statistically significant difference between the first experimental and control groups in favor of the experimental group. First.

In addition, the value of (Q) calculated between the first and control groups of (6.9) was greater than the tabular value of (Q) of (43.3). This indicates that there is a statistically significant difference in the achievement between the second and control experimental group. In favor of the second experimental group.

2- The second zero hypothesis: which provides (the absence of statistically significant differences at the level of 0.0.0 between the average degrees of practical performance of students of the three groups).

**Table 5. The results of the analysis of unilateral variation to show individual differences in practical performance among students of the three groups**

| Contrast Source | Total Squares | Degree of Freedom | Average Squares | Calculated Value | Tabular Value | Statistical Significance |
|---|---|---|---|---|---|---|
| Between Groups | 40,371 | 2 | 20,185 | | | 0.05 |
| Within Groups | 60,204 | 42 | 89,4 | 04,37 | 1503,3 | |
| Total | 00,576 | 2 | | | | |

The table shows that the calculated Y-value was (04.37) and the tabular Y-value (1503.3), that is, the calculated Y-value is greater than the tabular Y-value. This indicates that there are statistically significant differences at the level of (05.0). In the practical performance of the three research groups. Using T method to identify differences between groups. Table (8) illustrates this.

**Table 6. The results of the comparison analysis between the mean differences for the three groups in the practical performance**

| The Group | Averages | The Difference between averages | The Calculated Q value | The Q value is | Tabular Significance at 0.05 |
|---|---|---|---|---|---|
| Total Experimental 1 | 6,16 | 2,3 | 6,5 | 43,3 | Function |
| Total Experimental 2 | 8,13 | | | | |
| Total Experimental 1 | 6,16 | 0,7 | 2,12 | 43,3 | Function |
| Total Controls | 6,10 | | | | |
| Total Experimental 2 | 8,13 | 2,4 | 3,7 | 43,3 | Function |
| Total Controls | 6,10 | | | | |

The table shows that the calculated value of Q (6.5) is greater than the tabular value (Q) of (43.3). This indicates that there is a statistically significant difference between the first and second groups in practical performance and for the benefit of the first experimental group.

The table also shows that the value of (Q) calculated between the first experimental group and the control group of (2.12) is greater than the value of the (Q) tabular value of (43.3). First experimental group.

## Conclusions

The researcher reached the following conclusions:

1. Teaching according to the strategy of cognitive supra-cognitive has had an impact in increasing students of the Technical Technical Institute

2. Teaching according to supra-cognitive strategies of practical performance has had an effective effect in raising the level of students.

3. Teaching according to this strategy requires more time and effort for the teacher and student than is required when using other teaching methods.

4. Teaching according to supra-cognitive strategies has affected students who have awareness of their knowledge and are more organized in their performance of experience than students who do not.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Technical medical Institute –Baghdad and all experiments were carried out in accordance with approved guidelines.

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# Effectiveness of Instructional Program for Nurses' Knowledge regarding Oxygen Administration Methods at Pediatric Teaching Hospitals in Mosul City

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## Abstract

**The Objective:** To evaluate the effectiveness of instructional program for nurses' knowledge regarding oxygen administration methods at pediatric teaching hospitals in Mosul City.

**The Methodology:** A quasi-experimental study was applied at pediatric teaching hospitals in Mosul City from 21 of October/ 2018 till 17 of July / 2019. The selection of the sample was using the non- probability (Purposive) sample that chosen for the current study. The total study sample consisted of (52) nurses, (26) nurses working in the Al-Kansaa Teaching Hospital and (26) nurses working Ibn Al-Atheer Teaching Hospital from Mosul City. The program lectures and questionnaire were constructed and provided for nurses to evaluate the effect of the instructional program on nurse's knowledge. The Pearson's coefficient of correlation result are ($r= 0.756$) and are significant at $p \leq 0.05$ level was used to estimate the scale (test – retest) by using SPSS version 25.

**Results** shows that statistical differences (paired samples t-test) of the knowledge for the study and control group concerning the oxygen administration methods for pediatric. There are high significant relationships between pre-test and post-test result for study group. But are not significant relationships between pre-test and post-test result for control group at P.value $\leq 0.05$ levels.

***Keywords:*** *Instructional Program, Nurses' knowledge, Oxygen Administration Methods.*

## Introduction

The oxygen is fundamental for living. Barely any organs like heart, mind, and kidney need high measures of oxygen for their survival dependent on their cell necessity, the condition of oxygen may be deferent in many cases such as infection, exercises, increase metabolism and injury; the body well not has a store of oxygen[1]**.** Undoubtedly, O2 treatment could be a very important tool and has saved many lives and improved others, however, number eight treatment risk, cost, and edges have to be compelled to be thought-about inside an equivalent suggests that as medicine and titrated to a measured end purpose to avoid excessive or inadequate dosing, withholding number eight can have a damaging effect; nevertheless continuing to produce O2 treatment once it's not indicated will prolong hospitalization and increase the value of care, this comprehensive review begins with complete assessment and evaluation the effects of physiological, toxicities potential, and customary delivery procedures[2]. Also that represents as a routine treatment procedure in pediatric hospitals, has principal objectives such as reducing the child patient's respiratory and cardiac workload, also increasing heart rate, alveolar pressure and hemodynamic competence, preventing hypoxia or hypoxemia and mortality[3].

**Material and Methods:**

**Design of the study:** An experimental study design for two groups, study and control group (pretest-posttest) carried out at medical ward of pediatric teaching hospitals in Mosul city to evaluate the effect of the instructional program on nurse's knowledge regarding oxygen administration methods at pediatric teaching hospitals from 21 of October/ 2018 till 17 of July / 2019

**Sample of the study:** the selection of the sample was using the non- probability (Purposive) sample that chosen for the current study. The total study sample consisted of (52) nurses, (26) nurses working in the Al-Kansaa Teaching Hospital and (26) nurses working Ibn Al-Atheer Teaching Hospital from Mosul City.

Study tool: The program lectures and questionnaire were constructed and provided for nurses to evaluate the effect of the instructional program on nurse's knowledge regarding oxygen administration methods. The program lectures was contain five lecture, two lecture each week, and The questionnaire was contain two parts, first part concerns the demographic information, while another part was contained the nurses' knowledge regarding oxygen administration methods and contains five sections. The estimate evaluation of the nurses' knowledge are failure = (0-1) answer knowledge score, not acceptable = (2) answer knowledge score, acceptable = (3) answer knowledge score, good = (4) answer knowledge score, Excellent = (5) answer knowledge score. But the estimate for total knowledge are failure = (0-5) answer knowledge score, not acceptable = (6-10) answer knowledge score, acceptable = (11-15) answer knowledge score, good = (16-20) answer knowledge score, excellent = (21-25) answer knowledge score.

**Validity of the study:** The validity of the program lectures and questionnaire tool was established through a panel of experts whom specified the content clarity, relevancy, and adequacy.

**Data collection:** The data were collected from pediatric teaching hospitals in Mosul City. The study sample consisted of (52) nurses, (26) nurses working in the Al-Kansaa teaching hospital and (26) nurses working Ibn Al-Atheer teaching hospital, the period from 13 of January till 26 of February / 2019.

## Result

**Table (1): Statistical Knowledge Results for Study and Control Group Nurse's in Concerning the Oxygen Administration Methods for Pediatric**

| Knowledge | Estimate | Study Group | | | | Control Group | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Pre-test | | Post-test | | Pre-test | | Post-test | |
| | | F. | % | F. | % | F. | % | F. | % |
| General knowledge and purpose or aim of use | Fail | 0 | 0.0 | 0 | 0.0 | 1 | 3.8 | 7 | 26.9 |
| | Not Acceptable | 15 | 57.7 | 0 | 0.0 | 15 | 57.7 | 11 | 42.3 |
| | Acceptable | 8 | 30.8 | 3 | 11.5 | 10 | 38.5 | 7 | 26.9 |
| | Good | 3 | 11.5 | 8 | 30.8 | 0 | 0.0 | 1 | 3.8 |
| | Excellent | 0 | 0.0 | 15 | 57.7 | 0 | 0.0 | 0 | 0.0 |
| The normal values and nursing consideration | Fail | 18 | 69.2 | 0 | 0.0 | 19 | 73.1 | 19 | 73.1 |
| | Not Acceptable | 7 | 26.9 | 0 | 0.0 | 7 | 26.9 | 5 | 19.2 |
| | Acceptable | 1 | 3.8 | 5 | 19.2 | 0 | 0.0 | 2 | 7.7 |
| | Good | 0 | 0.0 | 17 | 65.4 | 0 | 0.0 | 0 | 0.0 |
| | Excellent | 0 | 0.0 | 4 | 15.4 | 0 | 0.0 | 0 | 0.0 |
| The clinical manifestation of the children during oxygen administration | Fail | 9 | 34.6 | 0 | 0.0 | 10 | 38.5 | 11 | 42.3 |
| | Not Acceptable | 12 | 46.2 | 0 | 0.0 | 15 | 57.7 | 13 | 50.0 |
| | Acceptable | 5 | 19.2 | 9 | 34.6 | 1 | 3.8 | 2 | 7.7 |
| | Good | 0 | 0.0 | 14 | 53.8 | 0 | 0.0 | 0 | 0.0 |
| | Excellent | 0 | 0.0 | 3 | 11.5 | 0 | 0.0 | 0 | 0.0 |

***Cont...*** **Table (1): Statistical Knowledge Results for Study and Control Group Nurse's in Concerning the Oxygen Administration Methods for Pediatric**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Influencing factors and methodology for selecting the appropriate method | Fail | 18 | 69.2 | 0 | 0.0 | 20 | 76.9 | 17 | 65.4 |
| | Not Acceptable | 6 | 23.1 | 0 | 0.0 | 6 | 23.1 | 6 | 23.1 |
| | Acceptable | 2 | 7.7 | 6 | 23.1 | 0 | 0.0 | 3 | 11.5 |
| | Good | 0 | 0.0 | 16 | 61.5 | 0 | 0.0 | 0 | 0.0 |
| | Excellent | 0 | 0.0 | 4 | 15.4 | 0 | 0.0 | 0 | 0.0 |
| The oxygen humidification and complications of oxygen using | Fail | 8 | 30.8 | 0 | 0.0 | 11 | 42.3 | 9 | 34.6 |
| | Not Acceptable | 15 | 57.7 | 0 | 0.0 | 15 | 57.7 | 16 | 61.5 |
| | Acceptable | 3 | 11.5 | 8 | 30.8 | 0 | 0.0 | 1 | 3.8 |
| | Good | 0 | 0.0 | 11 | 42.3 | 0 | 0.0 | 0 | 0.0 |
| | Excellent | 0 | 0.0 | 7 | 26.9 | 0 | 0.0 | 0 | 0.0 |
| The Total | | 26 | 100.0 | 26 | 100.0 | 26 | 100.0 | 26 | 100.0 |

**Failure** = (0-1) answer knowledge score, **Not acceptable** = (2) answer knowledge score, **Acceptable** = (3) answer knowledge score, **Good** = (4) answer knowledge score, **Excellent** = (5) answer knowledge score. **F**=Frequency, **%**= percentage

The table (1) shows the statistical knowledge results for study group nurse's in concerning the oxygen administration methods for pediatric, that general knowledge and purpose or aim of use in pre-test are 57.7% (15) of them at not acceptable level, Post-test are 57.7 % (15) of the at excellent level. The normal values and nursing consideration in pre-test are 69.2% (18) of them at fail level, post-test are 65.4% (17) of them at good level. The clinical manifestation of the children during oxygen administration in pre-test are 46.2% (12) of them at not acceptable level, post-test are 53.8% (14) of them at good level.

