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Case Study

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Autopsy Based Findings in Fatal Blast Cases: A Case Series

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Abstract

Blast incidents resulting trauma and deaths are serious health issues. Blast incidents could be either accidental in a military or industrial setup or homicidal as an act of terror. Suicidal blast incidents are uncommon. This article briefly reviews the various types of injuries examined medicolegally by the authors in deceased in blasts cases, to know the various causes of death noted in different autopsies and the factors on which the fatal injuries sustained depends.The different varieties of burns like flame burns, scalds, charring and other associated injuries due to blast like lacerations of skin and muscles due to direct trauma, lacerations of viscera and rupture of hollow viscera due to blast waves etc. may be seen in person as per nature of blast. In present case series, authors observed the injuries over the bodies and other findings were consistent with the alleged history of incidences. However, other factors like scene of crime, type, pattern and distribution of injuries over the body, conditions of the clothings, if available etc are helpful in deciding the cause and manner of death. Determination of the manner of death in blast cases is chiefly the task of investigating agencies and the role of forensic pathologist is contributory. However, a forensic pathologist may play a crucial role in deciding the manner of infliction of injuries or death and helps the investing agency and Hon'ble Courts in deciding the case and delivery of justice to victims of blast cases by visiting the scene of incidence, pursing the types, patterns and distribution of injuries over the victim of blast and considering the inquest report.

Keywords: Blast, Burns, Injuries, Haemorrhagic Shock, Neurogenic Shock, Crime scene.

Introduction

The cause of death as described in literature is the disease or injury responsible for starting the sequence of events, which are brief or prolonged and which produce death[1]. Determining the final cause of death begins at the end of physician who declares the death

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and document the chain of events that leads to death including the history, clinical findings of patient, resuscitative measures and response of patient towards them along with a provisional cause of death. However, in medicolegal cases, the final cause of death is ascertained by the forensic pathologist who correlates the autopsy findings over the body and the circumstantial evidences reported by the forensic scientist from the scene where incident happened. There are various objectives of a medicolegal autopsy including identification of the individual in cases of unknown dead bodies, determining the cause and manner of death, documenting malformations, obtaining and retaining various biological samples for further examination/analysisetc[2]. The need for conduction of a medicolegal autopsy occurs in unnatural deaths i.e. accidental, homicidal and suicidal. The manner indicates the circumstances under which the person died. It is established from the personal and family history, circumstantial information from the scene of death, witnesses of the event, information from family members and others and by the autopsy findings[1]. Different modes of injuries results into different types of injuries in a single incident. The simulation of injuries sustained due to various mode of injury is another question to be solved by the forensic pathologist during autopsy. The contributory role of forensic investigation team has also been discussed. A blast means destructive wave of highly compressed air spreading outwards from anexplosion[3].

Here in the presented case series, we are discussing various types of injuries examined medicolegally by the authors in deceased in blasts cases, to know the various causes of death noted in different autopsies and the factors on which the fatal injuries sustained depends. However, determination of the manner of death in blast cases is chiefly the task of investigating agencies and the role of forensic pathologist is contributory.

Case Discussion

Case No. 1: A young married female while working in the kitchen at her home encountered a fatal incident of blasting of cooking gas cylinder and was brought to our medical facility. The treatment like proper dressing with silver sulfadiazine ointment to prevent infection, various fluids to prevent dehydration and maintain electrolyte balance etc. was given to save the life of victim. However, the patient died in the hospital during treatment due to severity of burns as total body surface area involved by burns was about 95 percent. As the burns were severe, prognosis was very poor and patient succumbed to death. On requisition by the investigating agencies, the autopsy was conducted. At the time of postmortem examination, white surgical bandages were wrapped all around over the brunt area except face with silver sulfadiazine ointment however sulfadiazine ointment is present over the face. On postmortem examination, singing of scalp hairs, eyebrows, eyelashes, axillary hairs were noted. On further examination, superficial to deep burns were present over head and face, neck, front and back of chest and abdomen, front and back of both upper and lower limbs. Only small area of lower limbs at places and perineal region which was covered tightly by undergarments, were escaped from burn injury. Unhealthy granulation tissue was present at places over the brunt surface area. All the viscera were found congested. The cause of death in this case was opined as described burn injuries and its complications i.e. sepsis (Fig. 1)

Figure-1 Showing Burns injuries over the Figure-2 Showing charing of body victim of cylinder blast while cooking during blast in paint factory

Case No. 2

In a paint factory, a blast into the boilers happened and resulted into the instantaneous death of a 2-year-old female child playing there nearby while her parents were working in the factory. The child was brought to the hospital where she was declared dead. As the insurance claims were involved in this case, an autopsy was conducted on the request of Police in our institute. The body was received naked and

was wrapped in sheet of cloth. On postmortem examination, scalp hairs, eyebrows and eyelashes were found completely burnt off. On further examination, charring was observed over head and face, neck, front and back of chest and abdomen, front and back of both upper and lower limbs and perineal region. The child was in pugilistic attitude as a result of heat-related contractures. Epidermis was burnt off at places, hence missing at places. Reddish discoloration of skin was noted on brunt area where epidermis was missing. Soot particles were found in the oral cavity and respiratory tract at places. All the viscera were found congested. Neurogenic shock due to the burn injuries present over the body was the cause of death in this case. (Fig. 2). The working conditions of the factory for the workers were usually not up to the mark and as per guidelines issued time to time by the concerned competent authority. In the present case, mishappening at least to the child is preventable as parents are not supposed to bring the children at factory during the working.

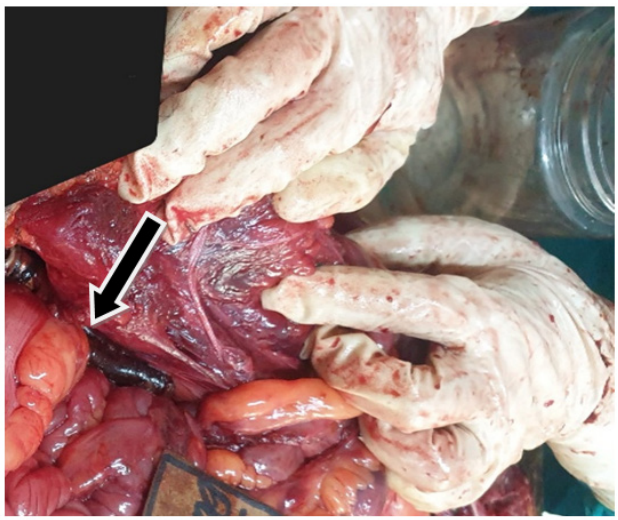

Figure 3: Showing piece of metallic pipein abdominal cavity in victim of blast of automobile tool industry

Case No. 3

A factory worker of automobile tools industry succumbed to the injuries sustained due to blast in the boiler. The body was received in our department for medicolegal autopsy. On examination, superficial burns were noticed over the dorsal aspect of the right foot and adjoining lower leg constituting about five percent of total burn surface area which was not sufficient to cause death in the ordinary course of nature. Singing of body hairs were not noticed on the body of deceased. Cloths were also not brunt. However, a lacerated wound was found over the anterior abdominal wall. On dissection and exploration of abdominal cavity, peritoneum was found breached and a piece of metallic pipe was found in the peritoneal cavity [Figure-3]. The peritoneal cavity contained about 3 litres of fluid blood. The organs were found pale. The cause of death in this case was opined as haemorrhagic shock due to the described injury. In many of the industries, working conditions are not favourable and not in accordance to the established rules and regulations. Many of the instances of misshaping to the workers working in various industries may be prevented by taking proper safety measures i.e. by wearing protective gears by workers, time to time checking of the machinery/ equipments, enough space for workers and proper measures to combat any mishappning due to fire incidence etc. In the present case no protective gear were used by the deceased to protect himself from any mishappening and immediate proper measures were not available in the factory to save the life of workers and other related persons working in the industry [Figure No. 4 and 5 were of scene of incident of present case].

Figure 4 **Figure. 5**

Showing scene of incidence of blast in automobile tool factory

Case Discussion

The injuries sustained over the body in an incident of blast and their fatality depends over various factors described here:

The source of blast: The injuries sustained over the body depend on the distance of the person from the epicentre of blast; the effect of disruptive wave produced at the point of blast varies with the distance. Shrapnel have less range than the shock wave produced. However, the part of the body effected decides the fatality of the injury present.

Type of injury: Burns are the most common injuries sustained over the body in an incident of blast as observed/noticed in the above discussed autopsy reports. All the three deceased had burn injuries ranging from superficial burns to charring of the body.

Discussion

Bombings and blasts have the potential to inflict multiple and devastating injuries to a large number of victims simultaneously and without warning. On account of the variety of circumstances involved in such events (e.g., indoor vs. outdoor, size of the explosive charge, distance of victims from the explosion, presence of secondary debris and of biological or radiological contaminants, structural collapse), each bombing event is unique[4].

Explosions are physical, chemical or nuclear reactions that involve the rapid release of considerable amounts of energy. Their deleterious effects on living organisms are embodied by the term blast injury. The incidence of injuries resulting from explosions has increased throughout the twentieth century. This has been caused in part by industrial expansion[5].

An explosive material is a reactive substance that contains a great amount of potential energy that can produce an explosion if released suddenly, usually accompanied by the production of light, heat, sound, and pressure. It is of two types: (1) High order explosive: which after detonation produces instantaneous high pressure rapidly expanding gases which compress the surrounding air resulting into supersonic over pressurization shock or blast wave followed by negative pressure (suction) wave which lasts for about 5 times. (2) Low order explosive: which undergo deflagration instead of detonation thereby releasing slow energy as compared to high order explosives resulting in subsonic explosion lacking over pressurization blast wave; examples are pipe bombs, gunpowder and most pure petroleum-based bombs such as Molotov cocktails[6].Abdominal injuries include abdominal haemorrhage and abdominal organ perforation and laceration. Blast injury to the gastrointestinal tract (GIT) should be suspected in any victim with signs and symptoms that include abdominal pain, rebound guarding, absent bowel sounds, nausea, vomiting, hemetmesis, rectal pain, testicular pain, or with unexplained hypovolemia[7]. In an autopsy case of accidental blast of low order explosive, body of the victim showed approximately all patterns of injuries because he was very close to the centre of the blast[8]. Victims of blast injuries were examined medicolegally and different types of mechanical injuries were noticed including the thermal burns and blast lung[9]

Blast injuries include both physical and psychological trauma. Physical trauma includes fractures, respiratory compromise, injuries to soft tissue and internal organs, internal and external blood loss with shock, burns, and sensory impairment, especially of hearing and sight. Five mechanisms of blast injury have been described. 1. Primary which is due to impact of supersonic blast wave on body which preferentially affects hollow or gas-filled structures? Mild traumatic brain injury (concussion) may also be observed 2. Secondary due to impact of debris from blast onto body that primarily causes penetrating or blunt injuries. 3. Tertiary is due to impact of body thrown by blast onto environmental surfaces or debris causes fractures and traumatic amputations and closed and open brain injury. 4. Quaternary- Processes independent of primary, secondary, or tertiary blast injury (e.g. burns, toxic inhalation, crush injury from entrapment under debris, aggravation of medical disorders) it causes burns, crush injuries with rhabdomyolysis and compartment syndrome. Respiratory tract injury from inhaled toxicants, asthma, angina, or myocardial infarction may be triggered by the event 5. Quinary- These are the injuries resulting from toxic materials absorbed by the body from the blast and post detonation environment (e.g. radiological, biological substances) which causes radiation burns or acute radiation sickness[10].

By visiting the scene of incidence, pursing the types, patterns and distribution of injuries over the victim of blast and considering the inquest report, a forensic pathologist may decide the manner of infliction of injuries or death and helps the investing agency and Hon'ble Courts in deciding the case and delivery of justice to victims of blast cases.

Conclusion

The cause and manner of death in every medicolegal case is must to know. However, in

cases of blast, it is a challenging task to determine manner of death because of the effect of blast on body by different patho-mechanics. However, a forensic pathologist from meticulous autopsy, crime scene investigation, personal and family history, circumstantial information from the scene of death, witnesses of the event, information from family members and others may decide the manner of infliction of injuries or death and helps the investing agency and Hon'ble Courts in deciding the case and delivery of justice to victims of blast cases and met the objectives of a medicolegal autopsy. Further, incidence of mishappning and injury/fatality to the concerned persons of factory may be decreased by wearing protective gears by workers, time to time checking of the machinery/equipments and availability of proper measures to combat any mishappning due to fire incidence etc.

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Case Study

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A Typical Non-ballistic Penetrating Missile Injury in an Industrial Setup: Rare Case Reports

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Abstract

Non-ballistic fatal penetrating missile injuries are rare occurrences in an industrial setup. We present two cases wherein industrial workers sustained fatal penetrating injuries while working in a steel sheet pressing factory. In the first case, a metallic piece detached from a steel sheet penetrated the chest cavity. Similarly, in the second case, a detached steel piece penetrated the left side back of the abdomen. Both the cases were brought to PGIMER, Chandigarh, a tertiary care institute for specialized care, but succumbed to their injuries. Since the injuries on the chest and abdomen were penetrating wounds which raised suspicion of foul play among relatives, both the cases were subjected to forensic autopsy. It was concluded that in both cases, the cause of death was haemorrhagic shock due to accidental penetrating injury by a detached metal piece at the workplace. Authors observed that such bizarre injuries would be easily preventable if torso armour had been made mandatory by the authorities for the workers in such factories.

Keywords: Penetrating wound, industrial injury, non-ballistic missiles, steel piece, autopsy.

Introduction

It is a well-known fact that non-adherence to safety protocols could easily result in fatal accidents in an industrial setup. According to a WHO report on global health risk published during the year 2022, more than 360,000 fatalities happen worldwide due to unintentional occupational injuries every year. Among these, more than 90% of fatalities occur in the male population, and a considerable number of them are in the age group of 15 to 59 years.[1] In India, as most of these young men are the breadwinners of their families, these occupational injuries impose a severe socioeconomic burden on the country.[2] Here we present two cases of a similar kind wherein a broken piece from a metallic sheet acted as a flying missile during cutting and processing by high-

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powered moulding machines and resulted in fatal penetrating wounds to the workers.

