

INTERNATIONAL JOURNAL OF ETHICS, TRAUMA & VICTIMOLOGY



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International Journal of Ethics, Trauma & Victimology being released at the 7th Conference of Society for Prevention of Injuries and Corporal Punishment at GMC, Chandigarh



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INTERNATIONAL JOURNAL OF ETHICS, TRAUMA & VICTIMOLOGY

Journal supported by

Society for Prevention of Injuries and Corporal Punishment (SPIC)
Indo Pacific Academy of Forensic Nursing Science (INPAFNUS)

AIMS AND SCOPE

This journal is published to expand the academic activities and spread the knowledge, ideas and latest research in the field of ethics, trauma, and victimology. This journal publishes original research papers, review articles, case reports, letters to the editor and review of books on ethics, trauma, and victimology. This journal is supported by the Society for Prevention of Injuries and Corporal Punishment (SPIC) and Indo Pacific Academy of Forensic Nursing Science (INPAFNUS). This journal is supporting the aims of the SPIC and the INPAFNUS. This journal also highlights the achievements of the SPIC, INPAFNUS and their members.

This journal covers the various aspects of ethics, evidence-based medical ethics, ethical dilemmas and various dynamic issues related to ethics. It also covers the ethical issues related to Forensic Nursing Science, Forensic Odontology, and Forensic Psychiatry. It also covers the ethical aspects of Toxicology including Environmental Pollution. It covers issues related to all sorts of corporal punishment and their prevention, particularly in schools. It covers physical as well as psychological aspects of trauma and clinical forensic medicine related to all types of injuries and prevention of injuries. It covers all aspects of victimology including etiology, crime scene investigation, and prosecution.

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Issuance

Half Yearly

The first volume of the journal published in 2015**Founder Editor in chief**

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**Published by
Forensicwayout**

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#E-209, FF, R1, DLF Hyde Park, New Chandigarh,
PO. Mullanpur Garibdas,
Distt. SAS Nagar, Punjab,
India 140901
Phone number: +919872020840
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Printed at

Zenith Design World,
22 No. Phatak, Patiala 147001 Punjab India
Phone number:+919872666799
Email: zafar.zenith@gmail.com

ISSN Numbers

ISSN-L: applied for
P-ISSN: 2394-6822
e-ISSN: 2395-4272

**International Journal of Ethics, Trauma & Victimology
(Online)**

Available online at
<http://ijetv.org/index.php/IJETV>

**Indexed with
Index Copernicus at**

<https://journals.indexcopernicus.com/search/details?id=45254>

Citefactor at

<http://www.citefactor.org/journal/index/11666#.WskhtKWbDc>

Scilit at

<https://www.scilit.net/journals>

CINAHL Ultimate**The volume of Distribution**

1000 copies

Review Process

It is a peer-reviewed journal. The double-blind review process is followed.

Funding Bodies

Support by SPIC, INPAFNUS and donations from philanthropists and advertisements in the journal.

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Online Submission at

Email: editoretv@gmail.com

Address request for a reprint or further information relating to any article may please be made with the author and in the case of multi-author, please communicate with the corresponding author.

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Subscription Information

Rs. 5000 (Abroad US\$ 120 or Equivalent)/issue)
Rs 10,000/Year (Abroad US\$ 200 or Equivalent)/year)

Subscription should be addressed to:

Zenith Design World, 22 No. Phatak,
Patiala 147001 Punjab India
Phone number: +919872666799
Email: zafar.zenith@gmail.com

Claims for Missing Issues

A copy will be sent to subscriber provided the claim is made within 2 months of issue of the journal and a self-addressed envelope of the size of 9"x12" duly stamped is sent to the editor in chief (those of who want the journal to be dispatched by registered mail should affix appropriate Stamps)

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IJETV

A Half-Yearly Publication
Volume 9 (2), 2023

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From the Editor's Desk

It gives me immense pleasure to present to you the 2nd issue of the 9th volume of the International Journal of Ethics, Trauma and Victimology. This is possible only due to the unstinted support of the contributors, reviewers, members of the editorial board and the publisher. I convey my gratitude to all of them.

I also thank the members of the Executive Committees of 'The Society for Prevention of Injuries & Corporal Punishment', and 'Indo Pacific Academy of Forensic Nursing Science' for their continuous support of publishing this journal without any submission charges and making it a Free Access Journal for the wider dissemination of research works and knowledge.

The Editorial Board is trying its best to get it indexed in other databases also.

I convey my good wishes and regards to all the readers

Dr. Rakesh K Gora

INTERNATIONAL JOURNAL OF ETHICS, TRAUMA & VICTIMOLOGY

IJETV, VOL. 9 (2), JULY - DECEMBER, 2023

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The Decade of Action on Road Safety and Injuries Prevention: The Media Challenge in the 21st Century

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ABSTRACT

Deaths and serious injuries are the challenges of the future due to the increasing load of vehicles on the road. Advertising and media campaigns for road safety are commonly employed by various agencies and governments. Effective planning to use these tools is needed to reduce the burden of morbidity and mortality due to the use of the roads. In the 21st century, with the expansion of roads and the increase in the number of vehicles, the threat of road crashes is also increasing. Different media are used to advertise and run campaigns for road safety. There is a strong need to understand the challenges to the media and effectively address these challenges to avoid serious injuries and deaths on the roads.

Keywords: Injury prevention, Road safety, Media challenge, Advertisements, Media campaigns.

Int J Eth Trauma Victimology (2023). DOI: 10.18099/ijetv.v9i02.01

INTRODUCTION

Decade of Action of Road Safety and Injury Prevention

A UN resolution was adopted to celebrate the 2nd decade of action on road safety and reduce road crashes by 50% by the end of 2030.

A total of 1.3 million people die and 20 to 50 million people get injured due to road traffic accidents.¹ It is the eighth leading cause of death in the world and going to become the seventh leading cause of death by 2030. It is the leading cause of death in people from 5 to 29 years of age.^{2,3}

In India, 4,12,432 road accidents occurred during the year 2021, with 1,53,972 deaths and injuring 3,84,448 persons. India is leading in the deaths due to accidents in the world. India has an 11% share of the deaths in the world due to road accidents⁴ and is the leading cause of death in the age group of 5 to 29 years in India.³

In Nigeria, 1,834 people died in 3,345 road accidents from January to March 2022 and the main causes of these accidents were violations of speed and road signs, dangerous driving, overtaking wrongly, and bursting of tyres.⁵

In the first decade of action for road safety, five important aspects of road safety management, safer vehicles, safer road users, post-crash response, and safer driving environment were considered. These objectives were continued in 2nd decade of action (2021–2030) so that deaths and major injuries were prevented and their rate is reduced to 50% by the end of 2030. Traffic accidents remain a major health and developmental problem especially in some developing countries though some of the developing and developed countries have taken many steps to improve this situation.⁶

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How to cite this article: Gorea RK. The Decade of Action on Road Safety and Injuries Prevention: The Media Challenge in the 21st Century. *Int J Eth Trauma Victimology*. 2023;9(2):1-5.

Source of support: Nil

Conflict of interest: None

Received: 10/09/2023;

Received in revised form: 21/11/2023;

Accepted: 27/11/2023;

Published: 20/01/2024;

A plan for 2nd decade of action on road safety was released in October 2021. It emphasized a holistic approach to improve the laws and implementation of laws, improvement of roads and vehicles, and proper care and treatment of crash victims along with the promotion of Stockholm's Declaration highlighting the right of all individuals to be able to enjoy the highest level of health and involving the promotion of public transport, cycling and walking. Reduction of accidents is required for the sustainable development of the world.⁷⁻⁹ This was supported by the 3rd Global Ministerial Conference on Road Safety in which 80 countries participated.¹⁰

In secondnd decade of action on road safety has set 12 global road safety performance targets and tells what is to be done, by whom it is to be done and how it has to be done. It asks all countries to have a comprehensive multisectoral national road safety action program with time-bound targets by 2030; by 2030 all countries must accede to one of the core road safety-related UN legal instruments; all roads made should have at least a three-star rating; 75% of roads should have these standards; 100% new and old vehicles should have UN Regulations, Global Technical Regulations, or equivalent

recognized national performance requirements; half of the vehicles must travel at the posted speed limit; nearly 100% motorcyclists should use right type of the helmet; usage of car belts and child restraints in nearly 100% vehicles; halve the road traffic injuries and deaths; all countries to have laws prohibiting the use of mobile phones while driving; have laws for commercial drivers for rest and driving periods; and to reduce the time between crash and providing of emergency care to the victims. All these targets should be attainable by 2030.¹¹

Media and Its Types

Media is defined as “the main means of mass communication (broadcasting, publishing, and the internet).”¹²

Advertising media are the different platforms by which products or services can be marketed¹³ and it can be through routine advertisements on television, radio, roadside billboards, messaging on mobile phones or different social media.

Road safety advertisements are meant to reach a target population, i.e., all those who use roads and can become victims of road traffic accidents and can be prone to injuries and deaths. Various means can be used including different types of media including social media. Various campaigns like anti-speeding campaigns have shown effective results. These campaigns can be run on various media e.g., using webpages like My space and Internet.¹⁴

Advertisements in the media used can be of different types: video types using television and YouTube; each having its benefits and advantages. TV advertisements are seen when people are relaxing and help to connect with them. On YouTube, it can be shown to those who are using particular types of content.¹³

Advertisements can be of different types varying from informative to persuasive and style can be emotional or humorous. Campaigns have been different at different times starting from respecting the road signs, overtaking is dangerous, drinking affects driving, driving at safe speeds, looking first then go, wearing helmets, wearing seat belts, using child safety restraints, crossing roads by pedestrians.¹⁵

TV advertisements are considered very effective for road safety. But it should be of sufficient duration, sufficient intensity, sufficient exposure and its timings should be good. A campaign lasting for one year is more effective usually. A consistent slogan helps in a better way to understand other things in the advertisement or campaigns. A serious approach is always considered better than a humorous approach. There should be limited themes and ideas for better results in a campaign. A key agency should manage all the advertisements for better results. There should be a combination of public relations and enforcement for better results.¹⁶

Billboard advertisements on the roadside can cause distractions resulting in accidents. The task-capability interface (TCI) model is a useful model for studying the behavior of the driver and roadside advertisements and it was observed that it increases crash risk, especially the digital billboards where information is constantly changing. Roadside billboards

are clutter in the environment and risky for drivers and road safety.¹⁷

Social Media and Its Effectiveness

Social media can be defined as “websites and applications that enable users to create and share content or to participate in social networking.”¹²