**Table (2): Statistical Total Knowledge Results for Study and Control groups in Concerning the Oxygen Administration Methods for Pediatric**

| | **Knowledge** | **Estimate** | **Pre-test** | | **Post-test** | |
|---|---|---|---|---|---|---|
| | | | **F.** | **%** | **F.** | **%** |
| 1. | Study group | Fail | 2 | 7.7 | 0 | 0.0 |
| | | Not Acceptable | 21 | 80.8 | 0 | 0.0 |
| | | Acceptable | 3 | 11.5 | 0 | 0.0 |
| | | Good | 0 | 0.0 | 13 | 50.0 |
| | | Excellent | 0 | 0.0 | 13 | 50.0 |
| 2. | Control group | Fail | 3 | 11.5 | 7 | 26.9 |
| | | Not Acceptable | 23 | 88.5 | 18 | 69.2 |
| | | Acceptable | 0 | 0.0 | 1 | 3.8 |
| | | Good | 0 | 0.0 | 0 | 0.0 |
| | | Excellent | 0 | 0.0 | 0 | 0.0 |
| | The Total | | 26 | 100.0 | 26 | 100.0 |

**Failure** = (0-5) answer knowledge score, **Not acceptable** = (6-10) answer knowledge score, **Acceptable** = (11-15) answer knowledge score, **Good** = (16-20) answer knowledge score, **Excellent** = (21-25) answer knowledge

score. **F**=Frequency, **%**= percentage

The table (4) shows the statistical total knowledge results for study and control groups in concerning the oxygen administration methods for pediatric. That the study group at pre-test are 80.0% (21) of them at not acceptable level, post-test are 50.0% (13) of them at excellent and good level. But the control group in pre-test is 88.5 % (23) of them at not acceptable level, post-test are 69.2% (18) of them at not acceptable level.

**Table (3): Statistical Differences (Paired Samples t-test) of the Knowledge for the Study and Control group Concerning the Oxygen Administration Methods for pediatric**

| Groups | The Test | **Mean** | **Std. D.** | **t** | **P.value** | **Sig** |
|---|---|---|---|---|---|---|
| Study Group | Pre - Post | -2.462 | 0.706 | -17.778 | **0.000** | **S** |
| Control Group | Pre - Post | 0.115 | 0.588 | 1.000 | 0.327 | NS |

Std. D. = Standard Deviation, t=t-test, Sig=Significant at P.value ≤ 0.05 level

The table (3) presents the statistical differences (paired samples t-test) of the knowledge for the study and control group concerning the oxygen administration methods for pediatric. There are high significant relationships between pre-test and post-test result for study group. But are not significant relationships between pre-test and post-test result for control group at P.value ≤ 0.05 levels.

**Table (4): Statistical Differences (ANOVA - Pairwise Comparison) for constructional program (Pre-test, Post-test) between the Study and Control Groups Concerning the Oxygen Administration Methods for Pediatric**

| **Dependent Variable** | **Groups** | **Mean** | **P.value** | **Sig** |
|---|---|---|---|---|
| Pre-test | Study Group | 2.038 | 0.161 | NS |
| | Control Group | 1.885 | | |
| Post -test | Study Group | 4.500 | 0.000 | S |
| | Control Group | 1.769 | | |

Multiple comparisons: Bonferroni ANOVA is significant at P.value ≤ 0.05 level

The table (4) shows the statistical differences (ANOVA - pairwise comparison) for constructional program (pre-test, post-test) between the study and control groups concerning the oxygen administration methods for pediatric. There are not significant relationships between study group and control group result for pre-test. But there are high significant relationships between study group and control group result for post-test at P.value ≤ 0.05 levels

**Table (5): Statistical Relationships of the Study between the Demographic Variables of Nurses and Results of the Constructional Program**

| | **The Demographic Variables** | **Study Group** | | | |
|---|---|---|---|---|---|
| | | **Pre** | | **Post** | |
| | | **P.value** | **Sig.** | **P.value** | **Sig.** |
| 1. | Age | 0.69 | NS | 0.51 | NS |
| 2. | Gender | 0.64 | NS | 1.00 | NS |
| 3. | Level of education | 0.72 | NS | 0.10 | NS |
| 4. | General employments period | 0.36 | NS | 0.82 | NS |
| 5. | The period of working in the current hospital | 0.05 | NS | 0.72 | NS |
| 6. | Training courses | 0.74 | NS | 0.44 | NS |
| 7. | Reading Source | 0.64 | NS | 0.13 | NS |
| | **The Demographic Variables** | **Control Group** | | | |
| | | **Pre** | | **Post** | |
| | | **P.value** | **Sig.** | **P.value** | **Sig.** |
| 1. | Age | 0.03 | S | 0.19 | NS |
| 2. | Gender | 0.07 | NS | 0.46 | NS |
| 3. | Level of education | 0.22 | NS | 0.70 | NS |
| 4. | general employments period | 0.03 | S | 0.04 | S |
| 5. | the period of working in the current hospital | 0.20 | NS | 0.26 | NS |
| 6. | training courses | 0.80 | NS | 0.61 | NS |
| 7. | Reading Source | 0.33 | NS | 0.74 | NS |

Relationship is significant at P.value ≤ 0.05 level

The table (5) presents statistical relationships of the study between the demographic variables of nurses and results of the constructional program. There are not significant relationships between study group result (pre-test and post-test) with all demographic variables except the pre-test with the period of working in the current hospital and not significant relationships with other demographic variables. The control groups in pre-test are significant relationships with age and general employments period only, but the post-test are significant relationships with general employments period only and not significant relationships with other demographic variables.

## Discussion

The table (1) shows the statistical knowledge results for study group nurse's in concerning the oxygen administration methods for pediatric, that general knowledge and purpose or aim of use in pre-test are 57.7% (15) of them at not acceptable level, Post-test are 57.7 % (15) of the at excellent level. The normal values and nursing consideration in pre-test are 69.2% (18) of them at fail level, post-test are 65.4% (17) of them at good level. The clinical manifestation of the children

during oxygen administration in pre-test are 46.2% (12) of them at not acceptable level, post-test are 53.8% (14) of them at good level. The Influencing factors and methodology for selecting the appropriate method in pre-test are 69.2% (18) of them at fail level, post-test are 61.5% (16) of them at good level. The oxygen humidification and complications of oxygen using in pre-test are 57.7 % (15) of them at not acceptable level, post-test are 42.3% (11) of them at good level. This result disagree with Kanaka R and Padma K (2016) that shows among 30 sample of nursing students 5 (16.7%) have inadequate knowledge, 15 (50%) have moderately adequate knowledge regarding and, 10 (33.3%) have adequate knowledge regarding pediatric oxygenation[11]. The table (2) shows the statistical total knowledge results for study and control groups in concerning the oxygen administration methods for pediatric. That the study group at pre-test are 80.0% (21) of them at not acceptable level, post-test are 50.0% (13) of them at excellent and good level. But the control group in pre-test is 88.5 % (23) of them at not acceptable level, post-test are 69.2% (18) of them at not acceptable level.

The table (3) presents the statistical differences (paired samples t-test) of the knowledge for the study and control group concerning the oxygen administration methods for pediatric. There are high significant relationships between pre-test and post-test result for study group. But are not significant relationships between pre-test and post-test result for control group at P.value $\leq$ 0.05 levels. The table (4) shows the statistical differences (ANOVA - pairwise comparison) for constructional program (pre-test, post-test) between the study and control groups concerning the oxygen administration methods for pediatric. There are not significant relationships between study group and control group result for pre-test. But there are high significant relationships between study group and control group result for post-test at P.value $\leq$ 0.05 levels. The table (5) presents statistical relationships of the study between the demographic variables of nurses and results of the constructional program.

## Conclusion

1. The nurses of the pediatric teaching hospital in Mosul city do not have appropriate and adequate knowledge regarding the oxygen administration methods.

2. There is a significant relationship between the pre-test and post-test results of the study group regarding the oxygen administration methods knowledge.

3. Effectiveness of the Instructional program is proved through the high significant relationship of the nurse's knowledge between the study and control groups regarding the oxygen administration methods knowledge.

4. There is no significance correlation between the nurses' knowledge and all demographic characteristics except the general employments period and age of the study group nurses

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

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# Nurses Knowledge Assessment Concerning Prevention of Ventilator-Associated Pneumonia

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## Abstract

(VAP) is defined as pneumonia that develops in mechanically ventilated patients after 48 hours or more of mechanical ventilator support, VAP increases the mortality and morbidity rates of patients and healthcare costs, This study was a descriptive cross-sectional survey. Sample a total sample of 126 nurses was collected for the current study,setting and Participants a convenience sample of graduate nurses was obtained from eight hospitals throughout Babylon. The study was approved by the ethics committees of the Babylon health department and the participating, Researcher used standard a questionnaire that integrated the assessment of nurse's knowledge for prevention of VAP from the Center of Disease Control and Prevention questionnaire was validated by a panel of four specialists in the disciplines of nursing, The questionnaire was administered to the participants in their hospitals by the principle investigator. Nurses were informed that their completion of the questionnaire would be considered as consent to participate.SPSS version 22 was used for data analysis, The study conclude that the mean age of participants in the study was young and female, the majority of the nurses didn't know that the mechanical ventilator humidifier must be changed weekly to prevent VAP. Researcher encourage all Iraqihospitals ICUs nurses to involve inclinical training to improve nurses acquisition and to evaluate the content of the nursing curricula to identify shortcomings in content. It is imperative that VAP-prevention guidelines be integrated in training and teaching within the nursing schools, and that the content and teaching strategies of infection control courses are updated.

***Key words: Nurses knowledge, Ventilator-Associated Pneumonia.***

## Introduction

The Institute for Healthcare Improvement and the American Thoracic Society have developed evidence-based guidelines to prevent Ventilator Associated Pneumonia (VAP) which is a common nosocomial infection that is associated with increased length of hospitalization, VAP affects 10%-25% of patients who are treated in intensive care units for more than two days, Therate of VAP varies between countries, with higher prevalence and mortality rate reported in developing countries [1] (VAP) is defined as pneumonia that develops in mechanically ventilated patients after 48 hours or more of mechanical ventilator support, VAP increases the mortality and morbidity ratesof patients and healthcare costs Mechanically ventilated patients are at high risk for developing VAP owing to diverse reasons such as the presence of an endotracheal tube, altered sensorium oral inflammation, impaired mucociliary clearance, inhibition of cough response and micro aspiration of secretions [2]. In 2007, the Institute for Healthcare Improvement (IHI) created the Triple Aim, Which focused on "improving the experience of care providers, improving the health of populations and reducing per capita cost of healthcare." Since that time, healthcare systems across the country have ramped up efforts to reduce the incidence of hospital-acquired conditions (HAC), which account for some readmissions, declining health, and rising costs. To some degree, those efforts are paying off. The Department of Health and Human Services (HHS) reported approximately 87,000 fewer inpatient deaths and a 17% decline in hospital-acquired

conditions from 2010 to 2014, resulting in a reduction of almost $40 billion in healthcare costs [3]

VAP is account for the highest burden of nosocomial infection as well of health care which is of a serious concern today. It has been reported that the incidence of a nosocomial infections in intensive care unit is about 2 to 5 times higher than in the general in-– patient hospital[4]. A systematic literature review and meta-analysis undertaken the use of antiseptics lowers the risk of VAP, though it does not contribute to the reduction in mortality and duration of ICU stay. [2] The positive effect of preventive measures may decrease with length of time at risk. Moreover, continuous aspiration of subglottic secretions has a favorable effect on the incidence of early onset VAP, but the effects on late-onset VAP are less definite. [5] . Tracheal suctioning is one of the most common invasive procedures performed by nurses on ICU patients and is crucial to reducing the risk of VAP; Tracheal suctioning is traditionally performed using the open suction system which involves disconnecting the patient from the ventilator and introducing a single-use suction catheterconsists of a multi-use suction catheter included within the ventilation circuit, preventing the need for disconnection and the resultant loss of airway pressure. [6]