Case 1

A 32-year-old male was referred from a local hospital to PGIMER, Chandigarh, with an alleged history of accidental injury to the chest while working on a moulding machine in a factory situated at Yamuna Nagar district in the Indian state of Haryana. The patient was declared dead on arrival. This case, as an unnatural death, was subjected to a forensic autopsy.

Autopsy Findings

A horizontally placed stitched wound of 6 cm was found on the front of the upper chest in the midline [FIGURE 1A]. On exploration, wound margins were clean cut with both angles being acute. The penetrating injury extended into the chest cavity through the sternum, at the level of the third intercostal space. The wound track was further extending into the left lung, making an entry defect of 2.5 cm x 1.3 cm on the costal surface of the upper lobe[FIGURE 1B]. A metallic piece of 5 g was found embedded in the lung tissue measuring 6.5 cm x 1.8 cm with sharp margins [FIGURE 1C]. About 1.3 litres of fluid and clotted blood were found in the left pleural cavity. All the internal organs were found pale. The cause of death was declared as hemorrhagic shock.

Figure 1A: shows a penetrating wound on the chest wall, Figure 1B: shows a penetrating wound in the upper lobe of the left lung, Figure1C: shows the metal sheet piece of 6.5 cm x1.8 cm.

Case 2

A 22-year-old male was admitted to the emergency department of PGIMER, Chandigarh with an alleged history of injury on his back by shrapnel at his workplace in a steel plant at Jagadhari in the State of Haryana, India. The patient was first taken to a local hospital where his ultrasound abdomen showed a 4.4 cm x 3.2 cm ill-defined cystic lesion near the medial pole of the left kidney suggestive of hematoma, thereafter the patient was referred to our hospital on the same day. On admission, the patient was unconscious and in respiratory distress with a Glasgow coma scale (GCS) score of 4. A penetrating injury was noted over the back near the midline at the level of T11 and T12. Ultrasound showed moderate right-sided pleural effusion and mild left-sided pleural effusion with retroperitoneal hematoma and rupture of psoas muscles on the right side. Hedied within 24 hours of admission. As it was amedico-legal case,a forensic autopsy was conducted by the Department of Forensic Medicine.

Autopsy findings

A stitched penetrating wound of 1.1 cm was found over the back of the left side of the abdomen, near the midline at the level of the eleventh thoracic vertebra.[FIGURE2 A] The wound extended into the peritoneal cavity by penetrating the diaphragm, psoas muscle, the hilar surface of the spleen, and the upper pole of the left kidney and got lodged in the caudate lobe of the liver.[FIGURE2B] A thin metallic object weighing 1 g measuring 4 cm x 0.5 cm was retrieved from the liver.[FIGURE 2C] The peritoneal cavity was full of fluid and clotted blood of about 1.5 litres. The cause of death was declared as haemorrhagic shock.

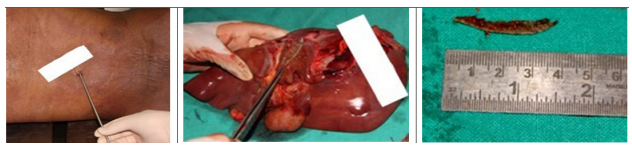

Figure 2A: Probe showing penetrating wound over the back, Figure 2B: Pointer showing the metallic piece in caudate lobe of the liver, Figure 2C: showingthe metal piece of 4cm x 0.5 cm.

Discussion

Penetrating injuries due to flying objects or missiles are widely reported in the literature mainly seen in gunshot or bomb blast cases.[3] Non-ballistic missile injuries are very rare and when they happen in an industrial setup without any eyewitness, raise suspicion about the homicidal nature of such injuries.

In the first case, the deceased was working in a steel factory where he was cutting steel sheets, a metallic piece from the steel plate got detached and hit the chest. It penetrated the lung and resulted in haemothorax. Similarly, in the second

case, when the deceased was working with a steel sheet pressing machine, a detached piece acted as a missile that penetrated the liver and resulted in a haemoperitoneum. Both cases were from the same industrial zone, which suggests the common occurrence of such injuries in that area.

Such kind of penetrating injuries are characterized as non-ballistic missile injuries in which the injuries are caused by an object with an impact velocity of less than 100m/s.[4] Various studies suggested that for a missile to perforate the skin, subcutaneous tissue and underlying muscle, a minimum velocity of 70 m/s is needed.[5,6,7] The tissue damage depends upon the kinetic energy of the missile and the density of body tissue penetrated. The specific gravity of tissue determines the amount of damage caused by penetrating missiles.[8,9] Dense organs absorb more energy resulting in more damage. Lungs have much lower density as compared to the liver.[9]

Only a few such types of penetrating occupational trauma caused by non-ballistic missiles are reported in the literature. Corzani et al. reported a case where a 22-year male encountered occupational injuries while making firewood with an axe, a detached metal piece from the axe penetrated the neck, pleural cavity, and upper lobe of the left lung and lodged in the posterior thoracic wall resulted in hemopneumothorax.[10]Satyarthee et al. reported a case of a 28-year male construction worker, who sustained a penetrating injury from a triangular piece of knife-sharpening ceramic stone which got detached from the machine penetrated his right orbital roof and got lodged in the right parietal lobe of the brain.[11] Such kind of cases are measurably reported from developing and underdeveloped nations due to poor implementation of safety guidelines at workplaces. In developed nations, such types of occupational hazards are minimized by industrial automation and strict implementation of safety guidelines. To prevent such factory-related injuries, the state government should arrange regular training programs regarding safety measures for handling machine parts. Government officials should visit factories regularly and ensure that there is no violation of prescribed standards.

Conclusion

These cases confirm the fact that improper industrial setups and flouting of safety rules may result in fatal penetrating injuries. Despite the rules regarding safety and quality norms in factories, the availability of high-quality industrial machines is rare. The government should take strict regulatory action towards the factories flouting safety norms and not adhering to a regular check-up of machines. The fatalities in the present cases could have been easily avoided, had the workers been provided protective torso jackets. Regular updating, as well as training among workers, could pave the way for a better and more protective Industrial working environment.

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Descriptive Study

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Summary and Reflection on the Introductory Implementation of Attitude, Ethics and Communication Skills (AETCOM) Module

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Abstract

AETCOM (Attitude, Ethics and Communication Skills) Module implementation was a new event in the curriculum. As per the Curriculum based medical education more importance was given to the attitude component which was a new development. The first batch of students in this curriculum started in 2019. The batch also had delay in their course due to the Covid pandemic. Despite many challenges it was possible to implement the module. Here we are detailing the process of implementation of the module in our institution and describing our experience with the first batch of students. This aims to provide a data base to build upon and further improve the future sessions in AETCOM.

Keywords: Attitude, Ethics and Communication Skills, Implementation, Competency Based Medical Education

Introduction

Medical education in India is evolving at a rapid pace currently. At present, there are 555 medical colleges in the country, out of which 285 in Government and 285 are in private sector with annual admission capacity of 83050 MBBS (Bachelor of Medicine, Bachelor of Surgery) students every year.[1] To improve the outcome of this huge percentage of doctors reaching the community, the Medical Council of India (MCI) envisaged the "Vision 2015" document to evolve a roadmap for graduate and postgraduate medical education comparable to global standards, with emphasis on early clinical exposure, integration of basic and clinical sciences, clinical competence, and skills. The goal is to create an "Indian Medical Graduate" (IMG), who is a skilled and motivated basic doctor, physician of first contact (primary care physician) for the community for both urban, as well as rural India, while being globally relevant.[2]

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Integration of ethics, attitude, and professionalism in all phases of learning has been suggested as one of the key curricular strategies in the document to enable the IMG to function professionally. With the ever-increasing work load with added stress at work place and with several incidences of assault on doctors, it has become very important at this point of time to include communication skills and professional ethics in regular medical teaching curriculum. Several researchers have opined that communication skills among medical professionals and interns was poor and teaching communication skills had profound positive effect on their practice and improved doctor-patient relationship.[3,4,5] Good communication skills and appropriate attitude and good professional conduct are very essential not only to practice medicine but also to motivate the community and the health team.[6]

Finally, in 2020 MCI (Medical Council of India) made it mandatory to teach Attitude, Ethics and Communication skills (AETCOM) in all medical colleges across India. MCI also suggested that Nodal & Regional Centres to train the facilitators and Medical Education Units in each medical college to take the responsibility of implementing AETCOM. To guide the facilitators, MCI has provided AETCOM handbook which has systematically designed modules for each professional year with respective competencies and resources.[7]

In this paper, we are describing our experience in implementing AETCOM for the first CBME (Competency Based Medical Education) batch of undergraduate students. We have also put an effort to bring out the challenges we faced and the possible solution for those challenges.

Implementing AETCOM:

There are 5 modules for first year Undergraduate students. These five modules were spread across first academic year. At our institution , we have 250 students per academic year. Hence 6 small groups were formed with 40 - 42 students in each group for small discussions. All modules were taken as per the norms given in AETCOM handbook and also the time allotted was as per the handbook. All modules had closure sessions as per handbook.

First Module – What does it mean to be a Doctor?

The first module had a panel discussion based on title, white coat ceremony, small group discussion and hospital visit. The faculties identified for each of the activity, were personally contacted and briefed about the objectives and plan of the program. For the small group discussion 12 faculties were identified. They were briefed as to how to conduct the discussion and resource material was shared with them. Learning objectives, competencies and assessment format were specified.

A facilitated panel discussion was conducted with one of the AETCOM committee members as the moderator. The panellists consisted of faculty with varying capacities from preclinical & clinical departments and an intern. During panel discussion, panellists shared their views on responsibilities of a good doctor in hospital as well as in community. Panellists also stressed the double-edged nature of social media and explained how to maintain balance between profession and media. The importance of communication skills and team building was shared in alignment with the IMG goals.[7] The panellists also answered questions raised by students. This was followed by 'white coat ceremony' as recommended in the module.[7] During this session the senior doctors discussed about the sanctity and the privilege of the white coat.

The following day, small group discussions were held which was mainly explorative in nature. The students discussed on why they chose this profession and their expectations. After this the students in small groups were taken to the different areas of the hospital involved in patient care. During the closure session, students shared their reflections on panel discussion, white coat ceremony and hospital visit.

Second Module: What it means to be a patient?

The first session in this module was small group discussion for which same group division and faculty allotment was followed as per module 1. During this session, students had to reflect on their past illness. Few of the questions that guided students to reflect were - How this illness affects them? What do they believe patients go through during the course of illness? How does the illness affect one's behaviour, outlook and expectations? And importance of careful

listening and time given by doctors to the patient in OPDs. Faculty also took time to sensitise them to empathy and non-judgemental attitude.

This was followed by interaction with patient. Focus was given on what the patient's concerns were, how it feels to be admitted and their expectation from a doctor. Following this, a case study was shared with them as an assignment. The assignment was regarding a doctor reflecting his experience during illness and hospital admission.[8] The students were instructed to answer few questions and discuss on the case study. The self-directed learning activity was based on patient interaction. Students had developed role plays on good and bad behaviour of doctor. They performed it in groups while others observed and noted the points. Formative assessment was conducted based on the completion of assignment, analysing and interpretation of SDL, comprehending empathy and non-judgemental attitude. Thus, the session closure was done.

Third Module- Doctor Patient Relationship

Module three started with an anchoring lecture as part of large group discussion by one of the AETCOM committee resource persons. Cases for small group discussion as given in the module were given to the students at the end of the discussion, based on which students completed their self-directed learning. The faculty for small group discussion were given hand outs on duties of doctor as part of MCI code of ethics IMC (Indian Medical Council) Professional Conduct, Etiquette, and Ethics Regulation 2002[9], Consumer Protection Act[10], KPME (Karnataka Private Medical Establishment) rules[11] , salient points from the Clinical Establishment Act[12], and also Charter For Patients' Rights For Adoption by NHRC (National Human Rights Commission) [12], various articles and case reports on rights of patient and also regarding boundaries, trust and vulnerability in the doctor patient relationship[14-17] for preparing for the same. Students were intrigued by patient's charter and the case study was focal point of discussion since it was regarding consent and patient autonomy in relation to end of life care. Closure and formative assessment were conducted based on self-directed learning, discussions and understanding.

Fourth Module- Foundations of communication

It was conducted online as lockdown was imposed due to COVID 19 pandemic. Using zoom platform, anchoring lecture on communication skills was given by the MEU (Medical Education Unit) Coordinator and AETCOM faculty. They were briefed about the Kalamazoo consensus in communication skills and the importance of good communication skills was imparted.[18] As part of self-directed learning four videos on communication skills and assignments were shared with students. The videos demonstrated appropriate and inappropriate behaviour of doctor while breaking bad news to patients and inappropriate communication based on patient's ethnicity. And thus, videos played an important role in making students understand the importance of good communication.[19-22] Snippets from well-known online series were also used for better understanding.[23] Different videos were given to each small group of students and they had to discuss about the video based on Kalamazoo consensus during discussion sessions. Student's reflections on these videos gave us the opportunity to understand their thought process and helped to rectify whenever needed. Based on the assignment and interaction, formative assessment was conducted followed by closure of the session.

Module Five- Cadaver as Our First Teacher

This was conducted as part of the teaching schedule in the department of Anatomy. During this session awareness regarding sanctity of the cadaver was created among students and were told how to show respect to dead body. They were also made aware of body donation and handling of biological tissues. There were discussions on the ethical aspects of dissection. Reflections of the students were collected on online platform during lockdown. Further closure session was planned towards the end of the academic year by the department of Anatomy.

Challenges- Competency Based Medical Education is not only a new concept which has to be incorporated with in the teaching syllabus and stipulated with minimum trained faculty but COVID 19 pandemic also posed a challenge as a part of AETCOM had to be covered through online platform.

Challenge- Introduction of a new concept and availability of minimum faculty trained in advanced medical education and CBME. It was difficult to convince few faculties and Heads of various departments (who had not undergone CBME training) to cooperate for small group discussions and hospital visits.

Proposed Solution- MCI/NMC (National Medical Council) should permit to have more regional centres for Medical Education training and also allow more faculties to be trained in CBME in every medical college.

Challenge- Resources provided in the AETCOM manual were not sufficient to have a uniform teaching throughout the country and several links provided did not open. With this insufficient literature, each college will try to plan or prepare their own resources due to which there can be major differences in contents thought in various medical colleges.