Social media is one of the pillars of life nowadays and there are 4.65 billion users of social media at present. In 84% of Americans have at least one social media account, and 1 billion Chinese are users of social media.¹⁸ Another survey finds the number of users at 4.90 billion. A typical user uses 6.6 social media platforms and is used by 85% of people have mobile phones. China is topping the number of users of social media with a whopping number of 1021.96 million users and India has 755.47 million users which in 2027 will become 1177.5 million. On average a person spends 2 hours and 25 minutes of his day on social media. Eastern Asia has the most social media users 26.6% and Central Africa has minimum users 0.46%. Most frequently social media is used by millennials and Gen Z 56% of men and 46% of women use social media. Social media penetration is biggest in the UAE (106.1%), India has a penetration of 33.4% Nigeria has a penetration of 15.4%, the USA has a penetration of 80.9% whereas global penetration is (59.4%).¹⁹

The most influential social media apps are Facebook, X previously known as Twitter and YouTube but for brands, it is Instagram.²⁰

If we consider the monthly active users then Facebook is the most popular social media and has the biggest number of users (2958 million users), and second in the rank is YouTube having 2514 million users, and third in the series is WhatsApp with 2000 million users, followed by Instagram (2000 million), WeChat (1309 million), TikTok (1051 million) Facebook Messenger (931 million), Douyin (715 million), Telegram (700 million), Snapchat (635 million).²¹

Current Scenario of Media and Road Safety

Best practices in the mass campaigns and prevention of road accidents have been researched and it was observed that road safety advertisements can lead by social persuasion to behavioral changes.²²

Integrating advertisements with enforcement can improve mass media campaigns. We should plan the content according to the type of audience. We should choose the means of campaigns also according to the variety of the audience. Multiple forms of media are more effective than a single use of media.²²

At least three exposures to advertisements are needed to be effective. Humorous appeals of road safety are more effective to males and fear appeals are more effective to females. There should always be ongoing surveys for behavioral changes to see the effectiveness of advertisements and road safety campaigns.²²



Campaign objectives should be designed without any ambiguity. Advertisements and media campaign expectations must be realistic as they can give information and change attitudes but rarely change driving behavior and can be useful for setting the agenda. If threat appeals are made then its solution should also be provided so that people can adopt the safety measures. Media campaigns should always be evaluated to see their effectiveness.²²

Awareness of the contents of the campaign helps in changing the results of the campaign. Awareness campaigns help in effective awareness but the cost factor is an important ingredient of these campaigns psychological concepts should also be understood to guide the campaigns. Fear arousal and coping with fear and self-efficacy are important factors that need to be taken into consideration while designing media campaigning.¹⁶

Lebanese road accident platform (LRAP) collects road crash events from online social media and provides input for studying vehicular crashes regarding the 465 billion population, districts, and road lengths along with seasonal changes in these accidents.²³

In Poland most effective way of teaching about road safety is by those persons of road transport inspection who are dealing directly with road safety but the difficult part is putting this experience on the media.²⁴

5G network outperformed LTE in communicating road congestion and road weather conditions and safety-critical messages can be transferred better.²⁵

Media Challenge for the 21st Century

There is going to be an enormous increase in the number of vehicles in the coming years of the present century due to increased availability of vehicles and improvement in the financial conditions of the members of the society as well as increased financing of the vehicles by the various financial agencies. Media will have to modify the advertisements and campaigns for road safety. There is a need to study the ongoing research and plan future research to take care of the media so that media can be effectively used to prevent road crashes. Finances and technology will have to be understood for the better implementation of the campaigns. There is a need to study the failures of the campaigns and effectively plan in the future taking lessons from the previous media campaigns.

MATERIAL AND METHODS

Google Scholar was used with the keywords injury prevention, road safety and media challenge. Google search was also used to find authentic facts not available on Google Scholar.

DISCUSSION

Advertisements and media campaigns for road safety can be effective. What is needed at a particular place can be decided according to the budget and effectiveness of the media in a particular environment. In a region where internet and instruments to use are less, billboard advertisement can be

useful. Where people are uneducated pictorial advertisements can be more useful. In a society with abundance, social media can be better utilized. Where people prefer to stay indoors TV and radio campaigns may be more useful.

For the mass media campaigns to be successful timing and duration of the campaign as well as exposure of media placements and their intensity is very important and should be taken into consideration. Persuasive and emotional appeals seem to be more effective as compared to rational appeals just giving knowledge and are more effective if backed by theoretical models.¹⁶

Campaigns have been developed mostly to avoid overspeeding, avoiding drunk driving, using helmets, using seat belts and child restraints.²⁶ Over speeding is responsible for 40% of accidents in young persons and inculcation of fear among young persons through media campaigns can be a good way to reduce the accidents.²⁷

We need to consider the following and plan accordingly for the use of media for road safety and prevention of injuries:

Awareness Challenges

The population using the roads must be aware of the changing threat scenarios with the change in vehicular and road patterns. The development of highways and increase in the speed limit may bring altogether new types of threats to driving. Road users must be aware of the emerging challenges.

Budgetary Challenges

There is a strong need for sufficient funds to be allotted for advertisements and media campaigns while allocating the budgets in the countries and various organizations.

Unaffordability Challenges

Some poor countries may know what changes are good to be adopted on the roads but they may not be able to afford it. The UN must take into consideration such countries and should plan accordingly to attain its goals.

Corruption Challenges

In some countries, corruption may be a big issue and despite the funds available may not reach the community to save them from road crashes. Effective laws and implementation of the laws should be present to curb corrupt practices at all levels of implementation of the projects.

Technological Challenges

Need to find innovative ways so that advertisements and campaigns can be more effective. GPS can effectively monitor the behavior (speed of the vehicle) and deliver messages for road safety.

Rural and Urban Challenges

Usually more focus is kept on the national highways and urban roads. Rural areas are often neglected during the construction and maintenance of the roads.

Developing and developed nation challenges

Developing nations usually have a crunch of resources due to which effective maintenance of roads and vehicles may be an issue to be considered. Less police force may be available to implement the rules on the road to catch the violators

Global outreach Challenges

Usually funds are allocated depending upon the pull and push of the stakeholders and rarely uniform allocation is possible even by international agencies.

Continuous Research on this Subject

Sufficient funds should always be provided to analyze the various innovative methods that will be used in advertisements and campaigns to use the money effectively. Gaps in knowledge can be fulfilled by research which will be useful for the future.

Sustainable Development Challenges

Sustainable development is possible only if people have good health and they can be protected from manmade hazards. Road safety is one such question that is manmade and media can be very useful in attaining this target.

Improving Road Safety Behavior by Promoting risk Avoidance

tries to change the attitude of the drivers so that they drive safely thus reducing the number of accidents.

In 7th UN Global Safety Week was celebrated from May 15 to 21 with a theme of “Sustainable Transport” and a shift to walking, cycling and public transport and media will play an important role in creating awareness about this week.²⁸

There should always be ongoing surveys for behavioral changes to see the effectiveness of advertisements and road safety campaigns.²²

Threat appeals and humorous appeals causing fear in the masses can be a way to reduce the crashes on the roads e.g., possible injuries and deaths if not using helmets, seat belts, child restraints, following speed limits, respecting traffic lights and road signs. Such fear may improve driving behavior.

Children love cartoons and it will be a very good idea if the media can teach children the measures for road safety with the help of cartoon shows. Children will love to see it and children will have a permanent safety measure embedded in their brain and they will drive safely when the time comes for them to drive. They will also suggest to their relatives to adopt the safety measures and such relatives will be happy to listen to the children and their attitude towards safe driving will also change.

Preventions of accidents can be planned effectively by making plans for safer infrastructure, safer vehicles, quick and better emergency medical response, and better implementation of laws. There are some loopholes in the laws better laws can be made. It is important to make the public aware about all the reasons that cause accidents by using the budgets and media effectively.

CONCLUSION

Best practices for media usage need to be adopted. Road safety advertisements/media campaigns need to be carried out effectively. It is important to design the campaigns for the factors which are being violated most or people are not aware of it. Campaigns that have been seen effective in one country can be used as a toolkit for another country There is an actual need to plan for the future so that we can prevent injuries reduce the mortality due to vehicular crashes and attain the goals of the 2nd decade for road safety by effectively using the media and having better plans for the operative use of the media to prevent mortalities and morbidities due to road traffic accidents.

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The Knowledge, Practice, and Perception Regarding Corporal Punishment Among Teachers in Jaffna Educational Zone, Sri Lanka

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ABSTRACT

Objectives: Corporal punishment (CP), despite being considered an act punishable by law, is still practiced in homes and schools in Sri Lanka.

Methods: This descriptive cross-sectional institute-based study aimed to assess the knowledge, perception, and practice regarding CP among teachers in the Jaffna educational zone in Sri Lanka.

Results: The study involved 212 participants, out of which 160 (75.5%) were female. About 155 (73%) of the participants belonged to the age group of 31 to 50 years. About 114 (54.2%) participants had received training in disciplining students. About 7.5% had good knowledge, 33% had average knowledge, 24% had poor knowledge, and 35.4% had very poor knowledge regarding CP. In 28% (n = 59) were involved in CP. 58% (n = 123) had a negative perception of CP. The study found no significant correlation between socio-demographic factors such as age, gender, marital status, race, and religion and knowledge about CP.

Conclusion: This study demonstrated that the knowledge and practices on CP among this study population can further be improved. Larger-scale studies including participants of wider ethnic and geographical span would yield more data which might suggest the need for further inculcating knowledge on CP among teachers in Sri Lanka.

Keywords: Corporal punishment, School teachers, Knowledge, Perception, Practice.