Knowledge about VAP prevention varied widely among physicians and nurses. Knowledge gaps affect the implementation and monitoring of VAP prevention practices. Continuing education remains imperative, Knowledge of guidelines for prevention of VAP among healthcare workers (HCWs) has been infrequently assessed and mainly in staff nurses only. The gaps between individual knowledge of VAP prevention and actual daily clinical practice have not been compared. [7]

Prevention of VAP is much more cost-effective than treatment which is an essential objective of health care delivery within ICUs. Care bundle protocols are different and controversial in different hospitals, Preventing infections is the daily work of nurses in every hospital. This applies to the critical unit as well where nurses are the forefront of infection prevention either VAP or other. They create and provide the safe environment, take responsibility for nursing care and play a pivotal role in preventing nosocomial infections. American Organization of Nurse Executives (2015) clinical operations, care management, quality and safety, the patient experience, performance improvement and workforce planning. In addition this role has business and financial expertise. The role of the system chief nurse executive (CNE

**Expected Nursing Practice**

Collaborate to identify patients where implementation of noninvasive positive pressure ventilation (NIPPV) may be appropriate to prevent the need for intubation

Assess readiness to extubate daily through combined spontaneous awakening trials (SATs: sedation interruption/minimization) and spontaneous breathing trials (SBTs), unless clinically contraindicated

Maintain and improve physical conditioning through early exercise and mobility

Elevate the head of bed (HOB) to 30º to 45º unless clinically contraindicated in patients receiving mechanical ventilation, as well as patients at high risk for aspiration

Minimize pooling of secretions above the endo-tracheal tube cuff by using an endotracheal tube with subglottic suction capability in patients with anticipated intubation greater than 48 to 72 hours Change ventilator circuits only if visibly soiled; do not change ventilator circuits routinely. [9]

## Methodology

Design: This study was a descriptive cross-sectional survey. Sample a total sample of 126 nurses was collected for the current study, the sample size determined by the Rawsoft sample size calculator. Based on an estimated response rate of 50%, ά =0.05, power =0.95; the estimated population of nurses in Iraq/ Babylon is 200, so the required sample size is estimated to be 120. The current study used a larger sample to enhance the results' external validity.Inclusion Criteria -Undergraduate nursingschool,setting and Participants a convenience sample of graduate nurses was obtained from eighthospitals throughout Babylon. The study was approved by the ethics committees of the Babylon health department and the participating.

Researcher used standard a questionnaire that integrated the assessment of nurse's knowledge for prevention of VAP from the Center of Disease Control and Prevention questionnaire was validated by a panel of four specialists in the disciplines of nursing and infection control. The questionnaire comprised two parts. Part one included demographic items such as gender and geographic, Part two comprised 20 multiple-choice questions, each containing four choices: the correct answer and three distracters. The four choices included "I don't know" as an option to prevent guessing. For scoring purposes, the questions were graded as 1 for the correct answer and 0 for other responses. Individual totals for the 20 could thus range from 0 to 20, a higher score indicating a better knowledge level and a score below 10 meaning that the nurses failed the test.(Aloush & Qadire, 2017)

**Data collection procedure:**

The questionnaire was administered to the participants in their hospitals by the principle investigator. Nurses were informed that their completion of the questionnaire would be considered as consent to participate. Nurses were assured that participation is completely voluntary and that their responses in the questionnaire were confidential. The nurses also were informed that they had the right to withdraw from the study any time. The nurses were subject for any emotional, physical or mental harm as a result of participation in the study. Data were collected in the period April -August 2018.

## Statistical Analysis

SPSS version 22 was used for data analysis. The mean scores and frequencies were calculated. An independent sample t-test was used to measure the difference in mean scores between male and female participants and between nurses with previous education in their training courses about VAP management and mechanical ventilators and those without. An ANOVA test was conducted and the difference in mean scores was compared among nurses according to the geographical location of the hospital.

## Results of the Study

Researcher distributed 140 questionnaires, of which only 126 were completed, a total response rate of 98%. Respondents were of different geographical locations and gender. Participating hospitals were of government affiliation. The mean age of participants in the study was 24.6 (SD=2.9) for females and 23.7 (SD=2.7) for males. (Table 1)

**Table 1. Nurses' characteristics**

| Items | | Frequency | % |
|---|---|---|---|
| 1 | Gender<br>Female:<br>Male: | <br>66<br>60 | <br>52<br>48 |
| 2 | Hospitals location<br>Center of Babylon:<br>Peripheral ofBabylon: | <br>78<br>48 | <br>61.9<br>38.1 |
| 3 | Received educational program and training on Mechanical ventilator in their undergraduate courses.<br>Yes:<br>No: | <br>64<br>62 | <br>50.8<br>49.2 |
| 4 | Received educational program and training on Ventilator Associated Pneumonia (VAP) management in their undergraduate courses<br>Yes:<br>No: | <br>65<br>61 | <br>51.6<br>48.4 |

**Table 2.Preferred guidelines and frequencies of correct answers Preferred:**

| | Preferred guidelines and frequencies of correct answers: | n(%)/ n=126 |
|---|---|---|
| 1 | Which method of endotracheal tube insertion is preferred to decrease VAP? | 54(42.8%) |
| 2 | How often is it preferred the ventilator circuits be changed to decrease the risk VAP? | 61(48.4%) |
| 3 | Which type of humidifiers is preferred to decrease the risk of VAP? | 75(59.5%) |
| 5 | How often is it preferred the humidifier be changed to decrease the risk VAP? | 68(53.9%) |
| 6 | Which type of suctioning systems is preferred to decrease the risk VAP? (open vs close) | 45(35.7%) |
| 7 | How often is it preferred the suction systems be changed to decrease the risk VAP? | 69(54.7%) |
| 8 | Which type of endotracheal tube is preferred to decrease the risk of VAP? | 71(56.3%) |
| 9 | Which type of bed is preferred to decrease VAP the kinetic bed vs the standard bed? | 44(34.9%) |
| 10 | Which patient position is preferred to decrease the risk VAP? | 65(51.6%) |
| 11 | Which solution is preferred for oral care to decrease the risk VAP? | 61(48.4%) |
| 12 | How often oral care is preferred to decrease the risk VAP? | 47(37.3%) |
| 13 | How often is it preferred to assess patient readiness for extubation? | 75(59.5%) |
| 14 | How often is it preferred to perform spontaneous breathing trial with sedatives turned off? | 68(53.9%) |
| 15 | When is it preferred to wash hand to decrease the risk of VAP? | 45(35.7%) |
| 16 | When is it preferred to wear gloves to decrease the risk of VAP? | 69(54.7%) |
| 17 | At which level endotracheal tube cuff pressure should be kept to decrease the risk of VAP? | 71(56.3%) |
| 18 | To decrease the risk of VAP, which of the following practices related to antibiotics use is preferred? | 44(34.9%) |
| 19 | What is effect of giving peptic ulcer prophylactic (e.g. H2 blockers, Proton pump inhibitors, or sucral fate) administration on the risk of VAP? | 65(51.6%) |
| 20 | What is the effect of Deep Venous Thrombosis (DVT) prophylaxis on the risk of VAP? | 61(48.4%) |

The mean knowledge score for participants was 6.4 (32%) (SD=2.9), with a range of 16 (80%) to 0(0%).63 nurses (14.5%) answered more than half of the questions correctly. Weakness in the knowledge related to mechanical ventilator management was obvious. The majority of the nurses didn't know that the mechanical ventilator humidifier must be changed weekly to prevent VAP, the endotracheal tube's cuff pressure must be kept at the level of 20-30 H2O, and that the ventilator circuit must be changed only when it is visibly soiled or for every new patient's admission. Another topic of concern was oral care and suction. On the other hand, students showed a reasonable level of knowledge regarding hand washing and patients' positioning. (Table 2).

**Table 3. Nurses' scores vs. baseline characteristics**

| | | Nurses Scores out of 20 | | |
|---|---|---|---|---|
| **Items** | | **Mean (SD)** | **t** | **p** |
| 1 | Gender<br>Female:<br>Male: | 6.42(2.8)*<br>6.44(2.9) | 0.2 | 0.93 |
| 3 | Received educational program and training on Mechanical ventilator in their undergraduate courses.<br>Yes:<br>No: | 6.9(2.8) 5.9(2.9) | 2.1 | 0.00 |
| 4 | Received educational program and training on Ventilator Associated Pneumonia (VAP) management in their undergraduate courses<br>Yes:<br>No: | 6.4(2.9) 6.6(2.9) | 1.9 | 0.014 |

There was a statistically significant difference in knowledge scores between nurses who had received education in VAP on their undergraduate courses and those who had not: t (432) =-3.5, p=0.00. However, both groups revealed poor knowledge, The former achieved higher scores (M = 6.9, SD =2.8) than the latter (M =5.9, SD =2.9 ). There was no statistically significant difference in the scores of male and female nurse, and no statistically significant difference between nurses who had been taught about mechanical ventilators and those others who had not (p >.05) (Table 3).

## Discussion

Participants had a poor knowledge of VAP-prevention can be compared with other nurses that showed poor overall knowledge about infection control guidelines among student nurses in India, Iran and Spain however, my study was more comprehensive as it focus only on VAP prevention guidelines also it provided a broader set of updated VAP prevention guidelines . Mechanical ventilator management, oral care and the endotracheal tube suction items were the major topics of concern among our nurses, again similar to the findings from another study with student nurses in Spain and with newly graduated nurses in United States. On the other hand, participants showed much better knowledge about hand hygiene and the Semi-Fowler position than about other topics, although their performance was still unsatisfactory.

## Conclusions

The study conclude that the mean age of participants in the study was young and female,the majority of the nurses didn't know that the mechanical ventilator humidifier must be changed weekly to prevent VAP,There was a statistically significant difference in knowledge scores between nurses who had received education in VAP on their undergraduate courses and those who had not. Researcher encourage all Iraqihospitals ICUs nurses to involve inclinical training to improve nurses acquisition and to evaluate the content of the nursing curricula to identify shortcomings in content. It is imperative that VAP-prevention guidelines be integrated in training and teaching within the nursing schools, and that the content and teaching strategies of infection control courses are updated. The findings from

this study may be used as a reference to evaluate the effectiveness of educational interventions in the future

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

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# Skill and Capacity of Women through Social Mobilization: Analysis of Urban Women Self Help Groups in Coimbatore City

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## Abstract

The study attempts to understand and anlayse the skill and capacity of women through social mobilisation. It is proved that the Self Help Groups (SHGs) played a key role in mobilizing the poor towards developing the habit of saving and avail credit from financial institutions. Social Mobilisation has been adopted as an appropriate approach to mobilise the local communities which is essential to carry out any intervention. The main objective of the study is envisioned to identify the enhancement of skill and capacity of the women through social mobilization. The methodology for the study is Survey research and describes the skills and capacities of the women of Urban SHGs. Multi stage sampling was employed to collect data from 14 SHGs comprising of 156 SHG members. The results revealed that participation of group members in SHGs increase their literacy skills, communication skills, banking skills and vocational skills. Also it is evident that a vast majority of the women (77.6%) do not have any vocational skills which indicates there is huge need of training women in vocational as well as entrepreneurship skills to generate income.

***Keywords:*** *Self-help groups, social mobilisation, skills and capacity of women, urban women*

## Introduction

The idea of social mobilization, is bringing together people from all sections of the community to increase awareness and plea for specific development programme and support the community for sustainability and self-reliant[(1)]. It can be categorized as community development approach which involves the people actively to address basic reasons of mal development. In the process it gives opportunity to fight for their rights and increase their potential to mobilise resources, network and connect for their betterment[(2)]**.** There are number of studies how social mobilization influences women empowerment. [(3,4)] Particularly on how the self-help groups(SHGs) for women living in urban slums can be an effective tool for social mobilization and eventual empowerment. SHGs main purpose is to enable economic empowerment by imparting skill development to gain power and improve their personality to tackle challenges in life [(5)]

Moreover, women need to avail credit facilities, making avenues for political participations; equal educational opportunities alone would not automatically empower them but they play a major role in women empowerment[(6)]. SHGs alone will not be the solution to women empowerment, additionally the secondary level SHGs Federations ensures the sustainability of the SHGs[(7)]. In certain cases, it is proved that the financial stability has a key role in economic development which results in social well-being. Moreover, there is no single way or panaceas to empower women; it is a different facet which necessitates a variety of approaches for empowering women[(8)]. Empowerment of women and poverty alleviation is generally facilitated by various institutions such as bank, SHGs and NGOs[(9)]. When income inequality becomes more pronounced it creates adverse effects on physical and mental health. Inequality creates an adverse view on one's health and

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creates deterioration in mental health[10]. SHGs are predominantly considered as agencies of empowerment of weaker sections especially women in India; it helps improve livelihood and resolve various health issues[11][12].