Proposed Solution - Adequate resource materials with accessible links could be provided in the AETCOM manual.

Challenge- As per AETCOM module, in small group activity (case discussion/ problem-based learning) each group should consist of only 8 - 10 students. In colleges with 250 students like our institute we would require 25 batches and 50 faculties (2 for each group) which is not feasible along with routine college and hospital related activities. A lot of planning was required to arrange for free lecture halls, gather all required resources and arrange for faculty. Hence, we divided students in to 6 groups with 12 faculties. Faculty with passion and interest were chosen. They also had to be free on the respective days. Hence standby faculty were also identified for the same. There was shortage of faculty as compared to number of UG students in each batch. We also recommend MCI/NMC to increase the teacher student ratio to improve the teaching.

Challenge- Formative assessment i.e. getting all 250 students to talk and give reflections is practically difficult in the given time. Only few students could volunteer to answer in the open forum.

To over-come this challenge, students were asked to participate in role plays and write their thoughts and reflections. This was read by facilitators and students were corrected wherever necessary.

Students Feedback:

With respect to the first module, the students were overall satisfied with the discussions and the efforts put in. They liked the interactive discussions. This made them realise the good and bad effect/ influence of social media in professional life. They also understood the importance of serving in rural area. Some students however requested that the white coat ceremony could have been held on the first day of joining college itself. Some of them wished to include more light hearted discussions in panel discussion.

During discussion on second module, by their reflections in patient interaction, the students brought out the problems faced by patients. Following facilitator guided patient interaction, students were able to pen down the problems faced by patients admitted in hospitals well. They also understood how body language of doctor helps to ease mind and build rapport with the patient without feeling intimidated or being judged. Most patients are satisfied when doctors communicate to them in a simple, respectful and non-judgemental manner.

With respect to the third module, the students expressed difficulty in deciding against patient autonomy. In the case that was given in AETCOM module, there was an elderly lady who wishes to give the assets to the caretaker and visiting doctor instead of her son who lives abroad. Initially some students did feel that it was not a bad idea to accept the proposal. After discussion and deliberations, we were able to convey the boundaries in doctor patient relationship and how to counsel against such decisions which may affect the patients' family bonds as well.

In the session on fourth module, the students brought out the importance of good communication skills. They also realised how the poor communication can give rise to ethical and legal problems during medical practice. They understood that non-verbal communication is as important as verbal communication. Students participated actively in discussion though the module was implemented on online platform.

In the session on the fifth module, the students were emotional about the selflessness of the body donors who voluntarily gave themselves for academic purpose. The session was an eye opener for bringing out the ethical aspects of anatomic dissection.

One of the feedbacks given by the first-year faculties in general, prior to the COVID 19 pandemic was that the student's attitude is different from the previous batches. They were not worried about passing tests; rather they chose to believe in some long-term goal. This is good but from a teaching learning point of view is this going to hamper their immediate content learning? Did the new curriculum change their attitude towards basic much needed knowledge acquisition?

Once the pandemic started there were challenges faced in implementing the remaining modules. However, with the help of technology and administrative support we were able to complete the modules with modification in teaching learning methods. Students were divided in to small groups and they interacted with each other online to complete the reflections and closure sessions. The assignments, material for SDL(Self Directed Learning) and reflections were shared online. This was a new experience for us but we realized that when one door closes, another door opens. We do not know when the classes may resume in the actual classrooms, but are confident that through virtual classrooms also we can conduct interactive sessions.

This was only a beginning and we tried to give it the best with the available resources. The intention was good and the efforts have been sincere. We are yet to see the result ripening to fruition once this batch passes out and actually works in the society. A feedback study at that time would reveal much-needed information regarding the effectiveness of the new curriculum.

Discussion

Teaching communication skills to medical undergraduate students, either with the help of simulated patients or in skills lab is not a new concept. Even before the implementation of foundation course and AETCOM in regular undergraduate curriculum, various authors have reported that teaching communication skills during formative years is crucial for medical students and practitioners.[3-6]

Several other authors from various medical institutes also have reported that AETCOM modules are beneficial for students.[24-28] M. Vijayasree has reported that 84% of students were satisfied with AETCOM modules. The author has also reported that students felt AETCOM sessions will help them in gaining patients confidence and will be very useful in their future practice.[28]

Among the challenges which we faced during implementation, arranging faculties and providing resource material for AETCOM session, were also reported by Anil Kapoor in his paper. The author also opined that more resource material should be provided by MCI, now NMC to maintain uniformity in implementing AETCOM.[29]

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Legislative Review

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A General Overview on the Medico Legal Provisions of Bharathiya Nyaya Sanhita 2023

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Abstract

The Bharathiya Nyaya Sanhita 2023 brought about very extensive alteration in the criminal justice system of India because it aims at overhauling the Indian Penal Code of 1860. This review article analyzes the new code from the medico-legal perspective, focusing on the provisions that might be of interest to medical and legal professionals. Specific parts of the act regarding consent, injury, criminal responsibility, medical negligence, sexual offenses, and other important areas are discussed in order to understand legislative purpose and real-life implications. Analyzing these provisions the article exposes how strategies of the healthcare delivery are interrelated with legal obligations, patients' entitlements, professionalism, and the quest for justice in practice. Specifically, the goal of this review is to help practitioners, legal scholars, and policymakers as well as physicians be more aware and thus more cautious in the new legal environment that has emerged.

Key words: Bharathiya Nyaya Sanhita 2023, Medico Legal Provisions, Indian Penal Code.

Introduction

The Bharathiya Nyaya Sanhita 2023, is a legislative reform to update and modernize currently enforced Indian Penal Code (IPC), which came into effect in 1860, during the British colonial period[1]. The new code attempts to reflect the changing legal, social, and technological realities of modern day India. The Bharathiya Nyaya Sanhita 2023 seeks to update the legal framework of the country by revising and replacing outdated provisions so to create an efficient and effective legal framework for the country.

Among one of its numerous provisions, the sections of medico legal issues are of utmost important as it is the epitome of the relationship between practice of medicine and the obligations that emanates from this profession[2]. The new code incorporates amendments and introduction of yet more sections dealing with such critical areas as cybercrime, organized crime, violence against women and children, and medico legal issues[3]. It attempts to develop a robust and responsive legal system which can better address the needs of a modern Indian society, by using it.

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The purpose of this review article is to analyze comprehensively the crucial medico legal sections of Bharathiya Nyaya Sanhita 2023. Through an analysis of some of these legal stipulations touching on medical negligence, assault, reproductive rights etc., we will try to make the legislative intent and practical significance of the provisions quite clear. In this review our target is to enhance knowledge of these important legal concepts to these important stakeholders thoroughly.

Medico Legal Provisions of Bharathiya Nyaya Sanhita[4]

Section 2 (14)

This section of BNS says injury means anyharm whatever illegally caused to any person in body, mind, reputation or property. Old corresponding section is section 44 of Indian Penal Code [5].Section 44 of IPC and section 2(14) of BNS are different in that the word "denotes" in IPC is replaced by "means" in BNS.

Section 22

This section exempts a person from being held criminally responsible if they are of unsound mind at the time of committing an act. If that individual is unable to understand the nature of their actions or does not recognize that the act is wrong or illegal due to their mental state, they cannot be considered guilty of an offence. Old corresponding section in Indian Penal Code is section 84.Concept of both sections are the same.

This benefit is available only after it is proved that at the time of committing the act, the accused was labouring under such a defect of reason, from disease of the mind, as not to know the nature and quality of the act he was doing, or that even if he did not know it, it was either wrong or contrary to law then this section must be applied. This comment is from a case law [6] based on section 84 of Indian Penal Code. The burden of proof lies with the accused to prove that one is mentally ill while doing the act prohibited by law.

Section 25

Section 25 of the BNS, 2023, addresses situations where harm is caused with the consent of an individual, provided that the act was neither intended nor known to be likely to cause death or grievous hurt. Section 87 of Indian Penal Code is the corresponding section and there is no change in the concept in the newly introduced section 25 of BNS.

When patients consent to medical treatments that might harm them, healthcare professionals are justified if the treatments aren't intended to cause grave harm, and with patients' informed consent.

Section 26

Act done to a person in good faith with their consent for the benefit of that person is not an offence. This section protects medical professionals who are doing any procedures on their patients. Here the doctor knows that procedure is likely to cause death but the procedure is done in good faith with consent of the patients and for their benefit. This concept is identical to the previous section 88 of the Indian Penal Code.

Section 27

When an act is done in good faith for the benefit of a person by consent of guardian or person having lawful charge of that person, if the person is below 12 years of age or the person of unsound mind, that act is not an offence. Here consent can be implied or expressed. It protects actions done in good faith for the benefit of a child or person with an unsound mind, taken by or with the consent of a guardian. Section 89 refers to the former equivalent section of the Indian Penal Code. The word "insane person" appears in section 89 of the IPC, while "person of unsound mind" appears in BNS section 27.

Section 28

Section 28 explains instances where consent is not valid. They are (a) Consent given under fear of injury (b) Consent given under a misconception of fact [7](c) Consent given by a person who does not understand the nature and consequence of the act due to unsoundness of mind (d) Consent given by a person who does not understand the nature and consequence of the act due to intoxication (e) Consent given by a person below 12 years of age. Section 90 is the old corresponding section of IPC. This section does not define consent but describes what not consent is [8].

Section 31

Any communication made in good faith and made for the benefit of a person, it will not be an offence if it causes any harm to the person whom it was made. This section protects medical professionals who honestly communicate with their patients even if it results unfortunate outcome. Section 93 is the old section in Indian Penal Code corresponding to section 31 of BNS.

Section 72

Disclosure of identity of victim of offences under following sections of BNS is punishable and the punishment is imprisonment for a term which may extend to two years and fine. Various sections of offences which come under this section are 64(punishment for rape), 65(punishment for rape in certain cases), 66(punishment for causing death or resulting in persistent vegetative state of victim), 67(sexual intercourse by husband upon his wife during separation), 68 (sexual intercourse by a person in authority), 69(sexual acts based on deceitful promises) 70 (gang rape) and 71 (repeat offenders of sections 64, 65, 66 and 70).This si included in the subsection(1). Subsection (2) explains the exceptions to restrictions on disclosing a victim's identity. Exceptions include disclosure made by the order of the investigating officer, with the victim's written authorization or by the next of kin if the victim is dead or a child or of unsound mind.

Section 228 A of Indian Penal Code corresponds to this section of BNS. In BNS 72 word "minor' is replaced by 'child'. Child is defined in section 2(3) of BNS as any person below the age of eighteen years. This is a new addition.

Sections 88 to 92

88: Penalises miscarriage of a pregnant woman intentionally but which are done in good faith to save her life is not included. This section applies to self induced miscarriage also. Section 312 of Indian Penal Code corresponds to this section of BNS. There is no difference between these two sections.

89: If a person commits the offence under section 88 without the consent of woman the punishment is more. Old corresponding section of IPC is 313. Only difference is in place of words "defined in last preceding section" previous section number is mentioned in BNS.

90: Has two subsections. First section: If intention is to cause miscarriage of a woman with a child but the act causes death of the woman, punishment is 10 years and fine. Second section: explains the punishment if act mentioned in first section is done without the consent of woman. BNS Section 90 criminalizes causing the death of a pregnant woman with the intent to induce miscarriage. It is not essential for the offender to know that the act is likely to cause death. This section corresponds to Section 314 of old IPC.

91: Any act which is done before the birth of child and with the intention of preventing that child from being born alive or causing that child to die after birth is punishable if the act is not done in good faith for the purpose of saving mother's life.

92: Provides punishment for those who causes the death of an unborn child, which could survive outside the womb, through actions that would be considered culpable homicide if they caused the death of an adult.

Section 315 and 316 of IPC corresponds to the above two sections of BNS respectively and there is no change in BNS from IPC in these two sections.

Section 106

Section 106 of the BNS says, whoever causes death of any person by doing any rash or negligent act not amounting to culpable homicide shall be punished with imprisonment of either description for a term which may extend to five years, and shall also be liable to fine; and if such act is done by a registered medical practitioner while performing medical procedure, he shall be punished with imprisonment of either description for a term which may extend to two years, and shall also be liable to fine. "Registered medical practitioner" has been defined as a medical practitioner who possesses any medical qualification recognised under the National Medical Commission Act, 2019, and whose name has been entered in the National Medical Register or a State Medical Register under that Act. Thus, under BNS, if found guilty, imprisonment could be mandatory.

Section 304 A of the old Indian Penal Code is replaced with Section 106 (1) in the BNS. Under Section 304 A, whoever causes the death of any person by doing any rash or negligent act not amounting to culpable homicide shall be punished with imprisonment of either description for a term which may extend to two years, or with fine, or with both.

Section 114 and 116

Section 114 of BNS defines hurt as whoever causes bodily pain, disease or infirmity to any person is said to cause hurt while section 116 covers grievous hurt. The following kinds of hurt only are designated as "grievous", namely:––

(a) Emasculation;

(b) Permanent privation of the sight of either eye;

(c) Permanent privation of the hearing of either ear;

(d) Privation of any member or joint;

(e) Destruction or permanent impairing of the powers of any member or joint;

(f) Permanent disfiguration of the head or face;

(g) Fracture or dislocation of a bone or tooth;

(h) Any hurt which endangers life or which causes the sufferer to be during the space of fifteen days in severe bodily pain, or unable to follow his ordinary pursuit. Section 319 is the corresponding old section in IPC for BNS 114 and 320 is the old section in IPC for BNS 116. The difference in BNS is suffering threshold period for grievous hurt is reduced from twenty days to fifteen days in subsection (h) of section 116.

Section 200

A person who is in charge of a hospital (public or private) or any other person, who does not act according to the provisions of section 397 of the Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023,[9] can attract punishment of imprisonment up to one year or fine, or both.

Section 397 of the BNSS deals with Treatment of victims: Private and Public hospitals are bound to provide first-aid or medical treatment to the victims free of cost, if the victims are covered under following sections of offences: section 64 (punishment for rape), section 65(punishment for rape in certain cases), section 66 (punishment for causing death or resulting in persistent vegetative state of victim), section 67(sexual intercourse by husband upon his wife during separation) , section 68 (sexual intercourse by a person in authority), section 70(gang rape), section 71 (repeat offenders of sections 64,65,66 and 70)or sub-section (1) of section 124 (injury caused by throwing of acid) of the BNS. Victims covered under the sections 4, 6, 8 or 10 of the Protection of Children from Sexual Offences Act, 2012 are included. Section also stipulates that Information must be given to police immediately.