Int J Eth Trauma Victimology (2023). DOI: 10.18099/ijetv.v9i02.02

INTRODUCTION

Interpersonal violence affects approximately 50% of children globally.¹ Exposure to violence can negatively impact their physical and psycho-social development.¹⁻³ As a teacher, ensuring student discipline is crucial. Positive discipline, corporal punishment (CP), and psychological aggression are the approaches employed to address misbehavior. However, CP and psychological aggression are negative methods of disciplining.⁴ A physical force intended to cause a child pain but not injury to correct or control their behavior is considered CP.⁵ The act of physically harming a child through punching, beating, kicking, biting, burning, shaking, or any other form of physical injury is known as physical abuse.⁶ Unfortunately, CP is still prevalent in homes and schools in Sri Lanka.⁶ It often takes the form of hitting with a hand or an instrument but can also include other methods like pinching, hair pulling, or making students kneel or stand for extended periods.⁷ Parental and school teachers' understanding of CP is decisive in determining its incidence in children. Similarly, it is important to recognize that there is a thin line separating CP from physical abuse. Some view these two as part of a continuum, and excessively or too severely administered CP is considered physical abuse.^{8,9}

The debate over the advantages and disadvantages of CP has been ongoing for several decades.⁸ There are varying opinions

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How to cite this article: Mayorathan U, Pranavan S, Moganalakshan M, Niroshini JSA, Jiffry AM, Sriluxayini M, Munasinghe BM. The Knowledge, Practice, and Perception Regarding Corporal Punishment Among Teachers in Jaffna Educational Zone, Sri Lanka. *Int J Eth Trauma Victimology*. 2023;9(2):6-10.

Source of support: Nil

Conflict of interest: None

Received: 12/09/2023;

Received in revised form: 22/12/2023;

Accepted: 27/12/2023;

Published: 20/01/2024;

regarding the effectiveness of the CP. Some suggest it may be useful in specific circumstances, while others believe it is ineffective or potentially harmful.¹⁰ It is important to understand that CP may be brought up in discussions of child abuse due to its significant negative impact on a child's well-being. Adverse developmental and behavioral damages are just a few of the harms of this type of punishment.¹¹ Many children's rights advocates consider it a form of physical abuse.¹² In an ideal world, a nurturing teacher-student relationship and positive disciplining would be sufficient to prevent student misbehavior. Regrettably, this is not the current state of affairs. Despite advocating for implementing positive disciplinary tactics,

there are still numerous cases where teachers resort to negative methods of discipline.⁷ This study will evaluate the knowledge, practice, and perception regarding CP among teachers in the Jaffna educational zone, Northern Province, Sri Lanka.

MATERIALS AND METHODS

A descriptive cross-sectional institute-based study was conducted in targeted schools in the Jaffna educational zone. The study period was from 3rd July to 20th October 2022, and the school teachers in the Jaffna academic zone were selected as the study population. The unwilling to participate were excluded. A simple, random, convenient sampling method was used as the sampling technique. A self-administered questionnaire was provided in Tamil and English languages. A pilot study was performed to validate the questionnaire. The investigator/co-investigators carried out data collection for one month from the time of receiving ethical approval. Data was collected from available teachers in the staff room without compromising their working hours. The statistical analysis was performed using IBM SPSS Statistics version 21.

RESULTS

In the study, 212 teachers participated, out of which 76% (n = 160) were females and 24% (n = 52) were males. Most participants (94%, n = 199) were Sri Lankan Tamil, while 6% (n = 13) were Muslim. Most of the participants followed Hinduism (76%, n = 161), while 18% (n = 38) followed Christianity, and 13% (n = 06) followed Islam. The study revealed that 88% (n = 186) of the participants were teachers who were doing classroom teaching, and 12% (n = 26) were teachers who were doing administrative work.

The age range of the participants was between 20 to 60 years. Of them, 73% (n = 155) were between 31 to 50 years. Regarding the level of education, 40% (n = 80) of the teachers had completed their postgraduate education, while only 0.5% (n = 01) had studied up to G.C.E O/L. More than half (54%, n = 114) of the participants had training in disciplining students. Table 1 shows the sociodemographic factors of the teachers.

According to the knowledge test (Table 3), only 7.5% (n = 16) of the participants had good knowledge (scored more than 70), while a significant portion of the respondents (35.4%, n = 75) had very poor knowledge (scored less than 35). The rest of the participants had average knowledge (33%, n = 70) and poor knowledge (24.1%, n = 51), respectively. Table 2 shows the participants' level of knowledge.

Regarding corporal punishment, most participants (72%, n = 153) were not practicing it; however, out of the 28% (n = 59) who adopted corporal punishment, 44% (n = 26) employed "hitting with a hand or stick" or "squeezing the ears" as a form of punishment. Only 3% (n = 02) of the participants used "making the student kneel or stand for a while" as a form of punishment, while 17% (n = 10) used "informing parents" as a form of punishment. 36% (n = 21) of the participants used more than one form of punishment in their practice. Methods of practice of CP are shown in Table 3.

Table 1: Socio-demographic factors of the participants

		Number (n)	Percentage (%)
Sex	Female	160	76
	Male	52	24
Age category	20–30	24	11
	31–40	76	36
	41–50	79	37
	51–60	33	16
Ethnic group	Sri Lankan Tamil	199	94
	Muslim	13	06
Religion	Hindu	161	76
	Christian	38	18
	Islam	13	06
Marital status	Married	193	91
	Single	13	06
	Divorced	2	01
	Separated	1	0.5
	Widow/Widower	3	1.5
Position at school	Vice Principal	3	1.5
	Deputy Principal	2	01
	Sectional Head	6	03
	Class Teacher	201	94.5
Educational level	O/L	1	0.5
	A/L	35	16.5
	Undergraduate degree	50	23
	Postgraduate degree	84	40
	College of Education	42	20

Table 2: Knowledge of the participants

	Number (n)	Percent (%)
Good knowledge (More than 70)	16	08
Average knowledge (50–70)	70	33
Poor knowledge (35–50)	51	24
Very poor knowledge (Less than 35)	75	35
Total	212	100

Table 3: Methods practiced by teachers to discipline the students

	Number (n)	Percent (%)
Not practice	153	72
Hitting with a hand or stick or squeezing the ears	26	12
Making the student kneel or stand for a period	2	01
Punishing <i>via</i> informing parents	10	05
More than one form of CP	21	10
Total	212	100

The participants had varying opinions on the necessity of CP on students. 40% (n = 85) agreed with the idea that "In certain situations, children deserve to be physically punished." In 65% (n = 138) believed that "parents and teachers should be strict with their children to control their behavior." In 60% (n = 127) stated,

Table 4: Describe the responses given by the teachers regarding the statements about CP

Questions	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
In certain conditions, children deserve to be beaten	6.1	34.4	22.6	27.8	9.0
To control child behaviors' parents and teachers should be strict with their children	27.4	37.7	16.5	11.3	7.1
Children should obey their parents and teachers	58.5	27.4	8.5	4.7	9.0
CP associates with psychological problems in children later in life rather than a favorable attitude towards such discipline	28.3	31.6	23.1	9.9	7.1
CP associated with good academic performance of children	4.2	18.9	21.7	37.3	17.9
CP should be prohibited at home and in the school environment	16.0	25.9	28.8	22.2	7.1
School teachers have the right to punish the child in case of any misbehavior	17.0	38.7	21.7	13.7	9.0

Table 5: Statistical analysis of knowledge vs. demographics, training on CP, practices of CP, and perception on CP of the participants

		Good	Average	Poor	Very poor	
Age Category	20–30	12.5	37.5	25	26	$\chi^2 = 5.364$
	31–40	7.9	34.2	17.1	40.8	df = 9
	41–50	6.3	31.6	29.1	32.9+	
	51–60	6	30.3	27.3	36.4	p = 0.802
Gender	Male	1.9	36.5	25	36.5	$\chi^2 = 3.198$
	Female	9.3	31.9	23.5	35	df = 3 p = 0.362
Marital status	Married	6.7	34.2	23.3	35.8	$\chi^2 = 6.360$
	Other	15.8	21.1	31.6	31.6	df = 3 p = 0.339
Training on disciplining students	Trained	5.2	33.9	24.3	36.5	$\chi^2 = 1.97$
	Not trained	10.3	32.0	23.7	34.0	df = 3 p = 0.579
Practicing CP	Yes	6.8	37.3	20.3	35.6	$\chi^2 = 0.986$
	No	7.8	31.4	25.5	35.3	df = 3 p = 0.805
Type of perception	Positive	6.7	34.4	24.4	34.4	$\chi^2 = 0.305$
	Negative	8.2	32.0	23.8	36.1	df = 3 p = 0.959

“Corporal punishment can lead to psychological problems in children later in life instead of promoting discipline.” In 86% (n = 182) agreed that “Children should obey their parents and teachers.” In 42% (n = 89) believed “Corporal punishment should be prohibited at home and school.” In 56% (n = 119) agreed that “School teachers have the right to punish a child in case of misbehavior.” Most participants (55%, n = 117) disagreed with the idea that “Corporal punishment leads to increased academic performance in children.” Overall, 42% (n = 89) of teachers had a positive perception of corporal punishment, while 58% (n = 123) had a negative perception. Table 4 reveals teachers’ perceptions of different statements.

After analyzing the data, we found that there is no significant correlation between socio-demographic factors such as age, gender, marital status, race, and religion, and knowledge about corporal punishment. However, individuals aged between 20 and 30 tended to have average or above-average knowledge about it. On the other hand, those aged 31 to

50 had a higher number of poor and very poor knowledge about the subject. Nonetheless, we found no significant difference in knowledge and training in disciplining students among the participants (Table 5).

DISCUSSION

This study is aimed to assess the knowledge, practice, and perception of school teachers regarding CP. Since all schools in the study area were taught in Tamil medium, there were no Sinhalese teachers in the study population.

According to a study by De Soya *et al.* in 2017., only 103 out of 459 (22.4%) of Sri Lankan teachers received training in disciplining students.⁷ In contrast, the present study found that 54.2% of participants received some form of training in disciplining the children. Due to increased awareness of CP, the Ministry of Education may have trained their teachers in recent years, which could be a reason for the above observation.