In most cases, it is proved that the SHGs played a key role in mobilizing the poor towards developing the habit of saving and avail credit from financial institutions[4]. Also in the recent few decades SHGs promote social mobilization and social accountability aimed to improve the health and nutrition[13]. Social Mobilisation has been adopted as an appropriate approach to mobilise the local communities which is essential to carry out any intervention[14]. There are strong evidences on SHGs having positive effects on social, economic and political empowerment[15][16]. Though there is a visible way forward for women empowerment we still have a long way to head towards empowerment. Women are a part of the society and they play a significant role in determining the future of the nation[17]. The sustainability of the group is prime concern among stake holders of organizing SHG[18]. Moreover the federations of SHGs promotes sustainability and resolves issues in terms of financial provisions[19].

Social mobilisation has to provide a platform for open dialogue, conduct negotiation and reach a consensus on the means of action for sustained living and self –reliance. It deals with probing the felt needs of the community, addressing the real issues than focusing on a slice of reality. This study is an attempt to understand the improvement in skill and capacity of women; resulting in a specific process of change while at the same time resulting in acquisition of material benefits[1].

## Objective

The research is envisioned to identify the enhancement of skill and capacity of the women through social mobilisation. The results of the process of social change consequential to social mobilization in terms of residence, occupation, roles and capacities has also been identified.

## Method

The present research is carried out by Survey research method and describes the skills and capacities of the women of Urban SHGs. The primary data is collected through field survey from Women Self-help groups of Coimbatore urban limit. Multi stage sampling was employed to identify the SHGs that met the objectives of the research. The process of multi stage sampling was carried out by dividing Coimbatore city into 5 zones namely East, West, South, North and Central. In the next stage, SHGs were classified into three stages based on the number of years such as young, middle and old groups and SHGs were selected proportionately representing each zone which resulted in 14 SHGs.

## Findings

The study aims to understand the skill and capacity of women through social mobilization. The data was collected between May 2019 and October 2019 from 14 SHGs comprising of 156 SHG members. The findings of the study reveals that more than half (60.9%) of the respondents' are from single families while one fourth (25.6%) of the are from Nuclear family and 13.5% are joint family. The dwindling rates of joint family system is indicative of the characteristic of the urban areas. 78.8% of the respondents are from Backward class, 14.7% belong to the Scheduled caste whereas 5.8% of the respondents are from the most backward class and only 0.6% belong to other castes. More than half (58.3%) of the respondents have their own house and 41.7% respondents live in rented houses. A good majority, i.e., 89.1% of the respondents 'are residents of Coimbatore city, 5.8% of the respondents live within the limits of Coimbatore district, 3.8% of the respondents are from other district in Tamil Nadu and only 1.3% of the respondents are from other state. Nearly three fourth (74.4%) of the respondents live in Semi Pucca house [Semi Pucca refers to a house which is roofed with tiles or Asbestos sheet], 7.7% of the respondents live in Kutcha house [Kutcha house means hut, damaged house with improper roofing, tent, tin roofing etc.,] and 17.9% of the respondents live in Pucca house [Pucca refers to a modest concrete roofed house]. Majority of the (83.3%) respondents are Hindus, 12.2% are Christians and only 4.5% are Muslims. Most of the SHGs have people belonging to different religion in their group.

## Discussion

Several studies have proved that the SHGs have the potential that goes past not merely access to credit but various other avenues to improve their skills in terms of literacy, communications skills, banking skills and vocational skills. The SHG approach promotes conditions to improve the status of women as group[20].

*Skills and capacity of women:*

Majority of the women (73%) are highly literate (Reading and writing Skills) and 27% of the respondents are literate (signature only) and only 1% is illiterate. As the women get opportunity to become literate after joining Self Help Groups, a good percentage of women become literate after joining SHGs while very less percentage of women do not try to improve their writing and reading skills because the feel that they have aged and it is not required now. Communication skills have been classified based on their ability to meet government officials, political leaders and to speak in public meetings to express your views and opinions. The study revealed that 60.9% respondents have high communication skills, 32.7% have poor communication skills and 2.6% of the respondents have moderate communication skills and only 3.8% of respondents do not have any communication skills. In the modern era the banking skills are very important, the banking skills has been classified as ability to open an account in a bank/post office, deposit money, withdraw money and borrow loan from bank. The study revealed that 73.1% of the respondents have high banking skills, 1.9% respondents have moderate banking skills, 2.6% of the respondents have low banking skills and only 22.4% of the respondents do not have any banking skills. Vocational skills are essential for income generation which is a major responsibility of the mobilization process. In this study woman having any one kind of vocational skill has been categorized as having vocational skills and those who have no skills as no vocational skills. In this study majority of the women were skilled in Tailoring, while a meager percent was skilled in toy making and beautician. The study shows that 77.6% of the respondents do not have any vocational skills and only 22.4% of the respondents have vocational skills.

Table number 1 shows the detailed frequency and percentage of the respondent's skills and capacity of SHG members.

**Table 1: Skills and capacity of SHG members**

| S.No | Contents | Frequency | Percentage |
|---|---|---|---|
| i) Literacy | | | |
| 1 | Illiterate | 2 | 1 |
| 2 | Literate | 40 | 26 |
| 3 | Highly literate | 114 | 73 |
| | Total | 156 | 100.0 |
| ii) Communication Skills | | | |
| 1 | No Communication skills | 6 | 3.8 |
| 2 | Poor Communication skills | 51 | 32.7 |
| 3 | Moderate communication skills | 4 | 2.6 |
| 4 | High communication skills | 95 | 60.9 |
| | Total | 156 | 100.0 |
| iii) Banking Skills | | | |
| 1 | No banking Skills | 35 | 22.4 |
| 2 | Low Banking Skills | 4 | 2.6 |
| 3 | Moderate Banking Skills | 3 | 1.9 |
| 4 | High Banking Skills | 114 | 73.1 |
| | Total | 156 | 100.0 |
| iv) Vocational Skills | | | |
| 1 | Having vocational skills | 35 | 22.4 |
| 2 | No vocational skills | 121 | 77.6 |
| | Total | 156 | 100.0 |

The table number 2 shows the association between ownership of house, poverty status and type of house of the respondents. There is a significant relationship between the ownership of the house and the type of house that they live in. The table conveys that majority of the respondents live in semi pucca houses. 94.5% of the respondents who own their house live in Semi pucca and pucca houses. There is significant association between poverty status and the type of house in which they live. 78% of the respondents living below poverty line live in semi pucca houses. This indicates that in spite of the respondent's habit of saving money and depositing it monthly or weekly, they still find it difficult to build a good habitable house. The money that they save might be from the income of their husband or children. The women who go to work also have been employed in low paid jobs and jobs which are not stable. In addition to the savings habit the women need to be trained in various income generating activities which will enable them to come out of the poverty cycle and eventually improve their standard of living.

**Table 2: Association between Ownership of House, Poverty status and the type of house they reside**

| S. No | Ownership of house | Type of house | | | Total | Significance X2 |
|---|---|---|---|---|---|---|
| | | Kutcha | Semi Pucca | Pucca | | |
| 1 | Owned | 5 | 62 | 24 | 91 | 11.147 |
| 2 | Rented | 7 | 54 | 4 | 65 | Df = 2 |
| | Total | 12 | 116 | 28 | 156 | P = .004 |
| | Poverty status | | | | | |
| 1 | Below Poverty Line | 12 | 111 | 19 | 142 | 22.671 |
| 2 | Above Poverty Line | 0 | 5 | 9 | 14 | Df = 2 |
| | Total | 12 | 116 | 28 | 156 | P = .000 |

The table number 3 shows that there is no association between poverty status and their vocational skills. Though a majority of the poor have skills in vocational trade, the individuals are not willing to pursue their goals. The individualistic principle advocates that the interests of the individual have to achieve precedence over the state. Hence the individuals though belonging to a particular self-help group has to be ruled by a set of self-driven goals. This may be a reason for the lack of economic growth among poor, in spite of being trained in vocational skills[10]. Also merely vocational skills training would not help to improve the livelihood but in addition it should earn income through vocational skills. Most of the women SHG members have tailoring skills which is not sufficient to earn livelihood. This indicates that SHG members are required to be given viable business entrepreneurship skills through which they can improve their livelihood. There are several opportunities for vocational training but still women choose tailoring as an option for vocational training, which has very less potential to generate income; unless they start a garments unit to scale their business.

**Table 3: Association between Poverty status and their vocational skills**

| S.No | Poverty status | Vocational Skills | | Total | Significance X2 |
|---|---|---|---|---|---|
| | | Having vocational skills | No vocational skills | | |
| 1 | Below Poverty Line | 30 | 112 | 142 | 1.558 |
| 2 | Above Poverty Line | 5 | 9 | 14 | Df = 1 |
| | Total | 35 | 121 | 156 | P = .212* |

*Not Significant

## Conclusion

The present study suggests that the participation of group members in SHGs increase their literacy skills, communication skills, banking skills and vocational skills. The process of group meeting, attending various awareness training programmes increases their confidence in communication skills. The banking skills are indispensable to every member in the SHG to claim financial benefits from the Banks; financial transactions by group members deliver greater chances of acquiring the banking skills. Vocational skills play a vital role in improving the livelihood of women. From the study it is evident that a vast majority of the women (77.6%) do not have any vocational skills which indicates there is huge need of training women in vocational as well as entrepreneurship skills to generate income and improve their material conditions of living.

**Conflict of Interest:** The authors declare that they have no conflict of interest to disclose.

**Source of Funding.** The authors have no funding for this study.

**Ethical clearance:** Ethical Clearance obtained from the Human Ethics Committee.

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# Fluorosis: An Endemic Disease

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## Abstract

A study is conducted to assess the cases of fluoride affected person in selected gram panchayat ,Tonk ,Rajasthan. This study is conducted as perspective to conduct action research after wards. In This study symptoms of fluoride has been categorized in three type of fluorosis skeletal( SKF ),non skeletal fluorosis (NSKF ) and dental fluorosis (DF).In this study villagers between the age group 10-70 years were observed for the presence of fluorosis symptoms by researchers. Conclusion of the study is level of fluoride in the water or food and crops grown in that majorily has caused non skeletal fluorosis ,50% people are affected severely ,2% population study sample has developed severe skeletal fluorosis ,56% sample is affected with dental fluorosis at moderate level among which children are more affected .after conducted assessment of fluorosis symptoms in fluoride endemic district ,researcher has given health education to study sample and discussed many nutritional and environmental manipulations which can decrease the level of fluoride in human body as well as in ground water level

***Key Words:*** *Dental Fluorosis, Skeletal Fluorosis, Non Skeletal Fluorosis, Fluoride*

## Introduction

Fluorosis is a disease of oral, skeletal and non skeletal dysfunction which arises due to increase fluoride **level >1.5mg /liter** in ground water and increase fluorine gas in atmospheric air[3] . In North India **Rajasthan** and Gujarat and in South India Andhra Pradesh are **highly endemic** areas. Punjab, Haryana, M.P, Maharashtra are moderately endemic areas. Tamilnadu, West Bengal, Uttar Pradesh, Bihar and Assam are mildly affected endemic area of fluorosis . Fluorosis is essentially Hydrofluorosis except in parts of Gujarat and UP where industrial fluorosis also seen Which is due to fluoric acid compounds. The food and crop which is grown locally among fluoride endemic area is also found to have very high fluoride level (Richa Miglani ,2018). **WHO** has classified FLUOROSIS among 3 categories DENTAL FLUOROSIS, SKELETAL FLUOROSIS, NON SKELETAL FLUOROSIS, In **Non Skeletal Fluorosis** GIT system shows Acute abdominal pain, Diarrhea,Constipation , blood in Stool , Bloated feeling (Gas) , Tenderness in Stomach, Feeling of nausea. Nervous system when affected with high fluoride concentration shows **NERVOUSNESS & DEPRESSION,** tingling sensation in fingers and toes, Excessive thirst and tendency to urinate ,Frequently Polydypsia and polyuria control by brain appears to be adversely affected. Some studies reported infertility in humans and menstrual disturbance in women is also observed due to effect of high fluoride level on thyroid gland.