Section 166 B is the corresponding section in IPC and there is no change in BNS from this section.

Section 271 and 272

Section 271 provides punishment for any negligent act that is likely to spread infection of disease dangerous to life. Punishment for spreading infection by negligent action is imprisonment up to six months or fine, or both. While section 272 provides punishment for malignant act that likely to spread infection of disease dangerous to life, where the punishment is imprisonment up to two years or fine, or both. Term malignant act here indicates a deliberate intention on the part of the accused. Section 269 and 270 of IPC corresponds to the above two sections of BNS respectively and there is no change in BNS from IPC in these two sections.

Section 273

This section deals with disobedience to quarantine rules made by the government in places where infectious disease prevails .Punishment for violation is imprisonment up to six months or fine or both. An increase in quarantine misbehaviour can result in surge of pandemic/spread of infection. Section 271 is the corresponding section in IPC where Word "vessel" is used and this word is replaced by the phrase "mode of transport in BNs section 273.

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Conclusion

Bharathiya Nyaya Sanhita 2023 marks a historic turn in the Indian legal system especially in reference with medico legal provisions which affect most directly the healthcare professionals, the patients and society at large. Specific sections of the Sanhita reviewed in this article include medical negligence, assault, reproductive rights etc, as Sanhita is aimed at clarifying and strengthening legal standards specific to medical field. We hope this will provide insight to healthcare professionals about these provisions, explaining how this new legislation goes to the heart of the practical and moral obligations incumbent on people working in healthcare. In moving forward, having these stakeholders familiarity with these updated legal frameworks is paramount in allowing these stakeholders to operate in a more accountable and morally sound healthcare environment.

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Original Research Article

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Public Awareness and Perceptions of Medicolegal Autopsies in Kerala

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Abstract

Background: Death is often met with fear, rooted in the unknown, and many cultures maintain beliefs in life after death, souls, and ghosts. These beliefs shape rituals to honor the departed. However, unnatural deaths requiring autopsies can intensify challenges, especially in superstition-heavy societies. Even in Kerala, with its 100% literacy rate, such beliefs persist. This study examines public awareness, perceptions, and attitudes toward medicolegal autopsies, exploring how education, superstition, and medical practices intersect in shaping societal responses.

Aim: To study the general public's awareness in Kerala regarding various aspects of medicolegal autopsies, including the purpose, process, legal implications, and societal perceptions of such investigations.

Materials and Methods: A cross-sectional study was conducted using face to face interviews and questionnaire that was carefully prepared and distributed randomly among the general public across different regions of Kerala. The responses from study population, were collected for analysis. The responses were thoroughly examined, and conclusions were drawn based on the data gathered, providing insights into the public's awareness and perceptions of medicolegal autopsies in the state.

Results: The study conducted in Kerala revealed that most laypeople were aware of medicolegal autopsies, with 92% demonstrating a good understanding. However, 6% partially accepted the procedure's feasibility, 1.25% opposed it due to personal or cultural beliefs, and 0.75% were unfamiliar with the concept. Among those opposing autopsies, 27% cited religious reasons, 18% feared disfigurement, and 3% considered it ethically wrong. While basic awareness exists, comprehensive knowledge about the purpose, legal implications, procedures, and significance of medicolegal autopsies is limited. Misconceptions or incomplete information about when and why autopsies are conducted were common. The findings highlight the need for educational initiatives to enhance public understanding of the vital role of medicolegal autopsies in forensic and legal contexts.

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Conclusion: The study highlights strong support for autopsies but reveals significant public knowledge gaps. Addressing misconceptions through education and collaboration can improve understanding and acceptance, promoting informed consent for medical and legal purposes.

Keywords: awareness, autopsy, public opinion, healthcare system, attitude

Introduction

Medico-legal autopsies are vital in forensic science, helping determine the cause of death in suspicious, unnatural, or unexplained cases. Conducted by forensic experts, these autopsies provide crucial evidence for legal investigations and support both public health and medical advancements. They are essential for establishing the cause and manner of death (e.g., accidental, natural, suicidal, or homicidal) and can uncover hidden medical conditions, diseases, or criminal activities, such as poisoning or trauma[13]. An autopsy is also crucial for exonerating wrongly accused individuals in cases of sudden or suspicious natural deaths[14]. According to the World Health Organization (WHO), medico-legal autopsies are critical for understanding public health issues, ensuring accurate death records, and aiding in policy formulation[12].

In India, especially in Kerala, medico-legal autopsies play an important role in criminal investigations, particularly in cases of unnatural deaths. However, public awareness of autopsies remains low, with misconceptions and cultural reluctance influencing the population's views. Concerns about body disfigurement, organ theft, and limited understanding of legal processes often discourage the public from supporting autopsy procedures.

This study focuses on understanding the perceptions of the general public in Kerala, particularly those with limited education. Through a survey of 400 individuals, the research aims to uncover the public's views on the importance of autopsies, the concerns or misconceptions surrounding them, and the level of awareness about legal and procedural aspects. The results will help identify knowledge gaps and inform public awareness campaigns, improving understanding and acceptance of medico-legal autopsies. These insights will assist forensic experts, healthcare professionals, legal authorities, and policymakers in promoting the benefits of autopsies as a key element of public health, justice, and medical science.

Materials and Methods

A cross sectional study was designed to assess the knowledge and perception of public towards medical legal autopsy. General public not belonging to medical and legal fields were selected with an age more than 18 years. The questions were based on previously published studies [9,10] and modified in the context of Kerala. The questionnaire was originally prepared in English Language and was translated to Malayalam language to collect the responses.

Study was conducted on 400 people whose educational qualification were below 12th std. This group was selected as the study aims at knowing perception of lay people with little exposure and knowledge to these type of medicolegal procedures. Informed consent was taken from the participants. Sample size was selected based on statistical power, significance level and expected effect size by doing power analysis. Most of people needed assistance to interpret and understand the questions. Their answers were recorded with care and analysed. The data was entered in Microsoft™ Excel and analysis done by Statistical Package for the Social Sciences (SPSS™) version 16. Descriptive statistics was used to analyse the results.

Analysis and Results:

A large majority, 92%, of the study population expressed that they believe autopsies are essential for understanding the causes of unnatural or unexpected deaths, underlining the procedure's perceived importance for public health and justice. Another 6% partially agreed with this view, showing some level of support. However, 1.25% were opposed to autopsy procedures, often due to personal or cultural beliefs, and 0.75% of participants were either unfamiliar with the process or chose not to share their opinion. Among those who completely or partially opposed autopsies, 8 people (27%) cited religious reasons, 18 were concerned about disfigurement of the body, and 3 felt it was ethically wrong to perform.

A significant 94% of participants were unaware that, besides conventional autopsies, other types such as clinical, pathological, and psychological autopsies also exist. These terms were unfamiliar to them, though 5% mentioned having encountered them in movies or other media, without understanding their meaning. Only 1% of the study population showed complete awareness of these alternative autopsy procedures, highlighting a considerable gap in public knowledge regarding forensic and medical investigations.

Although the majority of respondents acknowledged the importance of autopsy procedures, 87.25% of the study population harbour the misconception that autopsies will significantly mutilate or disfigure the body. A smaller portion, 8%, believe that while there may be some alterations, the impact is not as extreme. Interestingly, a rare 2 % even think that autopsies could improve the body's appearance, perhaps viewing the process as a form of restoration rather than harm. 2.75 percent of individuals did not express an opinion or respond to the question.

Among the study population, 9 percent strongly believe that organs can be illegally removed during autopsy procedures, potentially for purposes like transplantation or sale. An additional 17 percent hold partial concerns about the possibility of illegal organ removal. However, the majority, at 70 percent, do not share this belief and dismiss such concerns. Meanwhile, a small segment—4 percent—expressed uncertainty, either unaware of such a possibility or refraining.

Only 12% of respondents accurately understood the term 'negative autopsy' to mean a situation in which the cause of death remains unknown even after a thorough autopsy, including pathological studies, chemical examinations, and detailed forensic lab tests. Another 8% partially agreed with this definition, suggesting some familiarity but uncertainty. In contrast, 6% completely disagreed with this interpretation, and their responses appeared largely speculative or based on misunderstandings. A significant portion mistakenly interpreted the term to mean an incorrectly performed autopsy, while others believed it referred to an autopsy report that had been rejected by the court. Overall, for 74% of the study participants, the term 'negative autopsy' was entirely unfamiliar, and their responses typically fell under 'don't know' or 'no opinion' due to a lack of awareness.

When surveyed about whether body preservation methods such as embalming could be performed on bodies that had undergone autopsy, responses varied. A total of 23% of respondents completely agreed that embalming could be done, and 20% partially agreed that it was possible. In contrast, 6% believed that embalming would not be feasible for autopsied bodies. Notably, a majority of 51% expressed uncertainty, indicating they were unfamiliar with the possibilities or limitations of embalming in such cases."

When respondents were asked about the maximum timeframe within which an autopsy should be conducted after death, a majority—58%—felt it should occur within 24 hours to ensure accurate results and avoid potential degradation of vital forensic information. Another 30% believed a longer period, up to one week, would still allow for effective post-mortem analysis. Only 8% of participants felt that there was no strict time limit, suggesting that an autopsy could provide valuable insights even after a prolonged period. Meanwhile, 4% of those surveyed were uncertain and did not offer an estimate for an appropriate timeframe

According to the survey, 47% of participants firmly believe that obtaining consent from a family member or guardian is necessary to conduct an autopsy, and an additional 4% partially agree with this view. However, only 24% of respondents were aware that family consent is not legally required in these cases. The remaining 25% of participants either had no knowledge of the requirement or held no opinion on whether family or guardian consent should be needed for autopsies.

Ten percent of respondents were completely unaware that an autopsy report can be obtained by submitting a written request from a close relative of the deceased to the relevant authority or autopsy surgeon. Only 35.2% of the study population was certain that this provision exists and understood the procedure, while another 38% partially agreed with the idea, indicating some knowledge of the process.

Additionally, 8% of participants either did not respond to the question or indicated that they were unsure about how to obtain an autopsy report. These results highlight a significant gap in public awareness about this important procedure for gaining access to postmortem examination reports.

Survey results revealed varied opinions on the role of an autopsy report in murder cases. 79 of respondents fully agreed that an autopsy report alone is insufficient as evidence to clear or convict a suspect, emphasizing that additional evidence is critical for a fair judgment. Sixteen percent partially agreed, seeing it as an important but not sole factor in decision-making. In contrast, one percent of participants viewed the autopsy report as the ultimate document for legal conviction, without need for other evidence. Lastly, four percent of respondents were unsure or lacked sufficient knowledge to form an opinion

The results are tabulated in Table 1.

Table 1: Knowledge of respondents on medico-legal autopsy Variables- Frequency and Percentage

1	**Autopsy examination of human body is a necessary procedure in unnatural / unexpected deaths**	**Responses**	**Completely agree**	**Partially agree**	**Completely disagree**	**No Opinion/ Donot know**
		Frequency	368	24	5	3
		Percentage	92	6	1.25	0.75
2	**If you disagree with the necessity of autopsy, state the reasons**	**Responses**	**Religious factors**	**Possibilities of disfiguration of body**	**It is unethical**	**No Opinion/ Donot know**
		Frequency	8	18	3	0
		Percentage	27.58	62.06	10.34	0
3	**Other than conventional autopsy there are other autopsy procedures like clinical autopsy, pathological, psychological autopsy.**	**Responses**	**Completely agree**	**Partially agree**	**Completely disagree**	**No Opinion/ Donot know**
		Frequency	4	20	376	0
		Percentage	1	5	94	0
4	**Body will be mutilated/ disfigured by the processes of autopsy**	**Responses**	**Completely agree**	**Partially agree**	**Completely disagree, cosmetically better**	**No Opinion/ Donot know**
		Frequency	349	32	8	11
		Percentage	87.25	8	2	2.75
5	**Consent of family/ guardian is necessary to perform the autopsy.**	**Responses**	**Completely agree**	**Partially agree**	**Completely disagree**	**No Opinion/ Donot know**
		Frequency	188	16	96	100
		Percentage	47	4	24	25
6	**The organs in the body can be illegally removed during autopsy procedures for transplantation.**	**Responses**	**Completely agree**	**Partially agree**	**Completely disagree**	**No Opinion/ Donot know**
		Frequency	36	68	280	16
		Percentage	9	17	70	4
7	**Body Preservation methods like embalming cannot be performed in autopsied bodies.**	**Responses**	**Completely agree**	**Partially agree**	**Completely disagree**	**No Opinion/ Donot know**
		Frequency	92	80	24	204
		Percentage	23	20	6	51

Continue.....