Our study revealed that most teachers' knowledge was average and poor (57%, n = 121). Only 8% (n = 16) of participants had good knowledge (>70), while a significant number of people (35%, n = 75) had very poor knowledge (Scored less than 35). No similar studies were found that assessed the knowledge of Sri Lankan teachers regarding CP. However, studies have been conducted in different parts of the globe on the knowledge of child maltreatment, abuse and reporting such cases. These studies have shown a significant lack of knowledge among teachers in these areas.¹³⁻¹⁵

Even though most teachers had an average knowledge of CP, most participants (72.2%, n=153) were not involved in any CP. Teachers who use corporal punishment may not provide accurate reports about it, as they may be inclined to portray themselves in a more positive light, resulting in a falsely lower prevalence rate of corporal punishment among teachers. In 2015, Portela and Pells published a study comparing corporal punishment frequency across countries that may share similar socioeconomic features, such as higher poverty rates. When compared with the findings of that study, the use of CP in our study (27.8%) was higher than in countries such as Peru (0.7%), Vietnam (0.1%), and Ethiopia (12%) but not as high as in India (34%).¹⁶ In the present study, 44.1% (n = 26) of teachers who were engaged in CP used "Hitting with a hand or stick or squeezing the ears" as a form of CP. The study by de Soyza *et al.* also revealed that "Hitting with a hand or stick or squeezing the ears" has the highest prevalence (42.4%) among the CP methods.⁷

Our study revealed that teachers had a more negative perception of corporal punishment (CP) than a positive perception. Interestingly, CP was prohibited by the ancient Sri Lankan kings, but the colonial rulers accepted and promoted it in schools.¹⁶ The ethnic conflict and unrest among communities from 1983 to 2009 also contributed to teachers' negative perceptions of CP.⁶ Those who have been victims of CP during their childhood or have witnessed colleagues practicing it are more likely to perceive it negatively.¹¹

In the present study, no significant association was found between training in CP and practicing CP. However, a study conducted in Uganda revealed that the increasing number of training programs reduces the incidence of CP in schools.¹⁷ A study conducted in Sri Lanka concluded that schools with well-informed teachers experience fewer incidents of CP.⁷ The same author conducted another study on parental knowledge of CP, which revealed that most parents have inadequate knowledge of the subject. Furthermore, many perceive CP as a useful and necessary disciplinary measure, and preventing it would be imposing Western ideas on Sri Lanka⁶

CONCLUSION AND RECOMMENDATIONS

Based on the study results, it was found that most participants had only average knowledge of CP, and a few were practicing it. Furthermore, the negative perceptions towards CP were higher than the positive ones. In light of these findings, it can be recommended that adequate information about CP should be integrated into the curriculum of universities, colleges of education, and teachers training colleges.

Establishing a clear definition of CP in Sri Lanka's legal system would prevent confusion and deception. All teachers should be informed of the negative repercussions of corporal punishment. Teachers who have used corporal punishment through an impartial inquiry must be held accountable for it legally and administratively.

Establishing a system that allows students and parents to report cases of corporal punishment is crucial. Schools must implement a zero-tolerance policy for any form of CP towards students. To achieve this goal, each school should form a committee consisting of the principal, teachers, students, and parents. This committee would organize regular activities to create an environment where CP towards students is discouraged. Additionally, educating the wider community through media programs is a necessity. Any media promoting CP towards children as acceptable should be circumvented. Further research on the knowledge and outcomes of CP could be conducted to provide more insight into this area.

AUTHOR CONTRIBUTIONS

U Mayorathan - Study concept, design, Statistical analysis, manuscript preparation; S Pranavan - manuscript preparation, critical analysis; Moganalakshan M. – Data collection; Niroshini JSA- Data collection; Jiffry AM - Data collection; Munasinghe BM – Manuscript preparation, critical analysis

ACKNOWLEDGMENT

The authors would like to acknowledge all the study participants.

DATA AVAILABILITY STATEMENT

All data generated or analyzed during this study are included in this published article

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Pattern of Limb Injuries in Road Traffic Accident in Medico-Legal Autopsy Cases Brought to Mortuary of FMT Dept, RIMS, Imphal

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ABSTRACT

The injuries caused by road traffic accidents (RTAs) become a major public health problem worldwide and a major cause of morbidity and mortality with temporary or permanent disability. This cross-sectional study was conducted to assess the pattern of limb injuries in road traffic accidents in medico-legal autopsy cases brought to the mortuary of the Department of Forensic Medicine and Toxicology of a Tertiary Care Teaching Institute in Imphal. The estimated sample size is around 210. Only male cases brought for autopsy were analyzed. All the cases of road traffic accidents with limb injuries with or without injury to other parts of the body and only upper or lower limb injuries were included in our study. Data entry was done using a Windows-based statistical package for social sciences [SPSS] version 21.0 (Armonk NY: IBM Corp). To establish an association between the categorical variables with the type of injuries, the C2-test is applied, and interpretation is made accordingly. All comparisons are two-sided and the *p-values* of < 0.05, < 0.01, and < 0.001 are taken as the cut-off values for significance, high significance, and very high significance, respectively. From our study, the highest number of victims were observed among the age of 31 to 40 years which accounted for 27.6%; and the lowest number of victims of about 1% was observed among the age group of 0 to 10 years. The maximum number of victims were due to two-wheeler accidents which accounted for 52.4% of which 76 (69.09%) fatalities were riders. A maximum of fatalities was due to injuries to vital organs associated with shock and hemorrhages which accounts for 92.85% of cases and 7.14% of fatalities were due to injuries to the limb associated with shock and hemorrhages. The relationship of the cause of death with the type of injuries, it was observed that the cause of death has a very highly significant association with the type of injuries as evidenced by $p < 0.001$. Road traffic accidents are preventable. Strict traffic laws and penalties have to be imposed to curb this ever-growing menace. The result of this study enables a healthcare provider to predict fracture and site of injury. Strict enforcement of road safety regulations and improving emergency medical services may prevent untimely deaths and disabilities caused by RTAs. Awareness campaigns concerning safety rules can be targeted at high-risk groups with an emphasis on the improvement of the roads.

Keywords: Road traffic accidents, Limb injuries, Patterns, Preventable.

Int J Eth Trauma Victimology (2023). DOI: 10.18099/ijetv.v9i02.03

INTRODUCTION

A road traffic accident can be defined as an event that occurs on a way or street open to public traffic; resulting in one or more persons being injured or killed, where at least one moving vehicle is involved.¹ In 2004, road traffic accidents ranked as the 9th leading cause of death worldwide and are expected to be 5th by 2030.² Worldwide about 3000 people die every day and 30,000 people are injured seriously in traffic accidents.³ The injuries caused by road traffic accidents (RTAs) become a major public health problem worldwide and a major cause of morbidity and mortality with a temporary or permanent disability. Fast urbanization, industrialization, population explosion and people migration in India have contributed to the tremendous rise in road transport in the last two decades.⁴ This contributed to an increasing level of road traffic, resulting in an increased probability of road accidents. RTAs involve forensic investigations that allow risk factors and causes of death to be examined. Forensics experts often assess if an RTA has induced disabilities and if so, they quantify the percentage of impairment.³

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How to cite this article: Haricharan A, Devi SE, Memchoubi Ph, Sofi FM, Frieny L. Pattern of Limb Injuries in Road Traffic Accident in Medico-Legal Autopsy Cases Brought to Mortuary of FMT Dept, RIMS, Imphal. *Int J Eth Trauma Victimology*. 2023;9(2):11-14.

Source of support: Nil

Conflict of interest: None

Received: 31/08/2023;

Received in revised form: 03/09/2023;

Accepted: 04/09/2023;

Published: 20/01/2024;

The most prevalent injury was fracture of bones, particularly the head and neck, and the lower limbs and then upper limbs followed closely while the least injured portion is the abdomen. The present work is designed to study the pattern of limb injuries to understand the circumstances and mechanism of causation of these injuries in road traffic accidents in Imphal, Manipur.

MATERIALS AND METHODS

The present work is a cross-sectional study. The study was conducted in the Department of Forensic Medicine and Toxicology of a Tertiary Health Care Center in North-East, India. The study population was road traffic accident death cases with limbs injury with or without injuries to another part of the body to the mortuary of Forensic Medicine and Toxicology Department, Regional Institutes of Medical Sciences, Imphal, for medico-legal autopsies were included in our study. The study duration is between September 2019 to August 2021. The estimated sample size is around 210. Only male cases brought for autopsy were analyzed. All the cases of road traffic accidents with limb injuries with or without injury to other parts of the body and only upper or lower limb injuries were included in our study. Unknown causes of death and decomposed bodies were excluded from our study. Data entry was done using a Windows-based statistical package for social sciences [SPSS] version 21.0 (Armonk NY: IBM Corp). All the categorical variables like age, sex, religion, etc and patterns of upper limb injuries and lower limb injuries viz., abrasion, laceration, fracture, contusion etc, considered were again described as the number of cases and percentages. To establish the association between the categorical variables with the type of injuries, a C2-test is applied, and interpretation is made accordingly. All comparisons are two-sided and the *cc p-values* of < 0.05, < 0.01, and < 0.001 are taken as the cut-off values for significance, highly significance and very highly significance, respectively.

RESULTS

A total of 210 cases of fatal road traffic accidents with limb injuries were studied during the study period in the mortuary of the Regional Institute of Medical Sciences from September 2019 to August 2021. From our study, the highest number of victims were observed among the age of 31 to 40 years which accounted for 27.6%; and the lowest number of victims of about 1% was observed among the age group of 0 to 10 years (Table 1). The maximum number of victims were due to two-wheeler accidents which accounted for 52.4% of which 76 (69.09%) fatalities were riders. Further, Pedestrian was observed to be the next major fatalities of road traffic accident cases which account for 28.5% and four-wheelers about 19.04% in the majority about 30 (75 %) fatalities were among drivers (Table 2). In most road traffic accident cases, about 76.1% survived for 1 to 24 hours before they succumbed to their injuries. Further, it is observed that 2 cases survived for more than 1 week but unfortunately, he succumbed to his injuries (Table 3). A maximum of fatalities were due to injuries to vital organs associated with shock and hemorrhages which accounts for 92.85% of cases and 7.14 % of fatalities were due to injuries to the limb associated with shock and hemorrhages (Table 4). The brief history which we obtained, has no significant association with the type of injuries, (*p-value* => 0.05). The findings reveal that brief history within the fracture, four-wheelers (9.4%) and two-wheelers (7.3%) are found the highest and lowest and within the abrasion, a

Table 1: Distribution of cases by age of road traffic accident decrease

Parameter	No. of cases (n = 210)	Percentage (%)
Age (years)		
0–10 yrs	2	1.00
>10–20 yrs	20	9.5
21–30 yrs	30	14.3
31–40 yrs	58	27.6
41–50 yrs	34	16.1
51–60 yrs	32	15.2
61–70 yrs	24	11.4
71–80 yrs	10	4.7

Table 2: Types of victims of road traffic accident

	No. of cases (n = 210)	Percentage (%)
I Two-wheeler	110	52.4
1. Rider	76	69.09
2. Pillion rider	34	30.90
II Four-wheeler	40	19.04
1. Driver	30	75.04
2. Occupant	10	25.00
III Pedestrian	60	28.5
Total	210	100

Table 3: Showing survival period of road traffic accident victims

Survival period	No. of cases	Percentage (%)
On the spot	30	14.28
Within 1 hour	16	7.6
1–24 hours	160	76.1
>1 week	2	1
Unknown	2	1
Total	210	100