Research Reviews suggests that high fluoride more than 10mg/liter in drinking water and daily activity for prolong period of time can also affect skeletal system which is termed as **Skeletal Fluorosis[3]** causing multiple bone and joint pain, tingling ,burning and pricking sensation in limbs ,chronic fatigue ,muscle weakness. Changes can be observed in spinal column and pelvis. In later stages osteoporosis and bone spur can be developed and crippling Skeletal Fluorosis is also observed due to fusion of vertebra and bones. Dental fluorosis occurs

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due to exposure to fluoride during mineralization; fluoride replaces the hydroxyapatite crystals in teeth and gets deposited as fluorapatite crystals, which becomes clinically visible as dental mottling. Mottling of the teeth is usually seen in younger children who are developing their front teeth. Excessive fluoride also replaces the hydroxyl groups present in the hydroxyapatite crystal of the bone, forming fluorapatite. This has large crystal size due to which the bone becomes brittle and susceptible to fracture risk. Moreover, young bones retain more fluoride than older bones. Clinical manifestations of fluorosis may be aggravated by malnutrition, specifically calcium and vitamin D nutrition status which is evident from the high incidence of crippling deformities in poor residents from endemic fluorosis zones [5] in dental fluorosis tooth enamel starts

## Material and Method

The Research Design study for the present study is descriptive in nature which emphasize on prevalence of symptoms of Fluorosis among the person who are consuming fluoride water for more than 10 years regularly. Multi stage sampling is done. Village is divided in to Dhani non randomly and then 3 Dhanis are selected randomly among that all person in the age group10-70 years are interviewed from self structured questionnaire checklist for identification of fluorosis in an endemic area. Privacy of all participants is maintained as part of ethical consideration while interviewing. 100 persons were observed for presence of symptom related to fluorosis on the basis of pre validated self structured questionnaire check list given below. A health talk program was organized in which caused of fluorosis, identification of fluorosis, environmental manipulation such as tulsi (osmium) plant [2],diet modification such as antioxidant rich food, vitamin C rich diet and treated water benefits are discussed .

Findings- Descriptive Statistics reveals that among all type of **Fluorosis Non Skeletal Fluorosis** has affected severely to 50% villagers, 24%villagers are moderately affected ,18% villagers are mildly affected with NSKF and 8% have no problem related to NSKF. The Picture of skeletal fluorosis is seen severely in 2% cases which are already diagnosed for fluorosis,17%villagers showed moderate level ,73% showed mild level of SKF which is for pain some joints some time and sound coming after movement of those joint and 8% do not have any problem in skeletal system. **Dental Fluorosis** was seen moderately among 56% sample especially in age group 31-50, 25% were mild Cases, 19% were having no dental problems.

**Table1.1 Findings of selected socio-demographic variables**

| S.no. | Name of Socio Demographic Variable | Classification | Frequency and percentage n=100 | |
|---|---|---|---|---|
| 1. | AGE | a) 10-31<br>b) 31-50<br>c) 50-70 | 42<br>34<br>24 | 42%<br>34%<br>24% |
| 2. | Gender | a) Male<br>b) Female | 64<br>36 | 64%<br>36% |
| 3. | Education | a) Illiterate<br>b) Primary<br>c) Middle<br>d) matric<br>e) Sr. sec.<br>f) Graduate<br>g) Certificate/diploma<br>h) Post graduate | 19<br>16<br>18<br>15<br>6<br>9<br>12<br>5 | 19%<br>16%<br>18%<br>15%<br>6%<br>9%<br>12%<br>5% |

***Cont...*** **Table1.1 Findings of selected socio-demographic variables**

| | | | | |
|---|---|---|---|---|
| 4. | Duration of consuming fluoride water | a) 10 years<br>b) 15 years<br>c) 20 years<br>d) 25 years<br>e) more than 25 years | 14<br>22<br>30<br>19<br>15 | 14%<br>22%<br>30%<br>19%<br>15% |
| 5. | Source of water | a) Well<br>b) Water plant<br>c) Pond | 66<br>12<br>22 | 66%<br>12%<br>22% |
| 6. | Occupation | a) Farming<br>b) Business<br>c) Labor<br>d) Private job<br>e) Govt. job<br>f) Dependent | 25<br>23<br>19<br>14<br>4<br>15 | 25%<br>23%<br>19%<br>14%<br>4%<br>15% |
| 7. | History of smoking | YES<br>NO | 44<br>56 | 44%<br>56% |
| 8. | Conservation of rain water at home | YES<br>NO | 2<br>98 | 2%<br>98% |

## Discussion

Data Suggests That NSKF is more prevalent among villagers. adults in age group 31-50 have developed dental fluorosis as well as non skeletal fluorosis .skeletal fluorosis is seen in elderly in complicate stage .only a few persons after leg deformity diagnosed with history of fluorosis. Significance related to consumption of fluoride drinking water more than 20 years and source of water well and pond suggests that these are the major contributory risk factor for fluorosis.

## Conclusion

Researcher conclude that people who are drinking fluoride water more than 10 years will develop fluorosis symptoms which will turn in to life threatening issues paraplegia, sclerosis, osteoporosis. .use of filtered water, supplied water and environmental manipulation [2] can decrease the fluoride level in ground water.

**Conflict of Interest** –None

**Source of Funding**- By Self

**Acknowledgment** –We are really thankful to hospital medical and nursing staff who had directly and indirectly contributed in our research.

**Ethical Clearance** – Informed consent has been taken up by all participants and Sarpanch has given permission to conduct the Study .

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# Family Interaction Pattern in Wive's of Alcohol Dependents

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## Abstract

Introduction: Alcoholism is a disease which affects the individual and their family hence it is known as a family disease. Alcoholism reflects on the family bonds and it often leads to the complete breakdown of the entire family. The most affected persons are the wives of alcoholics because of their commonly nature and the intimacy in their relationships. The spouses of alcoholics facing severe domestic, financial and emotional violence which leads major psychological problems like anxiety, depression and poor self-esteem. Family interaction pattern (FIP) is defined as methods by which members of the family relate to each other through various mechanisms binding them in the bond of family.

Aim: This research work has made an attempt to study the Family interaction pattern in wive's of alcohol dependents. This study to measure the level of family interaction pattern and significant factors associated with wive's of alcohol dependents of Kottayam district of Kerala, India. Result: Nearly half of the respondents (37%) have medium level of Family interaction pattern. 33% have high family interaction pattern and 30% have low level of family interaction pattern. The study reveals that FIP Score has significant difference with the variables like age, area of residence, education and duration of drinking habit in spouses. The post hoc test indicates that respondents between the age group of 31-40 years, rural area of residence, educated below $10^{th}$ standard and above 10 years of drinking habit in spouses have better FIP. Religion, type of family, occupation and family monthly income has no significance. Conclusion: This study inspires in realizing the mental, social, marital and family relation among wive's of alcoholics and it will be a great help in promoting family counselling programmes in de- addiction centres.

***Key words:*** *Alcoholism, Alcohol dependents, Wives, Family interaction pattern*.

## Introduction

Alcoholism is one of the major health and social problems around the world, which results in 3.3 million deaths in every year (WHO, 2018)[1]. Alcohol consumption is the world's third largest risk factor for several disease and disability in the world today. Since India has the second largest population in the world the magnitude of the problem of "Alcoholism" is also very high in India, and as per WHO 33% of India's population is alcoholics. It is also seen an annual rise in the number of people who use alcohol (WHO, 2010)[2]. Alcoholism is a major cause of mental, social, family and health problems in Kerala. The state of Kerala has the highest per capita alcohol consumption in India, at over 8 litres per person per year[3].

Alcohol addiction can be considered as a family problem and this contributes to the increased stress in the family. Family failure and breakage due to alcoholism is a serious pervasive social issue. Alcohol is connected with domestic violence, low satisfaction in the relations, relationship conflicts, under care of children, legal and economic issues, disrupted family interaction etc. and some also results in physical and psychological illness[4]. Researcher observed that the

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actual sufferers are the members of family who depends upon the alcoholic, particularly the spouse. The wives of alcoholics often shows many mental and physical problems, their social involvement will be very low and low level of marital satisfaction. Even these people have very bad communication level also[5]. The spouses of alcoholics have psychological issues in various adaptive and maladaptive coping mechanisms, to restore the equilibrium and to relieve stress.

Family is the basic and fundamental part in the society. And several families contribute to form a society. The health of a nation can be measured only in terms of health of a family. Addiction affects mostly the spouse in the family as the family income is spent on liquor and the spouse is compelled to manage family finance and needs. There exist fear and uncertainty which leads to lack of self- esteem and self- confidence. Spouses of alcohol dependent person may have feelings of guilt, shame, anger, fear, grief, avoidance of social contacts and isolation due to the presence of an alcohol dependent in the family. They are often subjected to moderate to severe form of harassment. Conflict and tense atmosphere arises when they confront the drinking behaviour of their alcohol abusing family member. The problems that arise as a result of alcohol abuse is numerous, which includes long absences from home, destroying house hold and domestic items, no communication, isolation, domestic violence etc. these people are least bothered of the happenings in their family.

Alcoholism of husband results in the change in the interaction patterns of the wife and causes an alteration the complexion of family environment by financial resources of the family which intern results in the dysfunction of several other areas. The heavy stress experienced by wife in dealing with the pressure of her husband will always influence their marital life negatively. Almost all of the alcoholic dependents and their spouses agree that the main factor of marital happiness is related to family interaction and interpersonal relationship[6].

**Family interaction patterns** are defined as those socio-psychological transactions occurring in the family as system to evolve processes for decision making, emotional expression, personal views, assigning tasks and social status, enabling the family members to contribute to the growth of the family by generating morphogenesis at emotional, intellectual, and social levels by manipulation of external and internal milieu of the family as a whole. From the evolutionary point of view, every family has patterns of leadership, communication, role, reinforcement, cohesiveness and social support constituting its functioning.

Reinforcement: process adopted by the family to enable the members to imbibe socially approved behaviour. Social support system: manipulation of internal and external social milieu of the family for its existence and growth. Role: socio culturally prescribed and ascribed tasks to be performed by different family members according to their age and sex. Communication: Communication within the family is extremely important because it enables members to express their needs, wants, and concerns to each other. Cohesiveness: processes adopted by the family for a firm degree of mutual trust and interpersonal commitment. Leadership: A family member engaged in decision making through consensus for growth of the family, as a system is the leader of the family[7].

The researcher visited various De-addiction centres in Kottayam district, Kerala and interacted with the spouse of alcoholics during the Al-anon programme (Al-anon group is a worldwide fellowship that offers a programme of recovery for the families and friends of alcoholics, whether or not the alcoholic recognizes the existence of a drinking problem or seeks help)[8] and family counselling. The interaction with spouses and discussion with family counsellors of the de-addiction centres helped the researcher to find out the family interaction pattern of the respondents. Researcher came to know that the impact of alcoholism on marital family functioning and influences the family interaction.