8	**Apart from autopsy examination, pathological study, chemical examination & forensic lab report are also necessary to conclude the cause of death in most of the cases.**	**Responses**	**Completely agree**	**Partially agree**	**Completely disagree**	**No Opinion/ Donot know**
		Frequency	168	88	32	112
		Percentage	42	22	8	28
9	**Negative autopsy is something in which cause of death is unknown even after autopsy examination, pathological study, chemical examination & forensic laboratory tests.**	**Responses**	**Completely agree**	**Partially agree**	**Completely disagree**	**No Opinion/ Donot know**
		Frequency	48	32	24	296
		Percentage	12	8	6	74
10	**The autopsy report can be obtained by written request of close relative of the deceased to the concerned authority/ police surgeon.**	**Responses**	**Completely agree**	**Partially agree**	**Completely disagree**	**No Opinion/ Donot know**
		Frequency	176	152	40	32
		Percentage	35.2	38	10	8
11	**Autopsy report is not an ultimate document/ evidence in acquitting criminal charges in murder cases.**	**Responses**	**Completely agree**	**Partially agree**	**Completely disagree**	**No Opinion/ Donot know**
		Frequency	316	64	4	16
		Percentage	79	16	1	4
12	**The maximum time within which autopsy can be performed after death.**	**Responses**	**Within 24 hours**	**Within one week**	**No time limit**	**Do not Know**
		Frequency	232	120	32	16
		Percentage	58	30	8	4

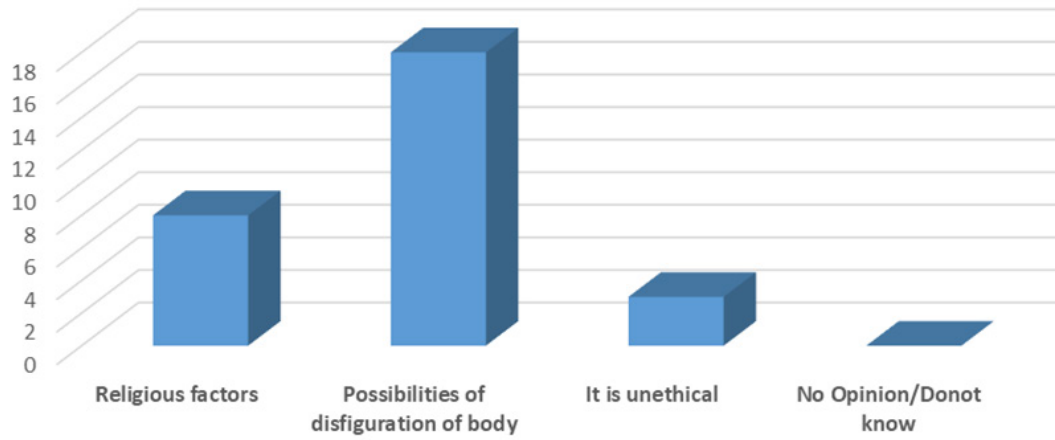

Figure 1

Discussion

In spite of its significant legal benefits and role in health care systems, autopsy rates have been fluctuating in Kerala. The reasons for this include a decreasing interest from families of the deceased, as well as from hospital administrators and accreditors. Clarity about the cause of death is important, as is

reassurance that families need not worry about negative consequences for surviving members.

We found that most people did not have adequate knowledge about autopsies and had never counselled anyone on the topic. In this study, the primary reason cited for refusing consent for autopsy was concern over the mutilation of the body. Religious beliefs and superstitions played a minor role, while fear of organ theft was another significant concern.

The proportion of participants in this study who refused consent due to concerns about body mutilation is similar to findings from a study in Zambia[6]. Parents/guardians of 891 of 1181 children (75.4%) refused to give permission, and 290 (24.6%) consented. Of those who refused, 43% did so on the grounds that it would be a "waste of time," as the diagnosis should have been made in life and the findings would now be of no benefit to them. More than one quarter of those who refused did so because a death certificate had already been issued and arrangements to transport the body had been made and could not be delayed. Traditional beliefs that ancestral spirits forbade the mutilation of dead bodies were cited by 77 (8.6%). Other reasons included the child not being their own or that they must seek permission from other family members who were not available (6%). Religious beliefs were not a major cause of refusal[6]. Studies with relatives of the deceased in Nepal[9] and Sweden[8] also found similar sentiments, suggesting that such concerns about autopsies are shared across cultures and races. Furthermore, it is often the layperson's perception of the autopsy process that contributes to reluctance. Involving the patient's close relatives in autopsy procedures improves the transparency of the same enabling a better acceptance of the same. This may bring a change in people's perception towards the concept of autopsy.

Socio-cultural and religious taboos around autopsies could be gradually reduced through educational programs and campaigns that raise public awareness about the value of autopsies. Religious objections to autopsies, often stemming from beliefs like the deceased needing to be buried within 24 hours as a mark of respect, influence relatives' decisions. Higher levels of education were associated with increased acceptance of autopsies. Education may mitigate the influence of religion on attitudes toward autopsies, as seen in the higher proportion of doctors who, despite their religious backgrounds, were willing to consent to autopsies on themselves compared to relatives of deceased patients.

Engagement and active involvement with religious community leaders may also help raise awareness about the public health value of autopsies through better counselling. This could encourage family members to permit a medico-legal autopsy when a death occurs within their community. Additionally, the experience and opinions of relatives could assist an autopsy surgeon in managing medico-legal cases more effectively.

However, significant knowledge gaps emerged in understanding autopsy types and practices. Nearly all participants (94%) were unaware that alternatives to conventional autopsies, such as clinical, pathological, and psychological autopsies, exist. Only 5% had encountered these terms in media but did not fully understand them, and just 1% showed complete awareness of these options. This suggests an overall lack of knowledge regarding forensic processes. Misconceptions about the impact of autopsies on the body are common, with 87.25% of respondents believing autopsies cause significant disfigurement. Meanwhile, 8% thought the impact was moderate, and an unusual 3% even viewed autopsies as potentially enhancing appearance, perhaps perceiving the process as restorative.

Respondents' views varied on whether bodies could be embalmed after autopsies. While 23% agreed embalming was possible, and 20% partially agreed, 6% felt it was not feasible. The majority (51%) expressed uncertainty, highlighting limited understanding of preservation options after autopsy procedures.

Regarding timing, a significant 58% believed autopsies should be performed within 24 hours of death to prevent the loss of vital forensic information, while 30% felt that a timeframe of up to a week would still yield effective results. A smaller portion (8%) saw no strict time limit, believing autopsies could still be useful after extended periods.

There was also considerable confusion about legal consent for autopsies. Almost half of the

respondents (47%) believed that family or guardian consent is legally required to perform an autopsy, with 4% partially agreeing. Only 24% were aware that family consent is not necessary, while the remaining 25% lacked awareness or opinion on the matter. Additionally, 79% were unaware that family members could obtain autopsy reports via written request, though 16% partially understood this provision, and 10% disagreed or were uncertain about the policy.

Lastly, opinions on the role of autopsy reports in criminal cases were divided. While 79% of respondents believed autopsy reports alone are insufficient for legal judgments, 16% thought they could aid but not finalize decisions. Only 1% viewed the autopsy report as conclusive evidence. Concerns about organ removal also surfaced, with 36% fearing organs could be illegally taken during autopsies, although 70% rejected this idea, and 4% were unsure or unaware of such risks. Knowledge about terms like "negative autopsy" was similarly limited; only 12% correctly defined it as a case where the cause of death remains unknown after examination. A further 8% showed partial understanding, while 6% misunderstood it completely, often confusing it with procedural errors or rejected reports. Most participants (76%) were unfamiliar with the term and either held no opinion or misinterpreted its meaning.

The findings of this study reveal that although the majority of laypeople had some awareness of medico-legal autopsies, only a few possessed detailed knowledge. Though autopsies are mandatory in most settings, relatives of the deceased often have a negative attitude toward the procedure, leading to avoidance when possible. This highlights a pressing need to increase public awareness. Healthcare institutions should take all necessary steps to create more awareness programs on medico-legal autopsies within the community. Though legally, formal consent is not required, it is still important to provide thorough explanations to family members before proceeding with an autopsy.[9]

Conclusion

The study reveals a strong, widespread support for autopsies; however, it also highlights significant gaps in the public's understanding of the procedure. Many individuals lack awareness of key aspects, such as the purpose and process of autopsies, consent requirements, maximum time limit and the legal framework governing these procedures. The major limitations of this study include the difficulty many participants faced in fully understanding the questions, often requiring additional explanations. This challenge likely stemmed from their unfamiliarity with the terminologies used. Addressing this issue in future research could involve simplifying the language or providing clearer definitions to ensure comprehension. Addressing these misconceptions and knowledge gaps is essential to improve public perceptions. By implementing comprehensive awareness campaigns and educational efforts, particularly through collaboration between clinicians, forensic experts, and law enforcement, public understanding can be enhanced. Such efforts would help dispel fear and apprehension surrounding autopsies, leading to greater acceptance. The study may be expanded significantly by incorporating specific professional groups or cultural communities, thereby allowing a more comprehensive inquiry into diverse perspectives, fostering deeper understanding, and exploring broader intellectual and practical horizons. With the right approach, these efforts could foster a societal perspective that views autopsies as routine, valuable procedures, ultimately encouraging more people to consent to them for the benefit of medical and legal insights.

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Original Article

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Survivor-Accused Dynamics in Alleged Sexual Assault Cases: A Demographic Analysis

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Abstract

Sexual assault is a type of gender-based violence. The World Health Organization (WHO) defines gender-based violence (GBV) as any harmful act that is committed against a person's will and is based on gender roles and power differences between males and females. Role of a health care provider is very crucial in the sense of Identifying, documenting and reporting such instances. This prospective observational study was carried out in the department of Forensic medicine and toxicology of a Tertiary care center in a metropolitan city of Mumbai from January 2016 to June 2017. The main aim was to observe the demographic and relational dynamics between survivors and accused individuals in alleged sexual assault cases brought for examination. All cases that fulfilled the inclusion criteria during the study period are considered for the study, which included 160 cases. In the study 93% of survivors were females and in that 73.25% were under the age of 18 years. Majority were students, graduates of Secondary School, from urban background and unmarried. An attempt to understand survivor-accused dynamics revealed the majority of accused were known to the survivors (31.25%), and a single assailant is involved (96.88%). Other contextual findings were obtained which provided more insight into the circumstances of assaults.

Key Words: Sexual assault, Gender based violence, Forensic examination, POCSO act.

Introduction

As per World Health Organization, 30% of women worldwide have experienced sexual violence by an intimate partner or non-partner and 6% of women have been sexually assaulted by someone other than a partner[1]. As per the report published in the year 2023 by the National crime record bureau of India, 31,000 rapes were reported in 2022. Although this is a large number, it has not changed since roughly 2012, when there were over 25,000 cases annually[2]. Mumbai holds the 5th position in overall crime rate (72.5) of crime against women in metropolitan cities in the year 2022, over a population of 85.2 lakhs as per NCRB[2].

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There are frequently both short-term and long-term effects on one's physical and emotional health after sexual assault. As a result, many cases are not prosecuted or are handled so late. It has been acknowledged that survivors of sexual assaults keep the incident to themselves for a variety of reasons, including confidentiality concerns, embarrassment, mistrust of the police, not wanting a family member or friend to be prosecuted, and disbelief in a successful prosecution, among others[3]. Ministry of Health & Family Welfare under Government of India, guidelines recognize the role of health sector in strengthening legal frameworks, developing comprehensive and multi-sectorial national strategies for preventing and eliminating all forms of sexual assault. Criminal law amendment Act and Protection of Children from Sexual Offences (POCSO) act 2013, are designed to uphold the dignity, rights, privacy, safety and enabling Justice to the survivors.

Materials and Methods

This prospective observational study was conducted by the department of forensic medicine and toxicology at a tertiary care facility in Mumbai, over a period of one and half years. All survivors of alleged sexual assault examined during study period of one and half year duration fulfilled inclusion criteria were included in this study, i.e. a total of 160 cases.

Inclusion criteria: a) All the survivors of alleged sexual assault brought for medico-legal examination with request for examination by Police/magistrate; b) All the survivors of alleged sexual assault brought for examination directly to hospital without registering the crime.

Exclusion Criteria: a) Survivors of alleged sexual assault who refused to give consent for medico-legal examination; b) Dead bodies with alleged history of sexual assault.

Objectives in the study were to: a) study demographic valuables of survivors of alleged sexual assault cases; b) To study relation between victim and accused of alleged sexual assault cases

A team of Doctors mainly from Forensic medicine and Obstetrics and gynecology were involved. Survivors' age, sex, socioeconomic status, demographics, incident location, reporting delay, and relationship to accused were studied.

Data source: For a subsequent group assessment, all information gathered from various sources such as casualty records, medico-legal report of Survivors, were entered into a pro-forma that was specifically created for each case.

Data analysis: The data was entered and analysed by using MS-Excel SPSS software package. Frequency of all variables was derived to check completeness of data. Magnitude was expressed in percentages.

Results

Table 1: Demographic variables

Parameters	Number of cases	Percentage
Age distribution		
0-10	38	23.75
11-20	84	52.5
21-30	24	15
31-40	11	6.88
41-50	02	1.25
>50	01	0.62
Gender		
Female	141	93
Male	11	07
Educational Qualification		
Post graduate	1	0.62
Graduate	1	0.62
Higher secondary school	48	30
Secondary school	64	40
Primary School	46	28.76
Geographical area		
Urban	154	96.25
Rural	6	3.75
Occupation		
Housewife	15	9.38
Student	123	76.87
Working woman	22	13.75
Socio-economic status		
Lower (v)	66	41.25
Lower middle(iv)	59	36.87

Continue.....

Middle(iii)	29	18.12
Upper middle(ii)	05	3.12
Upper(i)	01	0.62
Marital Status		
Married	18	11.25
Single	138	86.25
Divorce	4	2.50

Table 01 shows the demographic data of survivors.

The highest were in the 11-20 age group (52.5%), followed by those under 10 years old (23.75%).

Out of 160 cases, 107(66.87%) were female and 11(6.85%) males.

The majority of survivors had completed secondary education (40%), followed by those with primary education (28.76%).

The majority of survivors were students (78.87%), followed by working women (13.75%). A smaller number were housewives (9.38%).

The majority of survivors belonged to the lower class (41.25%), followed by the lower middle class (39.87%).

The majority of survivors were unmarried (86.25%), followed by married individuals (11.25%). A small number were divorced (2.5%).

Table 2: Survivor-Accused relationship and number of assailants.

Parameters	Number of cases	Percentage
Relationship with Accused		
Brother in law	4	2.50
Employer	5	3.13
Father	5	3.13
Friend	50	31.25
Neighbor	43	26.88
School staff	2	1.25
Stranger	24	15
Teacher	3	1.87
Uncle	13	8.12

Continue.....

Number of assailants		
One	155	96.88
Two	1	0.62
Three	2	1.25
Four	2	1.25

Table 2 reflect survivor-accused relationship which is crucial in understanding the survivor-accused dynamics. The most common type of accused was a friend (31.25%), followed by a neighbor (26.88%). Other common relationships included strangers (15%), brothers-in-law, employers, fathers, and uncles (ranging from 2.5% to 8.12%). A smaller number of cases involved school staff or teachers (1.25% to 1.87%).

The majority of cases involved a single assailant (96.88%), while a small number had multiple assailants (2 or more).