Table 4: Showing cause of death of road traffic accident ceases

Cause of death	No. of cases	Percentage (%)
Injury to the limb with shock and hemorrhage	15	7.14
Injury to vital organs associated with Shock and hemorrhage	195	92.85
Total	210	100

pedestrian (44.4%) and two-wheeler (43.6%), the highest and the lowest; within the contusion, two-wheelers and pedestrian, the highest and the lowest; within laceration, no case of a pedestrian



Table 5: Type of injuries-wise distribution of road traffic accidents according to brief history

Parameters		Type of Injuries					χ^2 -value	df	p-value	
		Abrasion	Contusion	Laceration	Multiple injuries	Total				
fracture 16 (7.6%)		92 (43.8%)	34 (16.2%)	8 (3.8%)	60 (28.6%)	210 (100.0%)				
Brief history	Two wheeler	8 (7.3%)	48 (43.6%)	22 (20.0%)	4 (3.6%)	28 (25.5%)	110 (100.0%)	3.340	8	.911
	Pedestrian	2 (5.6%)	16 (44.4%)	4 (11.1%)	-	14 (38.9%)	36 (100.0%)			
	Four wheeler	6 (9.4%)	28 (43.8%)	8 (12.5%)	4 (6.2%)	18 (28.1%)	64 (100.0%)			

Table 6: Type of injuries-wise distribution of road traffic accidents according to cause of death

Parameters		Type of injuries					χ^2 -value	df	p-value	
		Abrasion	Contusion	Laceration	Multiple injuries	Total				
fracture 16 (7.6%)		92 (43.8%)	34 (16.2%)	8 (3.8%)	60 (28.6%)	210 (100.0%)				
Cause of death	injury to limb	8 (40.0%)	-	-	2 (10.0%)	10 (50.0%)	20 (100.0%)	32.595	8	<.001
	shock and hemorrhage	2 (1.9%)	58 (55.8%)	14 (13.5%)	-	30 (28.8%)	104 (100.0%)			
	injury to vital organs	6 (7.0%)	34 (39.5%)	20 (23.3%)	6 (7.0%)	20 (23.3%)	86 (100.0%)			

χ^2 -value; df: degree of freedom; p-value: probability due to chance factor

while four-wheeler the highest and two-wheelers the lowest. Within the case of multiple injuries, a pedestrian (38.9%) and two-wheeler (25.5%) are noticed as the highest and the lowest respectively (Table 5). The relationship of cause of death with the type of injuries, it was observed that cause of death has a very highly significant association with the type of injuries as evidenced by $p < 0.001$. Fractures were highly associated with injury to limbs (40.0%). Contusions were highly associated with injury to vital organs (23.3%). Lacerations were highly associated with injury to the limb (10.0%) (Table 6).

DISCUSSION

In this study, the victims chosen were males. The study conducted by Murarka *et al.*⁵ is also similar to our study. It shows that male has more road traffic accidents than that of his counterpart females. The predominance of males explained that males are more prone to lead a more active life, more exposed to traffic accidents and trauma, etc. The majority of the victims were in the age range of 31 to 40 years with the highest percentage (27.6%) and lowest incidence (1%) seen in the age range of 0 to 10 years which is similar to studies conducted by Chaurasia AK *et al.*⁶ The highest in the age group 31 to 40 years could be because this is the most active phase of life. In the case of the survival period, two cases did not know the period. 1% of the cases survived for more than 1-week followed by those who survived for 1 to 24 hours (76.1%). Our finding is similar to Chaurasia *et al.*⁷ where most of the victims (30%) died within 12 to 24 hours whereas a finding of Singh H *et al.*⁸ showed that 39.5% of deaths occurred within 1-hour which is different from our finding. In the case of vehicles involved, maximum cases were caused by two-wheeler accidents (52.4%) and next was the pedestrian (28.5%) followed by four-wheeler

(19.04%) which is similar to the findings of Bhuyan *et al.*,⁹ This could be due to fact that two-wheelers are the most commonly used means of transport in Manipur. In terms of the type of victims, drivers of four-wheelers (75.04%), were found to be of highest percentage, followed by riders of two-wheelers (69.09%), pillion riders (30.9%), and pedestrians (28.5%). This finding is similar to a study conducted by Mishra *et al.*¹⁰ This could be due to the casual attitude of two-wheeler riders to traffic rules. The type of victim has no significant association with the type of injuries, insignificant p -value > 0.05 . It is observed that among the individual injuries, abrasion in 92 cases (43.8%) is the most common. A laceration is the least which is seen in 8 cases (3.8%), while a fracture is seen in 16 cases (7.6%) and a contusion is seen in 34 (6.2%). This contrasts with the study by George AS *et al.*¹¹ where Pillion riders were injured more often in collisions between two and four-wheelers. Our findings are similar to a study by Jhakar *et al.*¹² and different from work done by Mishra *et al.*¹⁰ which found that common injuries were lacerations and fractures (30%). Regarding the cause of death, injury only to the limb was around 20 fatal cases and the cause of death due to shock and hemorrhage was 104 cases and injury to vital organs was around 86 cases. This is a significant finding as the p -value is < 0.001 . This finding is different from previous workers^{13,14} where limb injury alone has never been reported as the sole cause of death. This proves that even if the limb is involved in a vehicular accident, it could be fatal if there are multiple limb injuries or if there is a fracture involved. This finding has not been seen in studies done by previous workers. In this study, cases were taken that were brought to the Regional Institutes of Medical Sciences, so our finding may not be representative of all the fatal road traffic accidents with limb injuries happening in the state of Manipur.

CONCLUSION

Road traffic accidents occur when a vehicle collides with another vehicle, pedestrian, animal, road debris, or other stationary obstruction, such as a tree or utility pole, it is an accident that takes place on the road between two or more objects, one of which must be any kind of moving vehicle. From the present study, it is found that the maximum number of victims was due to two-wheeler accidents and it is observed that most of the fatalities occurred after reaching the Hospital, mostly due to a lack of prompt aid for the victim and less trauma center in Manipur. In our study, injury mostly seen on the victims is abrasion and a few cases of fracture. The cause of death is due to injury to major vessels involved in the fracture causing shock and hemorrhage. Road traffic accidents are preventable. Strict traffic laws and penalties have to be imposed to curb this ever-growing menace. Road traffic accident injuries constitute a major but neglected emerging public health problem. There is a need for legislation against alcohol consumption among motorcyclists during riding hours and enforcement of speed limits by the government to reduce RTA among motorcyclists. The result of this study enables a healthcare provider to predict fracture and site of injury. Strict enforcement of road safety regulations and improving emergency medical services may prevent untimely deaths and disabilities caused by RTAs. Awareness campaigns concerning safety rules can be targeted at high-risk groups with an emphasis on the improvement of the roads. The fact that the economically productive age group was mostly involved should prompt an urgent public policy response with special reference to education, engineering, environment, and emergency care of road accident victims.

ETHICAL CLEARANCE

Ethical approval from the Research Ethical Board (REB), Regional Institute of Medical Sciences (RIMS), Imphal, was obtained. Informed written consent was obtained from the deceased party. Code was used during the collection of data to maintain confidentiality. The data obtained was kept in the Department of Forensic Medicine, RIMS, Imphal. Access to the data will be restricted to the investigator and the guides. The study was self-sponsored and there was no conflict of interest.

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Knowledge and Attitude of Nursing Faculty on Integrating Forensic Nursing into the Undergraduate Nursing Curriculum in Selected Nursing Colleges, Durgapur, WB: A Descriptive Study

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ABSTRACT

The advancement of forensic nursing in the last decade has developed a new and better image of the nursing profession and provided services to living and dead people. This discipline provides a new perspective on the approach of holistic care for patients at hospitals or community centers involved in legal issues. Today, applying legal sciences in nursing has formed wider roles in clinical research related to crime and legal processes to promote public health and safety. This study aims to assess the knowledge and attitude of nursing Faculty on Integrating Forensic Nursing into the Undergraduate Nursing Curriculum. A descriptive research design was used with a convenience sample of 100 nursing faculties from various Nursing Colleges in Durgapur. Among the 100 nursing faculties included in this study, the majority (65%) had a moderate level of knowledge, 18% had adequate knowledge and 17% had inadequate knowledge about integrating forensic nursing into the undergraduate nursing curriculum. Attitudes of nursing faculty towards integrating forensic nursing into the nursing curriculum depict that 94% of participants are neutral and 6% have negative attitudes but none of them have positive attitudes. The education background as well as service background were associated ($p < 0.05$) with the level of knowledge of nursing faculty. The study reveals that the integration of forensic nursing into to nursing curriculum can be well implemented for the betterment of the nursing curriculum as a subspecialty which can provide a wider scope in the nursing profession.

Keywords: Knowledge, Attitude, Nursing faculty, Forensic nursing, Nursing curriculum.

Int J Eth Trauma Victimology (2023). DOI: 10.18099/ijetv.v9i02.04

INTRODUCTION

Nursing is a healthcare profession that focuses on the care of individuals and their families to help them recover from illness and maintain optimal health and quality of life nurses are distinct from other healthcare providers as they have a wide scope of practice and approach to medical care.¹ Today, nursing has changed from a passive state to an independent, decision-maker profession. Nurses should increase their knowledge to meet the multiple needs of their patients because their duties are different from the past. To play advanced nursing roles, in addition to professional concepts, nurses should be familiar with legal concepts not only to provide quality care in multidisciplinary teams but also to defend their rights in appropriate situations.²

Forensic nursing is a specialty in the nursing discipline, which brings the concepts as well as principles of both law and nursing sciences together. This creative and evolving specialty seeks to meet the needs of the healthcare system with legal problems. The advancement of forensic nursing in the last decade has developed a new and better image of the nursing profession and provided services to living and dead people.³ This discipline provides a new perspective on the approach of holistic care for patients at hospitals or community centers involved in legal issues. Today, applying legal sciences in nursing has formed wider roles in clinical research related to crime and legal processes to promote public health and safety.⁴

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How to cite this article: Mathew TA, Xavier B, Jeyadeepa R. Knowledge and Attitude of Nursing Faculty on Integrating Forensic Nursing into the Undergraduate Nursing Curriculum in Selected Nursing Colleges, Durgapur, WB: A Descriptive study. *Int J Eth Trauma Victimology*. 2023;9(2):15-23.