## Methodology

This paper is based on standardized scale and the data was collected with an interview schedule from wives of alcoholic attending family counselling and Al-anon meeting in a De-addiction centre of Kottayam district of Kerala. An interview schedule was used to collect data. Family interaction Pattern Scale (FIPS) developed by Bhatti et al (1986) is used for the study. The research is descriptive in nature. Census method used to collect

the samples. The researcher collected data's from all the respondents who were willing to participate in the study during the period of data collection (July2019 – December 2019). The criterion for selection of the respondents was the wives living with the alcoholics who are under treatment at de-addiction centres in Kottayam District. 200 respondents were included in the study.

**Major Findings:**

The simple percentage of socio demographic data reveals the following information. It is seen that 30% of the respondents are in the 20-30 years age group. Nearly half of the respondents (49%) are Christian. More than half of the respondents (55%) are from rural area. More than half of the respondents (56%) are from nuclear family. Nearly half of the respondents (29%) have Under Graduate education. Nearly half of the respondents (29%) are unemployed spouses (housewives). Majority of the respondents (64%) have family monthly income above Rs.20000. Half of the respondents (50%) have above 10 years of drinking habit in spouses. **Level of Family interaction pattern**

Nearly half of the respondents (37%) have medium level of Family interaction pattern. 33% have high family interaction pattern and 30% have low level of family interaction pattern.

Evidences show that severe alcoholism leads to marital problems and family conflict, and negative emotions and interpersonal interactions often lead to relapses among alcoholics. Stress from family and other relations will motivate them for more drinking. Family members of the alcoholic have medium level of communication as either of the spouses, children or parents is afraid to talk to each other. This is mainly due to the violent nature of the alcoholic where the family members limit their communication so as to avoid problems.

**Factors affecting the Family interaction pattern**

**Table No. 1: ANOVA Test to compare Family Interaction Pattern (FIP) and Socio demographic profile**

| S.No. | Variables | F -value | Table value | Significant/Not |
|---|---|---|---|---|
| 1 | Age | 4.230 | 3.883 | ** |
| 2 | Religion | 0.196 | 3.048 | NS |
| 3 | Area of residence | 4.052 | 3.048 | * |
| 4 | Type of family | 0.946 | 3.042 | NS |
| 5 | Education | 3.482 | 3.113 | ** |
| 6 | Occupation | 0.662 | 2.418 | NS |
| 7 | Family monthly income | 0.915 | 3.042 | NS |
| 8 | Duration of habit in spouse | 4.144 | 3.883 | ** |

NS-Not significant, * -Significant at 5% level, ** -Significant at 1% level

1) FIP Score has significant difference with age. The post hoc test indicates that respondents are between the age group of 31-40 years have better FIP.

This study revealed that the family interaction pattern is more significant in spouses of alcoholics with age groups of 31-40 years than other age group. It is because couple's given more concentration to their young children and when the child grown to teenage or above they leaves the home for studies, job.

2) FIP Score has significant difference with Area of residence. The post hoc test indicates that respondents who are from rural area of residence have better FIP.

The National Family Health Survey 2015-16(NFHS-4) reveals that the consumption of alcohol is higher in rural area than urban area in Kerala[9]. The study revealed that the FIP is significant in rural area than urban and sub urban areas. The significance is due to the influence of social support and interaction among the neighbours is higher in rural area than urban and sub urban areas. The women in the rural areas are gathering together once in a week for the "Kudumbashree Meeting" (a poverty eradication mission by Government of Kerala) which help them to share their problems with the peer group and find the solutions for the same.

There is a need of detailed study among the rural populations, mainly family centered people in order to have in-depth knowledge. On their particular needs and to contribute more to adopt public health measures for preventing these issues and promoting health and psychological rehabilitation. The problem of excessive alcohol consumption is a major cause of public health concern both in urban and rural areas.

3) FIP Score has significant difference with education. The post hoc test indicates that respondents were educated up to 0-9 standard (below 10$^{th}$ standard) has better FIP.

The FIP is higher in respondents below 10$^{th}$ standard education than the educated wives. As most of the respondents are from rural area, the culture of the society is more family oriented. The less educated respondents are more flexible to adjust with alcoholic habit of their spouses than the educated respondents. Hence the FIP is higher in this category. Some of the high income individuals are not highly educated. They are into business and earn lakhs of rupees and hence were found to lead a comfortable life with the satisfaction given by money[10].

4) FIP Score has significant difference with Duration of habit in spouses. The post hoc test indicates that respondents whose husband's are drinking above 10 years have better FIP.

Analysis of the research shows that the FIP is higher in wives of alcoholics whose spouse's drinks alcohol for more than 10 years. On interaction with the respondents the researcher identified that most of the respondent's spouses who drinks alcohol for more than 10years have more responsibility towards the family and spouses gives mental support to the alcoholics as they were adjusted with habit of the spouses. This helped them to reduce domestic violence and quarrels among them.

## Discussion and Conclusion

Family education and family therapy will lead to solve the problem to a certain extent and other important is to educate the community. Adjustmental problem of wives of alcoholics affect their future generation. Mass media- information should be given about the ill effect of alcoholism. Family counselling or 12 steps therapy (Al-anon) will help the wives to recover from adjustmental problem, marital dissatisfaction and family interaction. De-addiction centres suggest a need to study the stress perceived by spouses of alcoholics and these centres recognized spouse of alcoholic's as an important components in the development of personality, marital conflict, maintenance relationship and treatment of psychological problems. Changes in the attitude and behaviour of the wives of alcoholics can be bought through various therapies like individual, family, musical, occupational etc. and also methods like yoga, meditation and relaxation techniques may contribute to their psychological improvement.

## Conclusion

Nearly half of the respondents (37%) have medium level of Family interaction pattern. The study reveals that FIP Score has significant difference with age, area of residence, education and duration of drinking habit in spouses. The post hoc test indicates that respondents between the age group of 31-40 years, rural area of residence, below 10$^{th}$ standard education and above 10 years of drinking habit in spouses have better FIP.

Researcher observed that the social consequences of the wives of alcoholics at the individual level significantly impact on personal life, work related area and family relationship. They experience physical, social, economical and psychological problems like socially isolated, lost status in the society, anxiety, depression, loneliness, worthlessness, fear of being rejected etc. because of their husband's drinking. So many negative social consequences like very low self-esteem, disturbed family, social problems, recreational problems etc. are reported from the wives of alcohol

dependents. It is the responsibility of social workers to use social work intervention techniques and methods (psychotherapy for couples & family members, group therapy, counselling etc.) for improving their self esteem and better family interaction pattern.

· Marital satisfaction and stability is negatively affected because of excessive drinking.

· Discordant alcohol consumption is a prime factor in marital dissatisfaction.

· Treatment for the couples for alcoholism has given better outcome and greater satisfaction in marital life. This has also resulted in less partner violence.

· After family therapy, the openness, warmth, support and relationships became more effective and sharing of responsibilities is seen in the family.

· Practising problem-solving skills and additional behavioural skills help the couples to cope up with relapse episodes[11].

**Ethical Clearance**- Taken from Human Ethics Committee, Dept. Of Social work, Amrita Vishwa Vidyapeetham, Coimbatore, Tamil Nadu, India.

**Source of Funding**- Self

**Conflict of Interest**- Nil

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# Experiencing Foster Care-Happiness and Wellbeing of Institutionalised Children

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## Abstract

The institutionalised children are the most vulnerable group in our society and they show many problems.To improve institutionalized children's protection there is an urgent need to understand the various issues faced by them and find out remedial measures.To ensure the care and protection of institutionalised children,the Kerala state government has launched foster care scheme under the department of women and child development.This study is based on the group discussion by researcher with the institutionalised children who are experiencing foster care.

The objective of the study is to understand the foster care experience of institutionalised children and also understand their happiness and wellbeing during the period of foster caring.The researcher selected focus group discussion method for collecting data.Researcher made two focus group discussion with institutionalised children who are experiencing foster care.The group include six girls and another group contain seven boys. Hence the total respondents were thirteen in number

**Result and Conclusion:**The experience of foster care children from foster families are very positive.They are satisfied with the care,love and facilities which are provided by their foster parents and sibilings.The children can transform their lives during the foster care period.Many children have the wish to return their foster family.

***Keywords:*** *Experience, foster care,happiness,wellbeing,institutionalised children.*

## Introduction

Children's home is an institution established for the protection,education,training and rehabilitation of children in need of care and protection as defined in section 2(D) of the Juvenile Justice Act 2015. These institutions are the home to the children who are in need of care and protection.The children from socially,economically and educationally backward family in our society, homeless children, children released from child labour,street children, children whom were saved by child line are in need of care and protection.The institutionalised children's admission is permitted by the order of the Child welfare committee. These children are most marginalized and vulnerable group in our society. Adequate support and care is an essential component for emotional, mental and physical wellbeing of institutionalised children. During vacation period an alternate care provided for the wellbeing of children .These alternate care is provided in India as per the guidelines of Ministry of women and child development. It is carried out by District child protection unit and the foster care children were placed for foster care by the individual case assement of child welfare committee.

Foster care is the alternate care for children in need of care and protection in the family environment other than the child's biological family. Care giver of foster family is referred as foster parent and they are approved by the state government under the guidelines of foster care system. Foster parents has been selected by child welfare committee. Family has vital role in the behavior modification of children. It is important for the overall development of children. The National Policy for children 2013 said that all children have right to grow

in a family atmosphere which provide love,warmth,care ,happiness and understanding[1].

Fostering is a temporary residential care system for institutionalised children.They live with unrelated or extended family. In this System their biological parents do not lose their parental rights. Foster care is the placement of child till he or she is able to return to their own family. The maximum duration of foster care is one year[2].foster care can provide more opportunity and a better quality of life.

The children who are placed in a foster home shows transformation in their lives. This transformation happens not only in children but also in foster parents. Becoming a foster parent is rewarding and it is a calling for the majority of carers more than a job.Obiviously there are lows and highs, but the positive side of both partners overcome the negatives ones[3].

Foster care provides stability and secure environment,Acadamic stability, family life and strong family contact to the children .Children under foster care intervention had higher level of wellbeing, Attention and positive effect when compared to children who remain in institution[4].Children's future wellbeing only happen within a family environment which provides care, love and affection,happiness.Lack of care caused many behavioural problem in children. The institutional children shows growth suppression, impairement in psychological, emotional and social development when compared to non institutionalized children. The children who are experiencing the foster care can recover from these developmental impairements.A well designed foster care programme can make high quality improvement in institutionalised children[5].

Foster care may be short term or long term depending upon the needs of the child. The duration of the foster care has been based on the individual case assessment by child welfare committee. Based on the individual care plan, institutionalized children in the age group of six to eighteen years shall be placed in foster care. The age group zero to six years will not be considered for placement.They should be considered for permanent adoption.According to the report of U S Department of Health and Human service children's beauro ,In 2015 22 percent of total foster care children were adopted by their foster parents.The parents who are terminally ill couldn't take their children. In this situation also the children should be provided foster care with their permission of their biological parents[6].

In 2018, there are approximately 140 couples and in 2019 approximately 200 couples in Kerala were approved as foster parents by District child protection unit and child welfare committee. The children who are wishing to foster family are sent to different families under the guidelines of Juvenile Justice Act 2015.Foster care can be two month summer vacation programme. But the child and foster parents are interested to extend the period of staying ,the child welfare committee will give permission to extend the duration.Wellbeing is not the state of merely the absence of diseases and also an individual can lead his life with satisfaction. Wellbeing is associated with an individual's physical health ,mental health and resilence,that is the ability to cope with unfamiliar situations.The pleasurable and enjoying moments directly leads to the transformation of institutionalised children.The psycho social intervention method has great influence in the behavioural change of children. Hence the foster care programme helps the wellbeing of children in need of care and protection.