Table 3: Context and circumstances of Assault

	Number of cases	Percentage
Place of incidence		
Accused house	69	43.13
Survivors house	18	11.26
Field	9	5.62
Hotel	16	10
Office	1	0.62
Railway station	1	0.62
School	2	1.25
Secluded	43	26.88
Toilet	1	0.62
Season		
Winter	17	10.63
Summer	44	27.50
Rainy	51	31.87
Post monsoon	48	30
Winter	17	10.63
Use of Contraceptives		
Condom	22	13.75
Spermicide	1	0.62
I-pill	3	1.87
No contraception	134	83.76
Luring/Incentives		
No	124	77.50
Promise to Marriage	23	14.375
Lure/Money etc.	13	8.125

Table 3 reflects the circumstances of assaults, use of contraception and involvement of offering incentives.

The majority of survivors were assaulted in the accused's house (43.3%), followed by secluded areas (26.88%). Other locations included the survivor's house (11.26%), fields (5.62%), hotels (10%), offices (0.62%), railway stations (0.62%), schools (1.25%), and toilets (0.62%).

Of the 160 survivors, most cases occurred during the post-monsoon season (30%), followed by the rainy season (31.87%), summer season (27.50%), and winter season (10.63%).

Regarding contraception, 83.76% of cases involved no form of contraception, while 13.75% used condoms, 1.87% used I-pills, and 0.62% used spermicides.

Regarding incentives, 124 cases involved no incentives, while others received various forms such as money (6.25%), marriage pretexts (14.39%), clothes and money (0.62%), soft drinks (0.62%), or the offering to play games on a laptop (0.62%).

Table 4: Use of threatening and timeline of reporting.

Use of threatening	Number of cases	Percentage
None	117	73.125
Threatening	32	20%
Blackmailing	11	6.9%
Duration of Reporting		
0-12hrs	18	11.25
12-24hrs	25	15.62
24hours-72hrs	15	9.35
3days-7days	34	21.25
7days-1month	27	16.87
>1month	41	25.62

Table 04 includes factors like use of threatening and duration between incident and reporting. In 160 cases, the majority of accused did not threaten the survivor (73.125%), followed by threats (20%) and blackmailing (6.9%).

Regarding medical examinations, 18 survivors reported to the hospital within 12 hours of the assault (11.25%), while 41 survivors reported more than a month later (25.62%).

Discussion

From the demographic variables, most vulnerable age group identified for sexual assault is the active population of the study resulting were those persons of second decade 11-20 years (52.5%) followed by first decade 0-10 years (23.75%), Which is similar to majority of the studies conducted including Choudhry V et al[4].The reasons could be the age of adolescence, where they face significant physical and psychological changes, making them more vulnerable for exploitation and coercion. They also engage in their riskier behaviors, limited knowledge on sexuality and decision making skills.

In the present study, cases below 18 years of age group, we found female preponderance 107 cases(71.81%) as compared to male 11(100%). This is in agreement with study by, AD Aggarwal et al[5], who observed almost 95% of cases of females as compared to 5% of males of sexual assault. It is a worldwide phenomenon that the majority of survivors in sexual assault cases involving minors are female. This can be linked to a number of things, such as power dynamics that frequently disadvantage women and cultural gender norms.

The present study showed that incidences were more common among secondary school students 64 (40%), Higher secondary students 48 (30%) followed by primary students 46 (28.76%). If we combine the secondary school students 64 (40%), Higher secondary students 48 (30%) then it was observed that 70% of cases were belonging to the second decade of age group which was the most common affected age group found in our study. Our observations aligns with the results of Choudhry V et al[4].

It was observed out of 160 cases 154 survivors (96.25%) were from urban areas and 06 (03.75%) are from rural areas. Our study is similar to National Crime Records Bureau (NCRB) data, which documented that a significant number of reported sexual assault cases in India involve minors, with many of these cases occurring in urban settings[2]. The higher prevalence of sexual assault in urban areas may be attributed to several factors. The denser population in cities can lead to increased social interactions and opportunities for assault. The anonymity of urban environments can make it easier for perpetrators to act undetected.

The present study shows that out of 160 survivors were students 123 (76.87%), followed by a working woman 22(13.75%) This is consistent with Bhoi et al[6], shows that majority of victim were students comprising of 62.26% of cases. The higher prevalence of sexual assault among students may be attributed to several factors. Students' vulnerability, power imbalances with adults, societal norms and cultural attitudes, and the school environment can all contribute to increased risk. As per Choudhry V et al 4–41% of the girls and 10–55% of the boys in school and college samples have experienced one form (contact, non-contact, forced) of child sexual abuse in India[7].

In 160 survivors, 66 survivors (41.25%) were of lower class, 59 of survivors (39.87%) were of lower middle class, similar observations made by UB Chowdhury et al[6] where 77.5% of cases were from survivors belong to lower socio-economic class. This might be due to the fact that survivors and survivors are often dependent on their perpetrators for basic needs such as food, housing and shelter, therefore they are more vulnerable for sexual and physical violence. The perpetrator may takes advantage of his/her position of psychological power to coerce the victim into their needs.

Most of the cases were unmarried 138 survivors (86.25%), this again is consistent with the age group of maximum incidence which is below the legal age for marriage in India. Similar findings were noted by UB Chowdhuryetal[8] (86%).

Survivor accused relationship from the study has great value. Most common relation with survivor was friend; 50 survivors (31.25%) followed by neighbor 43 survivors(26.88%) and in 24 survivors(15%) assailant was stranger, in 3(1.87%) the assailant was teacher, in 5(3.13%) survivors the assailant was father, in 5 (3.13%) cases the assailant was employer. Out of 12 uncles 2 uncles were paternal and 1 was maternal uncle. Only 15% cases of sexual assault was committed by stranger and 85% cases assailant was known to victim.

This findings exactly coincides with another study conducted in Mumbai region by AK Jaiswani et al[9] where in 67.1% cases the assailant was friend followed by 14.47% cases the assailant was neighbor.

Studies show that most sexual assault cases involve assailants known to the victim due to proximity, trust, or familiarity, which lowers victim resistance and facilitates access.

Another interesting observation is, in 18 (11.25%) cases of survivors belong to age group under 18 years, the alleged incidence were non-violent/ forceful in nature, which falls into the legal category of statutory rape as per Indian Penal Code (IPC) 375[10]. In that 14 (8.75%) cases accused were friends followed by neighbor 4 (2.5%) cases. As per IPC 375, statutory rape is defined as sexual intercourse with a woman who is under 18 years of age, whether or not she consents[10]. Prior to criminal amendment act 2013, these cases would not have registered under offence of rape by section 375 IPC as age for voluntarily having sexual intercourse for girls in India was then 16 years. Statutory rape laws protect minors from exploitation, regardless of perceived consent. However, the complexities within these laws can lead to confusion and debate.

Majority of incidents involved only single assailant involved (96.88%) cases. This coincides with the above factor and is similar to AK Jaiswani et al (92.1%) [9]. As acquaintance rape (Friend/Boyfriend in the current study) which is committed by someone who knows the victim, they easily take control or advantage over them for sexual gratification. According to the United States Bureau of Justice Statistics (BJS) [11], date rapes are among the higher number of rape cases.

In an attempt to understand the circumstances of assaultin our study, the most reported site of offense was the accused house i.e. 69(43.13%) cases followed by survivors house (11.26%), strikingly similarto AK Jaiswani et al[9] 43.39% followed by 8.55%. Survivors with known assailants are considerably more likely than those assaulted by strangers to be assaulted in a house/apartment where he resides. Survivors assaulted by strangers are most likely to be assaulted outdoors.

It is observed that the maximum number of survivors 51(31.87%) arrived in the rainy season. Possible reason is the region of study being a coastal region, the major season is rainy which occur in almost 6 months annually.

In 134(83.76%) cases there were no any use of contraception. In 22(13.75%) cases accused used condom as barrier contraceptive, in 3(1.87%) cases I-pill was used and in 1(0.62%) case spermicide was used as contraceptive. This results are suggestive of the fact that majority of the cases reported in the present study are forced unprotected sexual violence/assault. Motivation of the assailant in using the contraceptive methods are found to be in negligible numbers which is in consistent with the study conducted at Sam Houston State University, Texas, by EN O'Neal et al [12].

No incentive was given in 124 cases, allow games on laptop in 1 (0.62) case, soft drink given in 1(0.62%) case, money given in 10(6.25%) cases, pretext to marriage was given in 23(14.39 %) cases, clothes and money given 1(0.62%) case. This might be due to the fact that in this study majority of the victim's age group ranges from 11 to 20 years, who are easily taken advantage of by the assailants after some incentives given.

No terrorizing or verbal threatening observed in majority of cases 117 (73.14%), probably due to the acquaintance of the accused with survivor. Stranger assailants are considerably more likely to use verbal threats than known assailants. This is consistent with Rahul Jain etal[13.]

In 16.89% of cases, the victim experienced physical assault, 2.5% experienced terrorization, 1.87% were subjected to verbal threats or blackmail, and 0.62% were kidnapped, verbally abused, or had videos of themselves displayed for blackmail.

With regards to the duration of reporting after the incident, in 160 survivors, the highest percentage of 25.62% reported to the hospital for medical examination more than 1 month after the assault, followed by 21.25% who reported within 3 to 7 days, 16.87% within 7 days to 1 month, 15.62% within 12-24 hours, 11.25% within 12 hours, and the lowest percentage of 9.35% reported within 24 to 72 hours, these findings are consistent with AK Jaiswani et al[9]

This is very concerning as delay in medico-legal examination of a survivor can significantly affect the efficacy of the investigation and prosecution of the case due to diminishing biological evidence, trace evidence and injuries. Survivors often avoid reporting sexual assault to the police due to shame, fear of legal repercussions, distrust of law enforcement, and substance use during the assault, as noted by C. Spencer et al[13].

Recommendations

To enhance understanding and interventions in sexual assault cases, a few key recommendations emerge from this study. Developing targeted prevention programs for adolescents, especially females aged 11–18 who represent the most affected demographic, is essential. Comprehensive sexual education in schools is important, age-appropriate sexual education programs that cover topics like consent, healthy relationships, body autonomy, and recognizing and reporting abuse should be taught. Teach about their rights and how to assert them, especially in situations of discomfort or coercion. Equip them with skills to intervene safely when they witness harmful behavior. Make school/ college environment safe by open communication channels, sensitive reporting mechanisms, and prompt investigations. Health care facilities and law enforcement system should be easily accessible to all class of society, there shall be no bias in registering, investigation and further legal proceedings. Promoting prompt reporting and supportive services can enhance both victim support and judicial outcomes. Policymakers must disseminate information about the psychological effects of sexual assault to encourage public awareness and prompt individuals to seek help. Finally considering the accented sexual assault prevalence in India, a multipronged approach is key. This includes changes in policies, laws, and social norms related to patriarchy and gender inequality.

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Conflicts of interest statement: N/A

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Original Article

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Predictive Body Height Model Based on Proximal Phalanx II Using X-Ray in Bataknese People

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Abstract

Background: Natural disasters or criminal acts that cause victims to die, in some cases the bodies of the victims can no longer be recognized because there has been severe damage such as only finding a few pieces of the body. Forensic identification of dead people or unidentified bodies, bodies in a state of damage due to rotting, burning, bomb explosions, land, sea and plane traffic accidents, tsunamis, earthquakes are very important and vital for further investigation.

Methods: This is a correlation analysis study on phalanx bone length and body height. A cross sectional study is conducted where data is collected only one time and in a specific time span. This study aims to correlate body height and proximal phalanx II bone in Bataknese people.

Conclusion: Based on the results, it is concluded that the TB, FP2R, and FP2L data are normally distributed, p-value <0,05 (p = 0,001). There is a correlation (Sig FP2R = 0.200 (p >0,05), with an intermediate correlation level between the right (r = 0,353) and left (r = 0,400) phalanx bone length in men and the right (r = 0,464) and left (r = 0,479) phalanx bone length in women of Bataknese people. It is concluded that proximal phalanx II has a correlation with body height with an intermediate correlation level (r = 0,353- 0,479), so proximal phalanx II is the best predictor for body height.

Keywords: body height, phalanx proximal II length

Introduction

From Various incidents like natural disasters, murder, terrorism, mutilation, and fire may leave body parts in an unidentifiable state, such as, damaged and cut corpse or only bones are left[1,4,7,37].

The province of North Sumatra is one of the regions that is susceptible to natural disasters, with 493 natural disasters with 2015-2016, flood itself comprised 299 of the 493 natural disasters. There are also a lot of accidents that happen in North Sumatra. On 18 June 2018, the accident of Sinar Bangun motorboat in Lake Toba, North Sumatra caused by overload of passengers, resulted in a high number of missing and dead people[4].

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The identification process of natural disasters is similar to criminal suspect identification, which is the most important process of an investigation. Disaster victim identification must be done right to prevent a fatal mistake in an investigation[5].

A study regarding body height estimation from phalanx bone has been done by Iyoti Agrawal ed.al from S.N. Medical College, Jodhpur, North India, which identify body height from the phalanx bone of university students and staff ranging from age 17-30[14].

Until now, author has never found any study regarding body height estimation based on the proximal phalanx II bone based on radiographic info in Bataknese people. Therefore, this study aims to examine the correlation between body height and proximal phalanx II bone in Bataknese people.

Methodology

This is a correlation analysis study which aims to find the relationship between the phalanx bone and the body height. A cross sectional approach is used where data is retrieved only once in a specific time span. In doing so, the objective of this study is to examine the correlation between the proximal phalanx II bone and the body height in Bataknese people. The study is done in Materna Hospital Medan, North Sumatra, from June 2024 until the minimal number of the study subjects is reached. There are 56 respondents according to the sample size calculated based on the sample size formula for numerical correlative analysis, with an estimate of the minimum correlation coefficient considered meaningful set at 0.4, which includes 37 women and 19 women within the age of 21-25. The inclusion criteria used in this study are: adult Bataknese people, age 21-25, able to stand up without help from other people, willing to take part as a subject in this research by signing the informed consent, no history of fracture in right and left hand, no physical disability, and no congenital bone abnormality.

Meanwhile the exclusion criteria include: has history of hand and fingers fracture, unable to stand up without help from other people has physical disability, has history of surgical intervention for the bone of hand and finger, and has bone abnormality such as scoliosis, kyphosis, lordosis, and dwarfism.