Source of support: Nil

Conflict of interest: None

Received: 14/12/2023;

Received in revised form: 20/12/2023;

Accepted: 24/12/2023;

Published: 20/01/2024;

In the health care system, nurses often meet clients, families, and populations victimized by accidental or deliberate injuries, exploitation or ill-treatment but are not prepared to deal with them.²

A study was conducted at A.P. (Padmakumari, 2022) to assess knowledge and practice on forensic cases among emergency staff. In this study knowledge level of staff nurses was 53.3% had inadequate knowledge, 46.6% had moderate knowledge and none of the staff nurses had adequate knowledge of forensic nursing and they had educational needs that are related to forensic nursing.⁵

A study was conducted at In Hafar AI-Batin University to assess nursing students' knowledge regarding forensic nursing (2023). This study shows that 29.1% of nursing students had

good knowledge of forensic nursing, 13.3% had moderate knowledge and 57.6% had poor knowledge.⁵

The scope of education is also increasing to meet the changing demands of the people in society.⁶ Nursing education plays a vital role in preparing nurses for the well-being of people in various areas. As nursing is expanding its role day by day similarly forensic nursing is also a new trend in nursing. Therefore, all nursing students and nurse educators should be aware of forensic nursing as their sub-specialties and need.³

Need for the Study

Forensic nurses have a key role in providing comprehensive care to victims of violence and their family members. Nurses employed in the emergency hospital care setting possess certain skills related to forensic science such as evidence collection and preservation. However, nurses must possess additional skills to deliver comprehensive and holistic care to be recognized as forensic nurses. These fundamental skills include forensic interviewing examination skills, and evidence preservation.⁴

The proper preservation of evidence is required in all cases where evidence is collected. Therefore, preserving the chain of evidence is important in forensic nursing practice. The initial step for evidence preservation is to observe and record the nature and source of injuries. The nature of trauma might be physical sexual or emotional which might have resulted from the accident, assault, violence, drug abuse, etc.⁴

A study was conducted in Mumbai (2022) to assess the knowledge regarding forensic nursing among undergraduate nursing students. This study shows that the majority of students (64.17%) have average knowledge regarding forensic nursing even though 98.50% didn't have any previous training in forensic nursing.⁸

So, considering this matter the World Health Organization (WHO) and the International Association of Forensic Nurses (IAFN) have stipulated that legal content and concepts should be taught to undergraduate students as well as nursing alumni.²

A study was conducted in Turkey (Emine Tuğba Topçu, 2018) to determine the opinion of senior students about forensic nursing. In this results revealed that 94.7% of students believed that both forensic nursing should be an area of specialization and that nurses should receive forensic nursing education, 42.1% of them stated that this education should be given as an elective course in school, and 40% of the students stated that they wanted to become a forensic nurse when they graduated. The findings suggest that senior nursing students' knowledge of forensic nursing was insufficient and that they were untrained in this area.⁹

Therefore, the addition of courses related to forensic nursing to the undergraduate curriculum in all universities, opening postgraduate training programs related to the subject, and increasing scientific activities such as conferences, seminars, and courses are recommended.

Forensic nursing is an emerging sub-specialty in India holding the potential to rejuvenate the medico-legal system of

the country. Also, in India, with its rampant increase in crime rates, the greatest promise of forensic nursing is the emergence of a new holistic approach to legal issues surrounding patient care in the hospital and community setting.

The Indian Nursing Council has introduced forensic nursing as a subject in the graduate nursing program in the year 2021. The inclusion of forensic nursing as a subject in the nursing curricula introduces the students to a wider role in contemporary nursing practice that contributes to our own and public health safety.⁷ The implementation of graduate and postgraduate programs in forensic nursing further reduces the gap between health care systems and judiciary systems. The knowledge and practice-related realms of forensic nursing are still in the infancy stage among nursing aspirants in India.⁴

Doing so will enable nurse educators to prepare students who can help break the cycle of violence and close the gap that exists in health care delivery for individuals affected by violence.

To overcome all these problems, we suggest that forensic nursing should be introduced all over India and forensic nurses can help in various ways for the successful prosecution of cases.¹⁰

OBJECTIVES

- To assess the knowledge of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum.
- To assess the attitude of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum.
- To find an association between the knowledge and attitude of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum with selected socio-demographic variables.

MATERIALS AND METHODS

Research Approach

A Quantitative approach was considered for the present study.

Study Design

A descriptive research design is used to assess the knowledge and attitude of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum.

Population

In the present study, it consists of nursing faculty from selected nursing colleges, in Durgapur.

Sample

In this study, the sample consists of 100 nursing faculty who are working from selected nursing colleges in Durgapur.

Sampling Technique

In this study, the sampling technique was used convenient sampling technique.



The Setting of the Study

Selected nursing colleges in Durgapur

Inclusion Criteria

- Faculty who are currently working in selected colleges of nursing, Durgapur.
- Faculty who are willing to participate in the study.
- Faculty who are available at the time of data collection.

Exclusion Criteria

- Faculty who have been exposed to any training program related to forensic nursing in the past.

Ethical Clearance

The institutional ethical committee of IQ City Medical College approved this project before the beginning of the study to consider ethical principles. The participants were assured of the confidentiality of the data.

Description of the Data Collection Tool

To assess the knowledge and attitude of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum. A structured questionnaire is developed by the investigator.

The data collection tool has been divided into 3 sections.

Section A

A structured questionnaire is used to collect the socio-demographic data. It included age, gender, experience, qualification, etc.

Section B

It consists of 25 multiple-choice questions to assess the knowledge regarding forensic nursing. It depicted the distribution of items according to the area under the main domains: general information on forensic nursing (5 items), concept of forensic nursing (5 items), history and development (4 items), scope of forensic nursing (6 items), qualities of forensic nurse (3 items), role and functions of forensic nurse (2 items). Each items have four options, score 1 for each correct answer and zero scores for each wrong answer.

The scoring of knowledge regarding forensic nursing is shown in Table 1.

Section C

It included 15 attitude questions to assess the attitude of nursing faculty on integrating forensic nursing into the undergraduate curriculum. Each attitude questionnaire was rated using a

Table 1: Scoring of knowledge regarding forensic nursing

Range	Level of knowledge
1-8	Inadequate
9-16	Moderate
17-25	Adequate

5-point Likert rating scale strongly agree, agree, neutral, disagree, and strongly disagree. Score 5 for strongly agree and score 1 for strongly disagree. The total score was 75 converted to percentage. The attitude was graded as positive (75%), neutral (50–75%), and negative (< 50%). Nursing faculty with a < 50% attitude score was described as having a negative attitude, between 50 and 75% score were considered to have a neutral attitude, and > 75% score was considered to have a positive attitude regarding forensic nursing.

Data Collection Method

Formal administrative permission was obtained from Head of the Institutions of selected nursing colleges to collect the data. The data was collected from October 1st to October 15th 2023. All nursing faculty who fulfilled the inclusion criteria were invited through WhatsApp and mail to participate in the study. A total of 100 nursing faculty participated in the present study. A structured online self-administered knowledge, and attitude questionnaire was developed using web-based Google forms with attached information sheets and instructions. Before the data collection the purpose of the study was explained to the participants, confidentiality was assured to all the subjects and informed consent was obtained. The average time taken to answer the questionnaire ranged from 30 to 35 minutes. The master sheet was prepared for the data obtained from the samples.

Table 2: Socio-demographic characteristics of participants

(n = 100)	Percentage
Age (Years)	
< 30	55
30–40	27
> 40	18
Gender	
Male	8
Female	92
Marital status	
Single	59
Married	41
Education background	
B.Sc Nursing	46
M.Sc Nursing	51
M. Phil	3
Service background (Years)	
< 1	49
1–4	37
5–8	8
> 9	6
Organization position	
Clinical Instructor	46
Tutor	35
Assistant professor	10
Associate professor	7
Professor	2
Source of information regarding forensic nursing	
Seminar	24
Workshop	76

Plan of Data Analysis

The collected data were summarized by using descriptive statistics: frequency, percentage; mean and SD. The Pearson correlation coefficient ("r") was used to find the relation between knowledge and attitude of nursing faculty. The likelihood ratio or Chi-square test was used to find the association between the knowledge, and attitude of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum and selected socio-demographic variables. The *p-value* < 0.05 was considered as significant. Data were analyzed by using the SPSS software.

Analysis and Interpretation

- The majority of the participants were female (92%) and under 30 years of age (55%). The highest percentage of participants had a background in M.Sc Nursing (51%) and worked as a clinical instructor (46%). The majority 76% of the participants received information regarding forensic nursing from various workshops.
- The knowledge level of nursing faculty was majority 65% have moderate knowledge, 17% have inadequate knowledge, and 18% have adequate knowledge of forensic nursing.
- Attitudes of nursing faculty toward integrating forensic nursing into the nursing curriculum depict that 94% have neutral and 6% have negative attitudes but none of them have positive attitudes.
- There was no relation between the knowledge and attitude of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum
- There was a significant association between between knowledge of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum with selected socio-demographic variables of educational background as well as service background.
- There was no association between the attitude of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum with selected socio-demographic variables.

Table 3: Items-wise analysis of knowledge regarding forensic nursing

(n = 100)		Correct answer (%)	Wrong answer (%)
General information	The application of scientific, technical or other specialized knowledge to assist courts in resolving questions of fact in civil and criminal trials is a forensic science	55	45
	Forensic science is also known as	55	45
	Scientific methods used to investigate crime are	45	55
	The latest branch of forensic science is	43	57
	In India, the development of the fetal stage is	63	37
Concept	Forensic nursing means	60	40
	Forensic nursing is the application of	44	56
	The most important use of forensic nursing is to	44	56
	Cases where forensic nursing can be used are	43	57
	Forensic nurses are	47	53
History	The title of forensic nurse originated in the year of	46	54
	Founder of forensic nursing	46	54
	First forensic nurse	54	46
	Forensic nursing was officially accepted as a specialty by	54	46
	Forensic nurse can work in	48	52
Scope	Subspecialties of forensic nursing	44	56
	The first health care professional to deal with a victim of violence or abuse in a health care setting	41	59
	Forensic nurses should collect the following types of evidence from the victim	39	61
	Educational options for forensic Nurse	49	51
	Scope of a forensic nurse after master degree	49	51
Qualities	Forensic nurses should have skills in	45	55
	Forensic nurses should be	56	44
	Forensic nurses should have specialized knowledge of except	50	50
Role and functions of forensic nurse	The duties of forensic nurses are	63	37
	Forensic nurses play an integral role in	56	44



RESULTS

The results have been organized and presented in 5 section

Section A

Data on socio-demographic

Table 2 shows the socio-demographic characteristics of participants. The majority of the participants were female (92%) and under 30 years of age (55%). The highest percentage of participants had a background in M.Sc Nursing (51%). Most of the participants (76%) received information regarding forensic nursing from various workshops.