## Methodology

This study was conducted in two children's home under the department of women and child development of Kerala government.One children's home was for boys and another children's home was for Girls.In this qualitative study, focus group discussion was used for understanding the experience of foster care among institutionalized children. Two focus group discussions were held .One group include six girls and another group contain seven boys.Thus the total number of respondents were thirteen in number. The collected opinion from all respondents are reviewed for this study.

From the words of Sukanya (name changed for privacy) thirteen year old girl,researcher understood that she enjoyed the vacation with caring parents and siblings. She experienced the love and warmth of the family during the two month vacation period.Sukanya said that she did not feel loneliness and she got brother and sister from there."when Mom and Pappa went for outings and family functions they protected and loved me as their own child" she said.Foster family provide warmth and moments of enjoyment to foster care children.Because

of their love and affection many children told that they wished to go their foster family again.

Akash (name changed for privacy) eight year old boy said that Mom and Pappa gave him gifts,new school bag ,chapel and dresses .And also they provide enjoying moments during beach trip.“I got a loving elder sister” he said.Appukuttan, (Name changed for privacy) five year old boy came to the orphanage 1year back and his father was a drug addict.Mother abandoned him.The boy was very happy to be with a family.He said,“I like the new house and the new parents promised that they will take me if I study well”.The boy was studying well as he wants to go from children home to the family.“I got new shirt and shoes.My father gave me chappals”.The boy was curious of the things given by the new family.He was in a wonder world seeing all the new facilities and comfort which he never got from his biological parents. Because of the strong bond between the foster care and foster child,some times they couldn’t be separated.The memories of the happy moments make them feel to go back to their foster families.In this situation foster care period may be extended.Foster family also provide academic stability.

Lakshmi(name changed)12 year old girl was sent to teacher’s family who have no children, She liked the place very much and her only concern is that there is no one to play with. She liked the puppy and pussy cat in that home and said.“Teacher dad and Teacher mom got a new pet, and that is me”.Lakshmi is very much attached to the teacher couple and wish to stay back as she has not experienced a familial atmosphere.Lakshmi is a born orphan and she was raised in an orphanage later she was handed over to the children’s home.Lakshmi for the first time in her life came to know what is a “home”and how she would be feeling good and comfort if she had a family.

Selva Kumar (name changed,14 yrs)is a boy from Tamil Nadu who came with his uncle and aunt for coolie works.His biological parents are alcohol addicted and uncle took him with him for manual labour.The child line people saw the boy and was given to the orphanage.“I want to go with a Tamil family.I like Tamil food.The new malayalee parents are good,but I want Tamil People”.Selva Kumar Said.The children home people have promised him to find a Tamil family during the next time.Selva Kumar felt this is a fresh experience where he was fully mingled with a malayalee family consisting of father, mother and two children.There were also grand parents who were strict and asked him to take bath twice a day and also to do prayers in the morning and evening.Keeping this aside Selva Kumar is so happy to have a big house and family and to travel in a car like other children. Foster parents ensured care and security to the children.

Rani(name changed ,6yrs) is the charming beauty of the children’s home. She went with a family having three male children. The parents were longing for a female child and happened to see Rani and they sent their readiness to accept Rani as their foster child, Rani is still in the wonder world. She always wears the dress given by the new parents. From the words of Rani “I got three new friends to play with and the elder brother take me outside in the car”.Rani is so exited to be in the family and she wished to get more brothers like these.“I like the two new brothers,so that I don’t want to do any work”.Foster care helped the institutionalised children to become have a sense of belonging and the feeling of lonliness cleared up in their mind.They experienced the pleasing moments,individual care and learned moral values from their foster family.

Rahman (name changed) fourteen year old boy wished to drive cars and bikes and his dream was fulfilled when his new parents taught him the basic lessons of driving “I want to be eighteen years very soon so that I can get license and my new parents will give me the car”. Now they allowed him to take the car in the courtyard only. “I will study very well and will buy a benz very soon.I want to take my new parents for a ride”.He said this innocent words.Rahman was sent with a family who don’t have a family who don’t have male children. They only had a daughter and she is married and settled in America. They wished to have a child in their home and so they happily agreed to take Rahman with them.Rahman is always explaining how he was treated by the new parents and all other friends wished to see his new parents.He also bought sweets and gifts for his orphanage friends.These parents visit Rahman and also they often call him.They have also promised a trip soon.Through the focus group discussion many of the children told that they want to go back to their foster family again.from their words researcher understood

that the foster care provide the children physical,social ,emotional and psychological wellbeing.The foster parents and sibilings lives in the heart of the children who were taken into foster family.Every pleasurable moments were in their mind. "I got a good family ,next time I wish to go another family ,because I want to experience the happiest moments of various families". Neenu ,eight year old girl said.

## Findings

Foster care is provided to the children who are of the age group between six to eighteen.During these period all children pass through some maladjustment and difficulties.Children's emotional, physical and mental difficulties may clear up completely only with an adequate support system.From the stand point of the child's physical, psychological and social wellbeing proper supportive relationships and environments are very important. Reviewing all cases in this study researcher understood that all children who are experiencig foster care got an opportunity to spend happiest moments with good family.These children got these effective parental care because of the screening of foster family by child welfare committee.when the screening is not carried out,it will negatively affect the children's mental health and over all well being.only when foster parents do their responsibility in effective manner,the children are satisfied to stay with them

The adequate support of child hood has great influence in the wellbeing and health of a person. Children's wellbeing is related with the environment which they live in.The social relationships are also of great importance in the holistic wellbeing of children. The parental care and housing conditions have the vital role in the development of children.

Foster care programme help the homeless children to get housing ,emotional support,and to acquire life skills.Every child deserve a chance at belonging ,safety,happiness and love.Children who are the victim of natural disasters,substance use,trafficked children from economically and socially backward family,street children etc belongs under the umbrella of children in need of care and protection.Providing residential care system such as foster care is a great exposure to the holistic development of these children.It also provide happy moments to foster parents.Through foster care the children got safe,happy,comfortable and healthy atmosphere.The foster parents ensures the safe and comfortable zone to foster children.Thus the level of happiness and wellbeing was higher in foster care children during their fostering period.Many of the children had a desire to return back to foster family rather than their biological family."I can't leave my mother and father,even if my biological mother come back to me,I like to stay with them one more year"sithara(name changed for privacy) said.From her words researcher realized that the warmth, love and affection of foster parents leads the children to become more happy.Foster family gifted the new clothes ,school materials,books and bags to the academic year for children. It gives a lot of pleasure to children and they acquire academic stability. During the conversation with the district child protection officer the researcher reached at the conclusion that there is no bad experience faced by foster children with their foster parents because the DCPCU placed the children only after the detailed enquiry about foster family.

Through these vaccation family, children learn the moral values, sense of belonging and they have an opportunity to know more about how a family function, how to behave while interacting with others and adjust with unfamiliar situations. The warmth of the family provide them all these qualities.In Kerala foster care system is known as "sanadha bhalyam".Sandha bhalyam is very fruitful programme for the happiness and wellbeing of institutionalised children.

## Discussion and Conclusion

Childhood experience is the root of the future health and wellbeing of a person.Institutionalised children face lot of problems.One of the intervention programme is Foster care system.Through foster care children got shelter,clothing and adequate food.Foster care parents provided warmth, love and affection,support,care and gave opportunities for child's over all physical,emotional and mental health development.They ensure vocational training and education based on the interests of the child.Foster family protected the children from abuse ,maltreatment and exploitation.They also provide treatment in emergency situation.Foster care system in Kerala had a great impact on the development of foster children as well as foster parents.Both parties got a lot of pleasure and enjoyment.

**Ethical Clearance**- Taken from Human Ethics Committee, Dept. of Social Work,

AmritaVishwaVidyapeetham, Coimbatore, Tamil Nadu, India

**Source of Funding**- Self

**Conflict of Interest**- Nil

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***Type of article:*** *Original Article*

# Empathy and Interpersonal Relationship among Institutionalized Children

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## Abstract

**Background:** The arena of child vulnerability is taking complex shapes in the new socio-cultural situations .Institution children are those who deserve special care and attention in order to fulfil their basic and secondary needs both with equal importance, which later on make an impact if it's not satisfied. As humans are called as social being there are some expected qualities which makes us to be connected with each other in appositive way both in family and society. Empathy thus makes the people to be connected which further leads to form an interpersonal relationship.

**Aim:** The aim of the study was to assess the level of empathy among the participants and to assess the level of interpersonal relationship also the correlation between empathy and interpersonal relationship among institutionalised children,

**Materials and Methods:** A total of 214 subjects aged 12-18 years were selected for study based on lottery method of Simple random sampling. The study was based on the Questions pertaining to socio-demographic profile of age, gender, mother tongue ,good friendship in the institution, educational qualification, situation before being in the institution ,interest in education and time period for being in the institution. The data collection was done in an interview schedule. The standardised tool used in the study was, the Self-esteem scale developed Life Skills Assessment Scale (LSAS) by A.Radhakrishnan Nair, R.Subasree & Sunitha Rajan. **Results:** The result shows that there is significant difference between the variable, having good friendship in the institution and Empathy also there is a positive correlation between Empathy and Interpersonal relationship.**Conclusion:** The result led to a conclusion that both empathy and interpersonal relationship has a common feature as both has difference in level of measurement among children by analysing its level through different socio demographic variables also there is a correlation between Empathy and Interpersonal relationship.

***Key words:*** *Empathy, Interpersonal relationship, Institutionalized children.*

## Introduction

A study with focus on child institutionalization deserves higher research attention due to the fact that there are a growing number of children who are being seeking this service. The arena of child vulnerability is taking complex shapes in the new socio-cultural situations .Institution children are those who deserve special care and attention in order to fulfil their basic and secondary needs both with equal importance, which later on make an impact if it's not satisfied. Interpersonal relationship is a process which grow and develop throughout our life which forms its basement during the first few years of child's life and later enrich in different stages of developments .Interpersonal relationship is a process which extends in wide range which has to start from ones very close circle such as family, dears and nears, and extends to society. As humans are called as social being there are some expected qualities which makes

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us to be connected with each other in appositive way both in family and society. Empathy and interpersonal relationship can be called as the basic element among them .Empathy always helps to be connected with others and as a result the tendency of caring will also be developed[1].Empathy thus makes the people to be connected which further leads to form an interpersonal relationship.

## Materials and Method

This is a descriptive research conducted among 214 children from different Institutions for Children at Kannur district .Kerala ,India. The samples selected for the study were under the age group of 12-18 years. The sampling technique adopted for the selection of the respondent subjects was by lottery method under Simple random sampling method.

The tool of data collection used for the study was an interview schedule that included questions pertaining to socio-demographic profile and standardised Life Skill Assessment scale developed by A.Radhakrishnan Nair, R.Subasree & Sunitha Rajan[2]. Among the 10 components of life skill the components empathy and interpersonal relationship was assessed, the component empathy and interpersonal relationships have 11 items each.

## Statistical Analysis

ANOVA Test for Comparing Empathy and interpersonal relationship score is based on educational qualification, situation before being in the institution, interest in education and time period for being in the institution. The independent sample T-test was used to compare Empathy and Interpersonal relationship with age, gender, mother tongue and about good friendship in the institution. Chi-Square Test was used to test the correlation between Empathy and Interpersonal relationship.

## Result

The Empathy score was compared by with educational qualification, situation before being in the institution, interest in education, and time period for being in the institution by using ANOVA (Table-1). The independent sample T-test was used to compare Empathy with age, gender, mother tongue and about good friendship(Table-2).The empathy score was high among male children ,children who are 12-15 years old , children who are in secondary schools, whose mother tongue is Malayalam ,those who were studying before being in the institution and those who are interested in studies, also among the children those who are being in the institution for1-5 years and the children those who are having good friendship in the institution. There is a significant difference between the variables having good friendship in the institution and Empathy

Interpersonal relationship was compared with educational qualification, situation before being in the institution, interest in education and time period for being in the institution by using ANOVA (Table-3). The independent sample T-test was used to compare Interpersonal relationship with age, gender, mother tongue and about good friendship in the institution (Table-4). There is no significant difference between any of the variables and interpersonal relationship. But the interpersonal relationship score was high among children under the age group12-15, among boys, those who are in secondary school, children whose mother tongue is Malayalam, those who were studying before being in the institution and those who are in interested in studies, also the interpersonal relationship is high among the children those who are being in the institution for1-5 years and the children those who are having good friendship in the institution.