Body height is measured with Wireless Body Height Meter from Onemed, product number HT-721, which measures up to 200cm and its accuracy is approximately ±0,1 cm, with a 35x16 cm LCD monitor, powered by 3 AAA battery, measures body height from the highest point (vertex) to the lowest point (heel/ floor) using ultrasonic from GEA. For body height measurement, respondents must stand upright without footwear, with 4 points (the back of the head, back, buttocks, and heels) pressed against the wall with the head facing straight forward. Wireless Body Height Meter is placed on top of the scalp, against the wall. While respondents move to the right and left, the button is pressed to measure the body height[31, 36].

The measurement of the proximal phalanx II is done after respondents submit the questionnaire, sign the agreement letter to be part of the study, and measure their body height. Respondents will then undergo X-Ray for both of their hand, which is then used to measure the length of the proximal phalanx II by drawing a line along the bone axis from the proximal to the distal point of the bone. The length of this line is measured in millimeter unit.

This research was carried out after obtaining ethical clearance approval from the Health Research Ethics Committee of the University of North Sumatra no. 731/KEPK/USU/2024.

Results and Discussion

The results of the descriptive analysis concerning age, height, length of the right and left proximal phalanx II based on male and female gender with the following results.

Table 1: Descriptive statistics

N =56	Categories	male	female
Age (years) 21-25	The Oldest	23	24
	The Youngest	22	21
	Mean	22,74	22,68
Height	The Oldest	180	167
	The Youngest	162	149
	Mean	172,29	159,10
FP2R (cm)	The Oldest	4,846	4,343
	The Youngest	3,758	3,545
	Mean	4,333	3,948

Continue.....

FP2L (cm)	The Oldest	4,864	4,490
	The Youngest	3,868	3,571
	Mean	4,346	3,988

Table 1 above illustrates the amount of data in the variables. The total respondents in this study were 56 respondents divided into 37 female respondents and 19 male respondents. The oldest age in the male respondent group was 23 years old, while the youngest was 22 years old. The average age in the male group was 22.74 years old. In the female respondent group, the oldest age was 24 years old and the youngest was 21 years old, and the average age in the female group was 22.68 years old. The highest height in the male respondent group was recorded at 180 cm, while the lowest was 162 cm. Meanwhile, the average height in the male group was 172.29 cm. Meanwhile, in the female respondent group, the highest height was 167 cm, and the lowest was 149 cm. The average height in the female group was 159.1 cm. From table 1 above, it shows that for both height and length of the right and left proximal phalanx II bones at the same age, the male gender has a larger size.

QQ PLOTS Normality Test on Dependent Variables Height (TB), PF2R. FP2L

Based on the qq plot normality test image of the dependent and independent variable data, it was found that the data for the variables Height and right and left proximal phalanx II, most of the data distribution values are located around a straight line, so this shows that the dependent and independent variable data are normally distributed.

Pearson Correlation Test Result

Table 2: Correlation coefficient (level of relationship) of the Proximal Phalanx II bone with height

Gender	Variable	Correlation
Man	F2PR	0,353
	FP2L	0,400
	FP2R, FP2L	0,961
Woman	FP2R	0,464
	FP2L	0,479
	FP2R, FP2L	0,971
Male Female	FP2R	0,696
	FP2L	0,684
	FP2R, FP2L	0,976

In the male data set, the results of the Pearson correlation above show a correlation between height and the right and left proximal phalanx II bones in men, the correlations obtained are: FP2R with TB (r = 0.353), FP2L with TB (r = 0.400), FP2R, FP2L with TB (r = 0.961)

In the female data set, the results of the Pearson correlation above show a correlation between height and the right and left proximal phalanx II bones in women, the correlation obtained is: FP2R with TB (r = 0.464), FP2L with TB (r = 0.479), FP2R, FP2L with TB (r = 0.971).

In the male and female data sets, the results of the Pearson correlation above appear to show a correlation between height and the right and left proximal phalanx II bones, the correlations obtained are: FP2R with TB (r = 0.696), FP2L with TB (r = 0.684) and FP2R, FP2L with TB (r = 0.976). So it can be concluded that there is a statistically significant correlation between FP2R, FP2L with TB with a low to very strong correlation level.

Linear regression formula, the results of linear regression analysis produce 9 formulas with varying levels of accuracy.

Table 3. Height estimation formula from the right and left proximal *phalanx IIbones* based on gender.

Sex	Variable		Correlation (r)	SEE
Man	FP2R	Height = 141,381 + 7,133 (FP2RM) ± 4,71	0,353	4,71
	FP2L	Height = 134,098+ 8.788 (FP2LM) ± 4,61	0,400	4,61
	FP2R, FP2L	Height = 132,41 – 8,262 (FP2RM) + 17,414 (FP2LM) ± 4,72	0,961	4,72
Woman	FP2R	Height = 121,323 + 9,586 (FP2RF) ± 4,29	0,464	4,29
	FP2L	Height = 123,205 + 8,999 (FP2LF) ± 4,25	0,479	4,25
	FP2R, FP2L	Height = 123,434 – 0,539 (FP2RF) + 9,475 (FP2LF) ± 4,31	0,971	4,31
Man /Woman	FP2R	Height = 88,025 + 18,523 (FP2RMF) ± 5,73	0,696	5,73
	FP2L	Height = 88,623 + 18,237(FP2LMF) ± 5,82	0,684	5,82
	FP2R, FP2L	Height = 87,656 + 15,926 (FP2RMF) + 2,667 (FP2LMF) ± 5,78	0,976	5,78

Description: FP2R: Right Proximal Phalanx II Bone Length : FP2L: Left Proximal Phalanx II Bone Length ; FP2LR: Left and Right Proximal Phalanx II Bone Length; FP2RW: Right Proximal Phalanx II Bone Length Female; FP2RM: Right Proximal Phalanx II Bone Length Male; FP2LF: Left Proximal Phalanx II Bone Length Female, FP2LM: Left Proximal Phalanx II Bone Length Male; FP2RLM: Left and Right Proximal Phalanx II Bone Length Male; FP2RLF: Left and Right Proximal Phalanx II Bone Length Female.

In this study, the lowest Standard Error Estimate was found at 4.25 (SEE=4.25) in the left proximal phalanx IIbone of Bataknese women. This shows that the accuracy in determining the height of the Bataknese people using the left proximal phalanx II bone of women is more accurate.Tabel 4.comparison of the results of this study with other studies

		Researcher	Jasuja (Etnis Jat Sikh)	Panjakash Karnataka Utara	Jaiswal (Etnis Karwar)	Actual height
MALE	left	173,2	195,2	154,7	194,4	175,3
	Right	172,1	192,3	150,0	189,4	
FEMALE	left	160,4	166,5	113,2	165,0	165,4
	Right	159,0	172,9	155,6	166,2	

From the table above, it can be seen that the regression results from our research are closer to the actual height value compared to the results of previous studies. In Jaiswal's research on the Karwar ethnic group, the results for females were quite good, but for males, the results were too large from the actual height value. So it can be concluded that the formula we obtained can be recommended for estimating height from the length of the proximal phalanges for the Batak tribe in forensic identification cases that require height measurements.

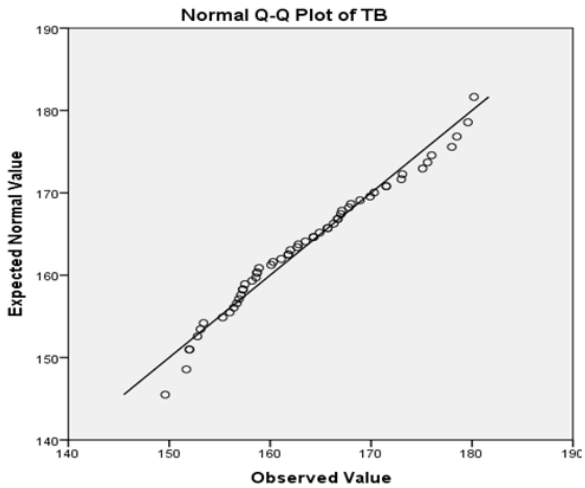

Figure 1: Q-Q PLOTS graph of height normality (TB)

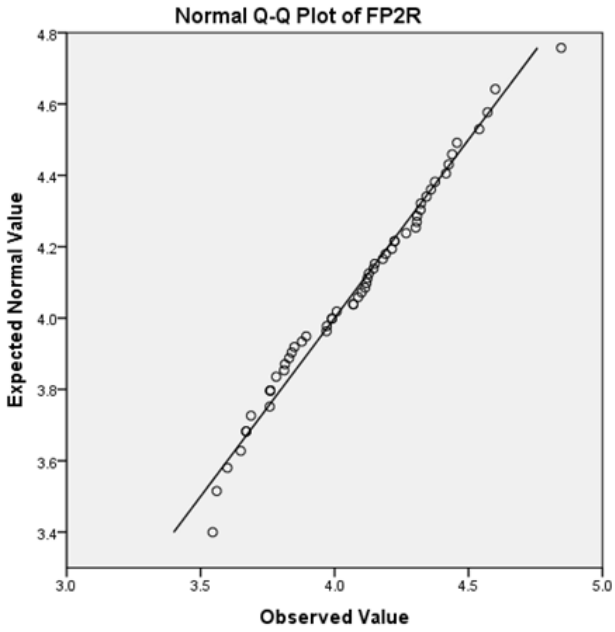

Figure 2: Q-Q PLOTS graph of the normality of the independent variable of the right proximal phalanx II (FP2R)

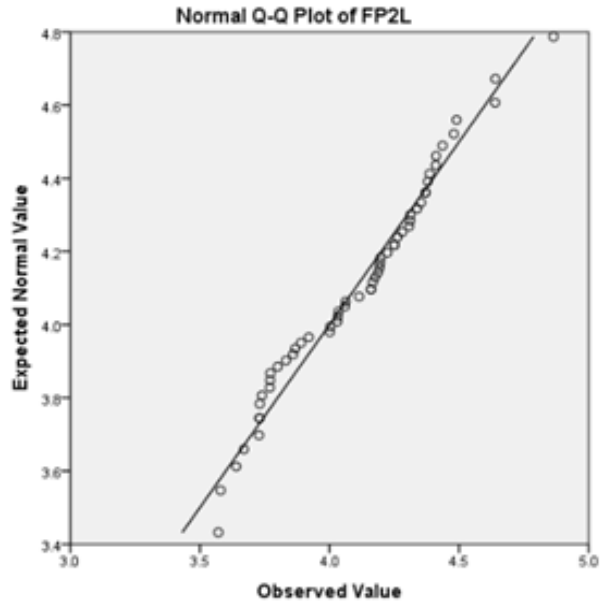

Figure 3: Q-Q PLOTS graph of normality of the independent variable of the left proximal phalanx II (FP2L)

Conclusion

From this study it was concluded that the proximal phalanx II has a relationship with height with a low to very strong correlation level (r = 0.3 – 0.9).

The influence of the proximal phalanx II on height is 7% to 48.4%, with the lowest Standard Error Estimate of 4.25 (SEE = 4.25) in the left proximal phalanx II of women. So that the left proximal phalange 2 of women can be the best (most accurate) predictor in estimating height with the formula TB = 123.205 + 8.999 (FP2LF) ± 4.25.

There are many variations in estimating stature from proximal phalanx bone measurements of people from different regions and races. so there is a need to do more research among people from different regions and ethnicities so that stature estimation becomes more reliable and individual identity is easy to determine

Conflict of interest: Estimasi of stature from any body remains especially proximal phalanges, which has an importance in forensic medicine in our country (Indonesia).

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Original Article

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Impact of Effective Communication and Empathy Skills Awareness Training for Non-Judicial Officers

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Abstract

Background: Working life constitutes a significant aspect of adulthood. Non-judicial officers in courthouses frequently encounter vulnerable groups, leading to potential issues such as crises, anger outbursts, and communication breakdowns. Given this context, enhancing empathic self-efficacy skills among these officers is essential to help mitigate potential challenges.

Objectives: For this purpose, our study examined the impact of awareness training to improve the effective communication and empathy skills of non-judicial officer working in a courthouse in the Eastern Mediterranean Region.

Material and Methods: The "Perceived Empathic Self-Efficacy and Social Self-Efficacy Scale" was performed to the participants before and after the awareness training.

Results: Among the 302 non-judicial officers in the study, 55.6% were male and 44.4% female. Service duration showed that 25.8% had 1-5 years of experience, while 24.5% had 16 or more years. Analysis of daily communication with defendants revealed that 25.5% interacted for less than one hour per day. A statistically significant difference was observed in empathic self-efficacy mean scores pre- and post-training, following the educational program for non-judicial officers (p=0.014).

Conclusion: As a result, it is thought that providing therapeutic jurisprudence awareness trainings to non-judicial officers to improve their effective communication and empathy skills is important in the face of increasing workload.

Key words: Non-judicial officer; Perceived Empathic Self-Efficacy; Social Self-Efficacy; Awareness Training

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Introduction

Therapeutic jurisprudence, emerging quietly in the U.S. in the late 1980s, is now applied in drug, domestic violence, and mediation courts. In Turkey, while not formally conceptualized, this approach underpins probation and mediation practices. The framework, established by Wexler and Winick, emphasizes law's therapeutic effects.[1]This concept, using an interdisciplinary approach, examines both therapeutic and non-therapeutic legal outcomes, emphasizing the treatment of individuals within the legal system. In drug and mediation courts, judges are expected to base decisions on preventive, curative, and therapeutic principles. Beyond the legal relationship between judge and convict, the interactions within court processes impact individuals' understanding and resolution of crime. Central to this is the decision-makers' empathy and recognition of "rejection" and "acceptance" behaviors, drawing from behavioral psychology and motivational theory.[2]

Interdisciplinary studies in the early 2000s focused on how well judges could apply therapeutic principles in specialized courts, like drug courts.[3-9]Unlike traditional courts, drug court judges often see themselves as therapeutic agents involved in defendants' treatment rather than merely as authority figures. Emphasizing therapeutic approaches and psychosocial support is believed to promote a restorative justice perspective among judges.