Table 4: Knowledge level of nursing faculty

Knowledge	Percentage (%)
Inadequate (1-8)	17
Moderate (9-16)	65
Adequate (17-25)	18

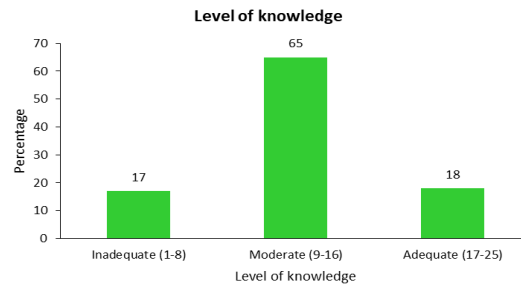


Figure 1: The bar graph represents the level of knowledge of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum

Section B

As shown in Figure 1, the knowledge level of nursing faculty were majority 65% have moderate knowledge, 17% have inadequate knowledge, and 18% have adequate knowledge of forensic nursing.

Table 5: Items-wise analysis of the attitude of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum

N = 100

	Strongly agree (%)	Agree (%)	Not sure (%)	Disagree (%)	Strongly disagree (%)
Forensic nursing education is designed to help students know the importance of forensic science in total patient care	4	17	25	32	22
Forensic nursing education as an emerging speciality in health care and nursing practice	18	38	25	15	4
Forensic nursing as a specialty discipline in professional nursing practice	8	29	37	21	5
Forensic nursing education understanding the nature of forensic sciences and issues concerning violence	8	33	32	20	7
Forensic nursing education can give more scope of practice for forensic nurse	8	13	25	31	23
Studying forensic nursing education able to identify forensic team	4	23	33	32	8
In forensic education, students can understand the roles and responsibilities of forensic nurses in the total care of victims of violence	10	25	40	21	4
Forensic nursing education can get skills in the preservation of evidence of victims	9	12	39	35	5
Forensic nursing education develops a basic understanding of the Indian judicial system and legal procedure	5	16	50	27	2
Forensic education can help the student to describe fundamental rights and the human rights commission	3	24	38	33	2
Forensic education helps the students to understand the basic Indian Judicial system and laws	3	13	37	46	1
Forensic nursing education helps students while working in hospitals and community	10	22	40	26	2
Students who have emotional stability, and skills in communication, documentation and observation can go for a specialization in forensic nursing	10	27	40	22	1
Forensic nursing education is necessary for day-to-day nursing work	12	33	40	11	4
Do you think that participating only in workshops, seminar and conferences has a major role in improving skills and knowledge in forensic nursing	6	32	49	10	3

Assessment of knowledge of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum

Table 3 shows that out of the 25 items of knowledge questions regarding the meaning of forensic nursing, the role, scope and functions of forensic nurses, participants achieved the maximum score. Most of the participants could correct the question related to the history and development of forensic nursing.

Table 4 shows that among the 100 nursing faculties included in this study, the majority (65%) had a moderate level of knowledge, 18% had adequate knowledge and 17% had inadequate knowledge about integrating forensic nursing into the undergraduate nursing curriculum.

Section C

Assessment of the attitude of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum

Table 5 shows the majority of respondents agree that forensic nursing education is important in understanding the nature of forensic sciences and issues concerning violence. Specifically, 25% of respondents are not sure about the importance of forensic nursing education in knowing the importance of forensic science in total patient care, while 32% of respondents disagree with this statement. Additionally, a significant number of respondents agree that forensic nursing education can give more scope of practice for forensic nurses and that it is necessary for day-to-day nursing work. Specifically, 40% of respondents agree that forensic nursing education is necessary for day-to-day nursing work. Specifically, 49% of respondents are not sure if participating only in workshops, seminars, and conferences has a major role in improving skills and knowledge in forensic nursing. Overall, forensic nursing education is an important and necessary field of study that can help nurses provide better care for victims of violence and abuse.

As shown Table 6 among the 100 nursing faculty majority (94%) had neutral attitude and 6% had negative attitude regarding integrating forensic nursing in to the undergraduate nursing curriculum.

Table 7 shows that the total score of knowledge ranged from 4 to 9 with a mean of 12.38 ± 3.44 and the attitude score ranged from 33 to 56 with a mean of 45.27 ± 4.48 . The Attitude (% of the score) ranged from 44 to 74.7 with a mean of 60.36 ± 5.97 .

A shown, Figure 2 attitudes of nursing faculty towards integrating forensic nursing into the nursing curriculum depict that 94% have neutral and 6% are negative attitude but none of them have positive attitudes.

Table 6: Level of attitude

Attitude	Percentage
Negative (< 50%)	6
Neutral (50–75%)	94

N = 100

Section D

Relation between knowledge and attitude of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum

The Pearson correlation coefficient (“r”) was used to find the relation between knowledge and attitude of nursing faculty. There was no correlation ($p > 0.05$) between the knowledge and attitude of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum.

Table 7: Total score for knowledge and attitude

Total score	Range	Mean	S.D.
Knowledge	4–19	12.38	3.44
Attitude	33–56	45.27	4.48
Attitude (% of the score)	44–74.7	60.36	5.97

Table 8: Relation between knowledge and attitude of nursing faculty

	Mean	S.D.	“r”	p-value
Knowledge	12.38	3.44	-0.033	0.745
Attitude	45.27	4.48		

(“r” = Pearson correlation coefficient)

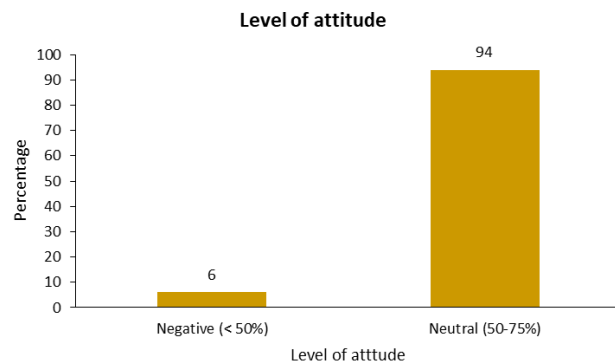


Figure 2: The bar diagram shows the attitude of nursing faculty toward integrating forensic nursing into the undergraduate nursing curriculum

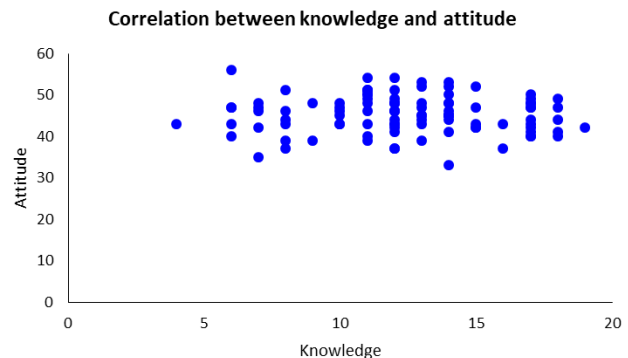


Figure 3: Correlation between knowledge and attitude



Table 9: Association between knowledge of nursing faculty with selected socio-demographic variables

	Knowledge						Likelihood ratio/Chi square#	Df	p-value	
	Inadequate (1-8)		Moderate (9-16)		Adequate (17-25)					
	n	%	n	%	n	%				
Age (Years)	< 30	7	41.2	36	55.4	12	66.7	4.43	4	0.350
	30-40	6	35.3	19	29.2	2	11.1			
	> 40	4	23.5	10	15.4	4	22.2			
Gender	Male	1	5.9	7	10.8	0	0	3.73	2	0.155
	Female	16	94.1	58	89.2	18	100			
Marital status	Single	9	52.9	38	58.5	12	66.7	0.70	2	0.704
	Married	8	47.1	27	41.5	6	33.3			
Education background	B.Sc nursing	12	70.6	31	47.7	3	16.7	11.81	4	0.019*
	M.Sc nursing	5	29.4	32	49.2	14	77.8			
	M. Phil	0	0	2	3.1	1	5.6			
Service background	< 1 year	6	35.3	33	50.8	10	55.6	16.58	6	0.011*
	1-4 years	7	41.2	22	33.8	8	44.4			
	5-8 years	0	0	8	12.3	0	0			
	> 9 years	4	23.5	2	3.1	0	0			
Organization position	Clinical instructor	6	35.3	31	47.7	9	50.0	14.64	8	0.067
	Tutor	6	35.3	21	32.3	8	44.4			
	Assistant professor	1	5.9	9	13.8	0	0			
	Associate professor	4	23.5	3	4.6	0	0			
Source of information regarding forensic nursing	Professor	0	0	1	1.5	1	5.6	0.32	2	0.851
	Seminar	5	29.4	15	23.1	4	22.2			
	Workshop	12	70.6	50	76.9	14	77.8			

(* Significant)

Table 10: Association between the attitude of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum and selected socio-demographic variables

	Attitude				Likelihood ratio	Df	p-value	
	Negative (< 50%)		Neutral (50-75%)					
	n	%	n	%				
Age (Years)	< 30	4	66.7	51	54.3	2.47	2	0.292
	30-40	2	33.3	25	26.6			
	> 40	0	0	18	19.1			
Gender	Male	1	16.7	7	7.4	0.52	1	0.471
	Female	5	83.3	87	92.6			
Marital status	Single	3	50.0	56	59.6	0.21	1	0.646
	Married	3	50.0	38	40.4			
Education background	B.Sc nursing	4	66.7	42	44.7	1.34	2	0.512
	M.Sc nursing	2	33.3	49	52.1			
	M. Phil	0	0	3	3.2			
Service background	< 1 year	3	50.0	46	48.9	1.85	3	0.603
	1-4 years	2	33.3	35	37.2			
	5-8 years	0	0	8	8.5			
	> 9 years	1	16.7	5	5.3			
Organization position	Clinical instructor	3	50.0	43	45.7	2.14	4	0.710
	Tutor	2	33.3	33	35.1			
	Assistant professor	0	0	10	10.6			
	Associate professor	1	16.7	6	6.4			
Source of information regarding forensic nursing	Professor	0	0	2	2.1	0.28	1	0.594
	Seminar	2	33.3	22	23.4			
	Workshop	4	66.7	72	76.6			

As shown, Table 8 there was no correlation ($p > 0.05$) between knowledge and attitude of nursing faculty on integrating forensic nursing in to the undergraduate nursing curriculum.