The correlation test also agrees that there is a positive correlation between empathy and interpersonal relationship.The children who have low level of empathy are also having low level of interpersonal relationship. Those who are having moderate level empathy shows moderate level of interpersonal relationship and children having high level of empathy shows high level of interpersonal relationship, which is significant at 1% (Table-5).

**Table 1: ANOVA Test for Comparing Empathy Score Based On educational qualification,situation before being in the institution,interest in education and time period for being in the institution**

| Variables | Groups | N | Empathy score | | F-vale | P-value | |
|---|---|---|---|---|---|---|---|
| | | | Mean | Std. Deviation | | | |
| Educational qualification | Primary | 33 | 31.33 | 5.15 | 2.435 | 3.039 | Not significant |
| | Secondary | 115 | 33.25 | 4.81 | | | |
| | Higher secondary | 66 | 32.23 | 4.49 | | | |
| Situation before being in the institution | Studying | 181 | 32.86 | 4.60 | 1.846 | 3.039 | Not significant |
| | Working | 4 | 34.00 | 5.48 | | | |
| | Wandering | 29 | 31.10 | 5.73 | | | |
| Interest in education | Interested in studies | 160 | 32.51 | 4.62 | 1.255 | 3.039 | Not significant |
| | Not interested | 6 | 35.67 | 4.23 | | | |
| | Get training in any type of vocation | 48 | 32.69 | 5.39 | | | |
| Time period foe being in the institution | 1-5 years | 137 | 32.40 | 4.96 | .482 | 3.039 | Not significant |
| | 6-10 years | 38 | 32.97 | 4.22 | | | |
| | Above 10 years | 39 | 33.15 | 4.81 | | | |
| | | | | | | | |
| | | | | | | | Not significant |

**Table-2: Significance Test (T-test) For Comparing Empathy with age,gender, mother tongue and about good friendship**

| Variables | Groups | N | Empathy score | | t-value | P-value | |
|---|---|---|---|---|---|---|---|
| | | | Mean | S.D | | | |
| Age | 12-15 | 151 | 32.64 | 4.73 | 10.010 | 1.971 | Not significant |
| | 16-18 | 63 | 32.63 | 4.99 | | | |
| Gender | Male | 117 | 151 | 4.73 | 0.010 | 1.971 | Not significant |
| | Female | 97 | 63 | 4.99 | | | |
| Mother tongue | Hindi | 7 | 31.86 | 4.41 | 0.438 | 1.971 | Not significant |
| | Malayalam | 207 | 32.67 | 4.82 | | | |
| Good friendship | Yes | 209 | 32.52 | 4.77 | 2.364 | 1.971 | Significant |
| | No | 5 | 37.60 | 3.13 | | | |

**Table 3: ANOVA Test for Comparing Interpersonal relationship Score Based On educational qualification, situation before being in the institution, interest in education and time period for being in the institution**

| Variables | Groups | N | Interpersonal relationship score | | F-vale | P-value | |
|---|---|---|---|---|---|---|---|
| | | | Mean | Std. Deviation | | | |
| Educational qualification | Primary | 33 | 32.48 | 5.37 | 1.668 | 3.039 | Not significant |
| | Secondary | 115 | 33.31 | 4.10 | | | |
| | Higher secondary | 66 | 34.11 | 3.99 | | | |
| Situation before being in the institution | Studying | 181 | 35.00 | 5.89 | .504 | 3.039 | Not significant |
| | Working | 4 | 33.38 | 4.24 | | | |
| | Wandering | 29 | 33.43 | 4.30 | | | |

***Cont...*** **Table 3: ANOVA Test for Comparing Interpersonal relationship Score Based On educational qualification, situation before being in the institution, interest in education and time period for being in the institution**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Interest in education | Interested in studies | 160 | 33.29 | 4.34 | .499 | 3.039 | Not significant |
| | Not interested | 6 | 32.83 | 4.22 | | | |
| | Get training in any type of vocation | 48 | 33.96 | 4.20 | | | |
| Time period for being in the institution | 1-5 years | 137 | 33.39 | 4.27 | .806 | 3.039 | Not significant |
| | 6-10 years | 38 | 32.87 | 4.55 | | | |
| | Above 10 years | 39 | 34.10 | 4.16 | | | |

**Table-4: Significance Test (T-test) For Comparing Interpersonal relationship with gender, mother tongue and about good friendship**

| **Variables** | **Groups** | **N** | **Interpersonal relationship score** | | **t-value** | **P-value** | |
|---|---|---|---|---|---|---|---|
| | | | **Mean** | **S.D** | | | |
| Age | 12-15 | 151 | 33.15 | 4.08 | 1.467 | 1.971 | Not significant |
| | 16-18 | 63 | 34.10 | 4.74 | | | |
| Gender | Male | 117 | 33.67 | 4.36 | 0.885 | 1.971 | Not significant |
| | Female | 97 | 33.14 | 4.23 | | | |
| Mother tongue | Hindi | 7 | 33.00 | 5.89 | 0.983 | 1.971 | Not significant |
| | Malayalam | 207 | 33.38 | 4.24 | | | |
| Good friendship | Yes | 209 | 33.35 | 4.24 | 1.676 | 1.971 | Significant |
| | No | 5 | 36.60 | 6.02 | | | |

**Table-5: Correlation between empathy and interpersonal relationship**

**Chi-Square Test**

| | | Interpersonal Relationship | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Low (<= 30) | | Moderate (31 - 36) | | High (>=37) | | No. | % |
| | No. | % | No. | % | No. | % | | |
| Empathy | Low (<= 29) | 17 | 31.5 | 30 | 55.6 | 7 | 13.0 | 54 | 100.0 |
| | Moderate (30 - 35) | 25 | 24.8 | 59 | 58.4 | 17 | 16.8 | 101 | 100.0 |
| | High (>=36) | 10 | 16.9 | 30 | 50.8 | 19 | 32.2 | 59 | 100.0 |
| total | | 52 | 24.3 | 119 | 55.6 | 43 | 20.1 | 214 | 100.0 |

## Discussion

Mathies Allemand et al in their study states that during adolescent years there is a tendency of increase in empathy ,the present study shows that there is no significant difference between empathy and age even though among 1-18 years old children who are 29% among total respondents and other children who are below that also having same level of empathy[3].

The present study shows that female children are empathetic than male children, which comes only 45% among total respondent ,Loren Toussaint and Jon R.Weeb In their study among 127 respondents states that females are more empathetic than males[4].

Suk Chun Fung in his study states that education is a significant factor of humans empathy same as this in the present study also the respondents having empathy are secondary school children (53%) comparing with primary school children[5].

The present study shows that the empathy is comparatively less among the children who were wandering(13%) before being in the institution than those who were working(2%) and studying (84%) ,this result shows that the children who are not getting proper parental care ,love and attention without fulfilling their basic needs are lacking empathy as emphasised in the study of Paulina Akpan-Idiok and Aniebietabasi in their study which states that family type , good parenting and home atmosphere influences child's social adjustment[6] .

Ravneet Kaur et al in their study states that the children who were being in the institutionalised for 1-5 years have more empathy but in the present study the children who are having empathy are those who are institutionalised for above 10 years, the respondents who are being in the institution more than 10 years are only 18% among total respondents[7].

Aarti Thakkar et al in their study states that compared to the attachment of institutionalised children between their inmates, care givers and mentors, it shows that the

children are more attached and have understanding with their inmates as like in the present study the children those who don't have good friendship in the institution have empathy than those who have good friendship in the institution, that's only 2% among total respondents[8] .

According to the present study all the children are having moderate level of Interpersonal relationship, which can be supported by the study of Kim Maclean et al which states that even though less optimal development which includes intellectual, physical, behavioural and social development, which is one of the risk factor of institutionalisation, it may not lead a child to psychopathology during their process of development[9].

The present study shows that both male(55%) and female(45%) children have, interpersonal relationship ,Rebecca A .Colman and Cathy Spatz Widom in their study states that that during adulthood both males and females are incapable to form a healthy interpersonal relationship as they were exposed to physical abuse or neglect during their childhood[10.]

The present study shows the result , higher secondary school students (30% of the respondent)have interpersonal relationship than secondary and primary school students ,which can be supported by the study result of R.Steve Mc Callum and Bruce A,Bracken which states that there is a increased risk of dropping out of school ,criminality and even marital maladjustment among children who are having poor interpersonal relationship which means once the interpersonal relationship is developed the rate of adjustment problems also decrease thus they continue the education[11].

The present study says that the children who were wandering and working before coming to the institution have interpersonal relationship than the children (84%) who were studying before being institutionalised have interpersonal relationship but in the study of S.N .Madu et al which states that as the street children have lower purpose in life the quality of interpersonal relationship is also low than non-street and part –time non street children[12].

David Zandvliet et al in their studies concluded that the self-interest of the students in learning is promoted by among students once they feel they are connected with their teachers which makes them to believe that they are competed and experience and thus they experience a substantial support of autonomy from their teachers, in the present study also as mentioned in the above study majority the children who are interested in studies or to get training in any type of vocation have interpersonal relationship than those who are not interested in studies[13].

Robert Winston and Rebecca Chicot in their study reported that if children have insecurity feeling about their attachment to their primary caregivers which effects the child to form and maintain healthy relationship throughout life ,in the present study it states that for children who are being in the intuition for 1-5(64% of respondents) years and 6-10(18%) years have low level of interpersonal relationship as it is said in the above study as they are comparatively younger than others[14]. The present study states that even if the children don't have good friendship in the institution the interpersonal relationship is high among them (2% of the respondents), but on the other hand in the study of Kwame S.Sakyiand et al in their study they concluded that the psychological difficulties in later stage of development is associated with childhood friendship such as those who are having at least one good friend may reduce the psychological difficulties in young adulthood[15].

The present study shows that there is a positive correlation between empathy and interpersonal relationship, also the study of Ruiying Li,Tao Jiang et al states that selfless concern about others is the outcome of good interpersonal relationship[16].

## Conclusion

The research states that many of the socio demographic variables have influence on both empathy and interpersonal relationship among institutionalised children even though it's very slight. The study also reveals that there is relationship between empathy and interpersonal relationship.

**Ethical Clearence**: Ethical clearence was obtained before commencing the study.

**Source of Funding**:Self

**Conflict of Interest**:Nil

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Print-ISSN:0971-720X, Electronic - ISSN:0974-1283, Frequency: Quarterly (4 issues in a year)

**Medico Legal Update** is a journal which brings latest knowledge regarding changing medico legal scenario to its readers. The journal caters to specialties of Forensic Medicine, Forensic Science, D. N. A. fingerprinting, Toxicology, Environmental hazards, Sexual Medicine etc. The journal has been assigned international standard serial number (ISSN) 0971-720X. The journal is registered with Registrar of Newspapers for India vide registration numbers 63757/96 under Press and Registration of Books act, 1867. The journal is also covered by EMBASE (Excerpta Medica Database) from 1997 and by INDEX COPERNICUS, POLAND.

**Medico-Legal Update** is a quarterly peer reviewed journal. The journal has also been assigned E- ISSN 0974-1283 (Electronic version). The first issue of the journal was published in 1996.

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|---|---|
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**Published, Printed and Owned: Dr. R.K. Sharma**
**Printed at: Printpack Electrostat G-2, Eros Apartment, 56, Nehru Place, New Delhi-110019**
**Published at: Institute of Medico-Legal Publications: Logix Office Tower, Unit No. 1704, Logix City Centre Mall, Sector- 32, Noida - 201 301 (Uttar Pradesh), Ph. +91 120 429 4015, +91 9971888542**