In Turkey, the procedural processes before and on the lawsuit, date are as crucial as the court hearings. The communication patterns established by non-judicial officers during prosecution can have significant short- and long-term effects on defendants, regardless of the penalty imposed. Therapeutic jurisprudence seeks to promote social rehabilitation for offenders from the crime's commission through to conviction.

Working life, a key developmental task in adulthood, fulfills individuals' economic, psychological, social, and cultural roles through physical or mental labor. Professions requiring constant face-to-face interaction can heighten anxiety, influenced by working and living conditions.[10]Public personnel in courthouses, prisons, hospitals, and social services often work with vulnerable groups due to the nature of these institutions. As a result, they frequently encounter crises, anger, and communication issues arising from these groups or their relatives. Developing empathic self-efficacy among public personnel is essential for reducing potential problems. Non-judicial officers, in particular, face a highly stressful environment, regularly interacting with defendants and their families in the judicial system[11] and have to work with the defendants and their relatives requires them to develop their ability to communicate empathetically and effectively in terms of therapeutic jurisprudence principles.

In our study, the effectiveness of awareness training given to non-judicial officers working in a courthouse in Turkey-Eastern Mediterranean Region to develop effective communication and empathy skills was examined.

Material and Methods

In this study, one group pretest-posttest model, which is one of the weak experimental models, was used. The symbolic view of the research model is shown in Figure 1. Accordingly, in this model, first a single group (G) is made the pretest measurement (O1), then the experimental procedure is applied (X), and at the end of the experimental procedure, the final test (O2) is done.[12] In this study, the effect of awareness training (X) prepared for non-judicial officers and awareness training (dependent variable) on improving the officer's effective communication and empathy skills was examined.

Single Group Pretest-Posttest Pattern

Group A	O_1	———	X	——— O_2

O_1: Perceived Empathic Self-Efficacy and Social Self-Efficacy Scale

O_2: Perceived Empathic Self-Efficacy and Social Self-Efficacy Scale

X: Awareness Training for Staff to Develop Effective Communication and Empathy Skills

Population and Sample of the Research

The research universe includes all personnel at the regional courthouse, with the sample selected via

convenience sampling. In this method, the researcher exercises discretion, and not all individuals have an equal chance of selection. This approach is used to quickly gather data and is suitable for studies where staff participation may be challenging to secure.[13]

Inclusion criteria in the study

- Being 18 years of age or older
- Not having any communication problems
- Tovolunteer

Data Collection

Data were collected using a "Sociodemographic Data Collection Form" and the "Perceived Empathic Self-Efficacy and Social Self-Efficacy Scale," designed by the researcher to capture participants' characteristics. The "Perceived Empathic Self-Efficacy and Social Self-Efficacy Scale" was administered twice, pre- and post-awareness training, to assess changes in effective communication and empathy skills among courthouse personnel.

- Sociodemographic Data Collection Form: In the form we prepared, there are questions about the age, marital status, years of service, corporate belonging and short-term plans for the future.

- Perceived Empathic Self-Efficacy and Social Self-Efficacy Scale: The Perceived Empathic Self-Efficacy and Social Self-Efficacy Scale, developed by Di Giunta et al.,[14] consists of 11 items and two dimensions and a 5-point Likert type ("1" Not appropriate at all, "5" fully appropriate). High scores obtained from the first sub-dimension of the scale, empathic self-efficacy, show the individual's perception of being able to respond empathetically to the needs and feelings of other people. High scores obtained from the second sub-dimension, social self-efficacy, indicate that the individual perceives himself as competent in initiating and managing interpersonal relationships. The Cronbach's alpha internal consistency reliability coefficients of the scale ranged from .66 to .81. In the validity study, positive correlations were found between empathic self-efficacy and empathy (r =.53), and between social self-efficacy and energy-extraversion (r =.57). In addition, positive relationships were found between empathic self-efficacy and social self-efficacy, psychological well-being (r = .23 and r = .44, respectively), active coping (respectively; r =.22 and r =.31), emotional support (respectively; r = .22 and r = .16) and self-esteem (r = .12 and r = .33, respectively).[15]

Procedure

The researchers provided training on empathic and effective communication, communicating with vulnerable groups, communicating with the opposite sex, crisis management, anger control and interpersonal problem-solving skills, covering a total of 12 hours, 2 hours a week for 6 weeks. A pilot study was conducted by the researchers on the training to be given to a group of 12 adult university students aged 18-29. The content of the training was subsequently revised in accordance with the feedback received. This awareness training was held in their own institution buildings, with the condition of not obstructing the working hours and workflow, taking into account the voluntariness of the participating personnel, provided that permission was obtained from the relevant institution.

Our general aim is to improve the communication skills of personnel working with vulnerable groups and their relatives in a public institution (courthouse) in the Eastern Mediterranean region. The six weeks of skill training are as follows:

1. Developing empathic and effective communication skills
2. Communicating with vulnerable (disadvantaged) groups
3. Developing the ability to communicate with the opposite sex
4. Developing crisis management skills
5. Developing anger management skills
6. Developing interpersonal problem-solving skills

Analysis of Data

SPSS 26.0 package program was used in the statistical analysis of the data. In the study, all analyzes were taken as 95% confidence interval, type 1 error level as 5%. Significant application effects were then explored using the Wilcoxon analysis for each group separately.

Ethical Dimensions

This study was conducted with approval from the Çukurova University Non-Interventional Clinical

Research Ethics Committee (dated 14.02.2020, number 96/35). Further, we obtained institutional permission from the faculty and permission from the developers of the instruments used in this study. In addition, participation was voluntary, and non-judicial officer's consent was obtained by providing the necessary explanations on the form.

Results

Table 1: Sociodemographic characteristics of non-judicial officers

VARIABLES (n=302)		Number (%)
Gender	Male	168(55,6)
	Female	134(44,4)
Marital status	Single	85(28,1)
	Married	195(64,6)
	Divorced	20(6,6)
	Partner passed away	2(0,7)
Educational status	Highschool	24(7,9)
	Associate degree	90(29,8)
	Bachelor's degree	188(62,3)
Number of children	Childless	101(33,4)
	One child	67(22,2)
	Two or more children	134(44,4)
Family income status	Very good	4(1,3)
	Good	60(19,9)
	Normal	191(63,2)
	Insufficient	47(15,6)
Years of service	1-5 years	78(25,8)
	6-10 years	67(22,2)
	11-15 years	83(27,5)
	16 yearsor more	74(24,5)
Communication status with the clients during the day	Less than 1 hour	77(25,5)
	At least 1 hour	92(30,5)
	2 hours or more	133(44,0)
Love of work	I don't like it at all	28(9,3)
	I like it a little	40(13,2)
	I like it	192(63,6)
	I love it	42(13,9)
Desire to continue in the current unit	I want	190(62,9)
	I don't want	112(37,1)

Our study found that 55.6% of the non-judicial officers attending the training were male, and 44.4% were female. In terms of service years, 25.8% had worked for 1-5 years, while 24.5% had served for 16 years or more. Regarding daily client interactions, 25.5% of participants communicated with clients for less than one hour per day. Additionally, 13.2% reported their corporate belonging as "I like it a little," while 9.3% expressed "I don't like it at all."

Table 2: Comparison of pre-test and post-test results of empathic self-efficacy and social self-efficacy mean scores of non-judicial officers

Scale Means	Pretest		Posttest		p*
	n	±S.D. Median [Min- Max]	n	±S.D. Median [Min- Max]	
Perceived Empathic Self-Efficacy(E.S.E.)	302	24,54±2,72 24 [15-30]	302	24,83±2,74 24 [16-30]	0,014
Social Self-Efficacy (S.S.E.)	302	21,02±2,44 20 [12-25]	302	21,09±2,43 20 [13-25]	0,565

p<0,05*

According to the findings of our study, the E.S.E and S.S.E sub-dimension mean scores were examined by Wilcoxon analysis, it was observed that there was a statistically significant difference in the mean E.S.E scores of all non-judicial officers with the training given (p=0.014).

Table 3: Comparison of pre-test and post-test results of empathic self-efficacy and social self- efficacy scale subscale mean scores of non-judicial officers according to gender variable

Gender	E.S.E. Pretest-Posttest ±S.D. Median [Min- Max]		p**	S.S.E. Pretest-Posttest ±S.D. Median [Min- Max]		p
Female (168)	24,87±2,76 24,50 [17-30]	25,01±2,90 24 [16-30]	0,317	21,01±2,64 20,50 [12-25]	21,12±2,57 21 [13-25]	0,505
Male (134)	24,12±2,64 24 [15-30]	24,59±2,52 24 [18-30]	**0,015**	21,03±2,16 20 [15-25]	21,04±2,26 20 [15-25]	0,928
p*	0,018	0,179		0,966	0,776	

p<0,001*p<0,05**

As shown in Table 3, the impact of training on the E.S.E and S.S.E sub-dimensions was analyzed by "gender." A statistically significant difference was found between pretest E.S.E scores of female and male non-judicial officers (p=0.018), though no significant difference was observed in posttest scores. Additionally, male participants showed a statistically significant difference between their E.S.E pretest and posttest scores (p=0.015).

Table 4: Comparison of pre-test and post-test results of empathic self-efficacy and social self- efficacy scale subscale mean scores of non-judicial officers according to daily communication time

Daily Communication Time	E.S.E. Pretest-Posttest ±S.D. Median [Min- Max]		p**	S.S.E. Pretest-Posttest ±S.D. Median [Min- Max]		p
Less than 1 hour (77)	24,23±2,73 24 [15-30]	25,63±2,69 24 [19-30]	0,008	21,01±2,49 21 [12-25]	21,00±2,64 20 [13-25]	0,963
At least 1 hour (92)	24,84±2,54 24 [18-30]	24,97±2,69 24 [19-30]	0,519	21,31±2,48 21 [15-25]	21,20±2,57 21 [13-25]	0,578
2 hours or more (133)	24,52±2,83 24 [15-30]	24,68±2,82 24 [16-30]	0,341	20,83±2,37 20 [12-25]	21,07±2,20 20 [14-25]	0,095
p	0,356	0,696		0,337	0,866	

p<0,001* p<0,05**

The effect of the education given in Table 4 on the sub-dimensions of E.S.E and S.S.E was examined according to the variable of "daily communication time with clients". According to this, a statistically significant difference was found when the E.S.E sub-dimension score averages of the participants who stated that they communicated with clients less than an hour a day were examined. (p=0.008)

Discussion

Empathic self-efficacy is defined as an individual's perceived ability to understand others' emotions from their perspective, respond appropriately to feelings of distress or misfortune, and recognize the impact of emotions.[1617] Empathy can enhance interpersonal communication in daily life and improve dialogue between officers and clients in public services. Full compliance of the accused with punishment, execution, and correction processes is vital for justice and reintegration into society. Given defendants' reservations and resistance due to challenging experiences, the communication non-judicial officers establish with them should be constructive, positive,

and sustainable. In their study, Westaby et al. (2020) stated that the work of probation personnel, another type of non-judicial officer, requires emotional labor, and therefore factors such as humor, empathic approach and anger control are included in this emotional labor.[18] The presence of verbal and bodily expressions during communication, particularly in conveying rules and instructions to the accused, is an observable action within the environment.[19] In such cases, the emotional tone of the information conveyed also becomes significant. For healthy communication, it is essential not only which emotions are expressed but also how they are conveyed.[20] When one looks at the judicial process practices in Turkey, it may be interpreted that non-judicial officers adopt an organizational approach[21] in which empathic contact is relatively lacking rather than a societal or therapeutic approach in the communication patterns in which they take an active role. However, it has been determined that the empathic approach is effective in reducing pro-social modeling and recidivism in probation practices.[22]

Empathic behavior or empathic self-efficacy as a derivative of empathy shows some differences on the basis of gender. According to studies, it has been observed that women show more and more empathetic patterns compared to men, especially after puberty.[23,24] Pretest results in our study showed that female participants had significantly higher empathic self-efficacy scores than males. However, posttest comparisons suggest that male participants benefited more from the training in terms of empathic self-efficacy. While this finding indicates potential gender-based differences in the effectiveness of awareness training, it is challenging to draw firm conclusions.

One of the important elements of empathic self-efficacy or empathetic behavior is being open to communication. Recognizing the emotional and intellectual sharing that occurs with mutual interaction by individuals and giving appropriate feedback depends on their empathic self-efficacy levels.[25,26] The empathic quality of dialogue between non-judicial officers and clients also depends on the duration of interaction. In busy public institutions like hospitals, municipal buildings, and courthouses, communication is often brief due to intense working conditions.[27] Limited communication and low number of words are insufficient to develop empathy. Non-judicial officers in the psychoeducation process work under varying conditions based on their roles, affecting the length of interactions with clients and their relatives. Posttest measurements showed that participants with communication times of less than one hour had higher average scores than others. Since work life holds a central place in people's routines, interpersonal communication skills become crucial. However, individuals with limited interaction time due to their job roles may show lower levels of empathic skills compared to those with more extensive communication. In this context, it has been observed that the training given is effective in individuals with relatively shorter communication times comparing who has more time to communicate with clients and entourage.

In conclusion, an empathic approach is essential for non-judicial officers to provide therapeutic jurisprudence in interactions with defendants and their families. Psychoeducation appears to have positively contributed to the development of empathic self-efficacy. While training varies globally, in Turkey, personnel training is prioritized and supported through numerous in-service programs.

Awareness training in therapeutic jurisprudence for non-judicial officers can enhance communication and empathy skills, helping to reduce stress and foster a sense of belonging amid increasing workloads. Establishing active psychological counseling and guidance units in courthouses could improve service quality and help minimize communication conflicts among staff, citizens, and other courthouse visitors.

Limitations

Our study also has some limitations. The setting where the study was conducted is a large and multifunctional structure serving the region with thousands of people daily. In this context, even if the participation of nonjudicial officers in the training and research is voluntary, the fact that the follow-up test cannot be performed again with the same participant group is due to the intensity in the operation of the institution and the termination of the protocols between the researchers and the institution. In this context, although the one group

pretest-posttest design[2728] used in the research design has weaker representation power compared to true experimental designs, it can still be used to detect some changes. According to Campbell and Stanley (2015), the reason behind the difference between the measurements of the group may be due to time-dependent changes such as "natural" maturation.[29] Given the sample's average age and the experience-based nature of empathic self-efficacy, the significant difference between pre- and post-measurements may stem from the training.

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