Figure 3 shows the relation between the knowledge and attitude of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum.

Section E

Association between knowledge of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum and selected socio-demographic variables

The Likelihood ratio or Chi-square test was used to find the association between the knowledge of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum and selected socio-demographic variables. The education background as well as service background were associated ($p < 0.05$) with the level of knowledge of nursing faculty.

As shown, Table 9 the association between knowledge of nursing faculty with selected socio-demographic variables.

The likelihood ratio test was used to find the association between the attitudes of nursing faculty on integrating forensic nursing into the undergraduate nursing curriculum and selected socio-demographic variables. The attitude was not associated ($p > 0.05$) with the socio-demographic characteristics.

As shown, Table 10 the attitude of nursing faculty on integrating forensic nursing in to the undergraduate nursing curriculum not associated with ($p > 0.05$) with sociodemographic variables.

DISCUSSION

The major findings show that the majority (65%) of nursing faculty have moderate knowledge, 18% have adequate and 17% have inadequate knowledge on forensic nursing. A similar study was conducted at A.P. (Padmakumari, 2022) to assess knowledge and practice on forensic cases among emergency staff. In this study knowledge level of staff nurses was 53.3% had inadequate knowledge, 46.6% had moderate knowledge and none of the staff nurses had adequate knowledge of forensic nursing and they have educational needs that are related to forensic nursing.⁵

Attitudes of nursing faculty towards integrating forensic Nursing into the nursing curriculum depict that none of the participants had positive attitudes, 94% are neutral and 6% have negative attitudes. A similar study conducted by Topicu and Kazan 2018 about the opinion of senior nursing students on forensic nursing, revealed that 94.7% of students believed that both forensic nursing should be an area of specialization and that nurses should receive forensic nursing education, 42.1% of them stated that this education should be given as an elective course in school, and 40% of the students stated that they wanted to become a forensic nurse when they graduated.⁹

CONCLUSION

This study finding helps nurse educators to update their knowledge and use the tool to guide student nurses. The

nursing students and clinical instructors should have updated knowledge regarding the need for forensic nursing to preserve the evidence and help the victims get justice.

Nursing Implication

Nursing education

- As nursing is expanding its role day by day similarly forensic nursing is also a new trend in nursing. Therefore, all nursing students and nurse educators should be aware of forensic nursing as their sub-specialties and needs.

Nursing practice

- Understanding the process of evidence collection and its preservation is one of the most important aspects of the forensic nurse.
- The nurse's practice can plan for an in-service program and guide the team in preparing the health education material.

Nursing research

Researchers in forensic nursing will provide new knowledge regarding it, as the technological and thinking level is going on changing.

Limitation

- This study was limited to a descriptive approach.
- This study was restricted to be performed only in a selected nursing college.
- A structured questionnaire constructed by the investigator was used to collect information on forensic nursing which was of restrictive responses

Recommendations For Further Studies

Based on the findings of the study, the following recommendations are made

- A similar study can be conducted with a large sample.
- A study can be conducted to assess the knowledge and attitude of staff nurses regarding the need for forensic nursing.
- Nursing faculty need to attend seminars, conferences, and workshops to update their knowledge.

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Probability of Gender Identification through Handwriting Analysis

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ABSTRACT

Handwriting is a unique identity of every individual which can neither be copied nor be recreated. Examination of handwriting has always been of great utility in forensic science not only as a source of physical evidence in criminal investigation but as a tool for personal identification. An attempt was made to examine and analyze certain handwriting characteristics such as pen pressure, slant of words, size of letters, completeness of letters, spacing between lines and placement of diacritics to determine the gender of the individual. About 70 samples, 35 each male and female with their consent, were collected from the students of various departments in a survey conducted at Annai Fathima College of Arts and Science, Thirumangalam. The participants were asked to fill out a survey paper using a DOMS GL 0.6 pen. The samples were analyzed and compared properly in consideration of the characteristics. From this study, it was concluded that the determination of gender from handwriting characteristics like pen pressure, slant of words, completeness of letters and placement of diacritics is possible as they show a great difference in their percentage of similarity in male and female individuals whereas the size of letters shows a slight difference in their percentage and hence cannot be used as a parameter for gender determination.

Keywords: Handwriting, Gender determination, Parameter.

Int J Eth Trauma Victimology (2023). DOI: 10.18099/ijetv.v9i02.05

INTRODUCTION

Handwriting/penmanship is a complex motor skill involving the interplay of sensory, neurological and physiological impulses. It results due to factors like visual, knowledge or skill, pathways of central nervous system (CNS) anatomy and physiology of bones and muscles of the arm.¹

It is an acquired capacity and each person has their unique style of handwriting, whether it is everyday handwriting or their signature. Even identical twins who share appearance and genetics do not have the same handwriting.² The place where one grows up and the first language one learns melt together with the different distribution of force and ways of shaping words to create a unique style of handwriting for each person. Because each person's handwriting is unique and different, it can be used to verify a document writer.

The hand is an extremely complex and delicate mechanism, containing some 27 bones controlled by more than 40 muscles. Most of the muscles are situated in the lower arm and connected to the fingers by an intricate set of tendons. Their ability to manipulate a writing instrument is precisely coordinated by a timing system under neutral control of the movement of the arm, the hand and the fingers. The precise ordering and timing of the movements determines the structure of the pattern that is recorded by the writing instrument.

Handwriting could be called mind-writing because it reveals the personality, emotions, likes and dislikes, strengths and weaknesses, intellect and much more about an individual.^{3,4}

The teaching of handwriting has been an important feature in the curriculum in both England and the United States since the inception of schooling. Children are usually taught first to form letters in a printed fashion before progressing to cursive

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How to cite this article: Ajith A, Anilraj A, Vijay DC, Jayan KG, Chakraborty P. Probability of Gender Identification through Handwriting Analysis. *Int J Eth Trauma Victimology*. 2023;9(2):25-28.

Source of support: Nil

Conflict of interest: None

Received: 10/09/2023;

Received in revised form: 10/12/2023;

Accepted: 12/12/2023;

Published: 20/01/2024;

or 'joined-up' writing at about the age of eight. There is an expectation that by the start of secondary schooling, children will have adopted a fluid joined-up writing script which often already shows some markers of individuality.^{3,4}

Characteristics of Handwriting

The handwriting of an individual is as unique as the fingerprint.

Pen pressure

Pen pressure may be defined as the force or pressure applied on the writing instrument during the writing operation.⁵

Pen pressure can be classified into the following main classes:

- Light pen pressure
- Heavy pen pressure
- Medium pen pressure
- Graduated pen pressure

Size of letters

The size of the letters measures the height and width of capital and lowercase. Also, through the study of dimension, we

analyze the existing relationship between capital letters and lowercase, the length of upper extensions and lower extensions, and the proportion of all the strokes.⁶ The inferiority complex is discovered compensated in the size of capital letters.

Size consistency

It is the ratio of height: to width of the letter formed while writing them. It can be big, small, or intermediate. A forger can never copy size consistency. If they try to do so, we can see tremors in the strokes.

Slant of words

It is the direction of letters while writing. The slant of the letters can be to the right, to the left, straight, or mixed slant.

Spacing between words and letters

The spacing between the letters and words, i.e., intra-letter and intra-word spacing, can be consistent or inconsistent.

Spacing between lines

The amount of space that the writer leaves between the lines on the page gives clues to the orderliness and clarity of his thinking, and to the amount of interaction that he wishes to have with his environment. Normal spacing has its harmony and flexibility.

Line quality

It shows the overall appearance of handwriting. We can examine this through-line flow (the strokes formation, freely written writing, the usual handwriting habit), shakiness (presence or absence of tremors), and irregularities (written regularly or not). It indicates the writing speed, copied, prolonged or altered writing.

Page margin

The page is space, and the way that the individual fills his page with script shows mental stability. The left side of the paper represents the past from which the writer starts, and the right side symbolizes goals and the future. Placement on the page also shows the quality of the person's taste, social, cultural, and artistic tendencies, or a lack of these. Unconscious feelings toward space and its use give clues to the person's self-esteem and how it will relate to others.

Pen lifts

It is the lifts of the writing instrument while writing on paper. A forged document contains unusual pen lifts, i.e., pen lifts at an unexpected place.

Size and shape of diacritics

The minute and prominent habits of writing letters. The dot positions on the letter "i" or the crossbar position on the letter "t".

Initial and terminal strokes

Initial Strokes – Initial strokes are found at the beginning of letters and words. They may be straight, curved or hooked, long or short strokes.

Terminal Strokes – Terminal strokes are ending strokes on letters and words. They also may be straight, curved, or hooked, long or short and are consistent with writers. These are also overlooked by forgers unless the terminal stroke is very distinctive.⁷

Embellishment

The fancy curls, loops, or any unusual letter formations either at the initial strokes or at the terminal's ones.

Connecting strokes

The strokes are present between the letters to join them. It might be present or absent depending upon the individual's writing.⁷

Significance in forensic science

- Examination of handwriting has always been of great utility in forensic science not only as a source of physical evidence in a criminal investigation but also for evolving new techniques and ideas related to the purpose of personal identification if it becomes possible to predict the gender of the writer so that the innocent could be protected and thus aid in the investigation process.⁸
- Handwriting analysis can depict a lot about personality.
- Large companies use graphology to check job applications.
- The police still use handwriting experts to determine forgery and interpretation of suicide notes or personal diaries.

MATERIALS AND METHODOLOGY

A survey paper was created. The survey was conducted at Annai Fathima College of Arts and Science Thirumangalam Madurai. A total of 70 samples, 35 each from male and female were collected from the students. Throughout the survey, DOMS.GL .0.6 pen was used and the participants were asked to fill the survey paper placed on the same table to avoid any errors. The participants were asked to copy down a given statement in the survey paper to a box provided. The primary examination was conducted for all the seventy samples that were collected. The samples were analyzed and compared properly by considering handwriting characteristics. The percentage of each characteristic exhibited by females and males was calculated and recorded.

RESULT AND DISCUSSION

While analyzing pen pressure, it was found that most of the males apply heavy pressure while writing whereas females seldom apply pressure while writing (Figure 1).

On close examination of all the samples, it was observed that most of the male's handwriting is slanted whereas the handwriting of most females is straight (Figure 2).

On comparing handwriting samples, the females have more completeness of letters than males (Figure 3).

While examining the size of letters (Figure 4), it was observed that only slight variations could be seen between males and females.



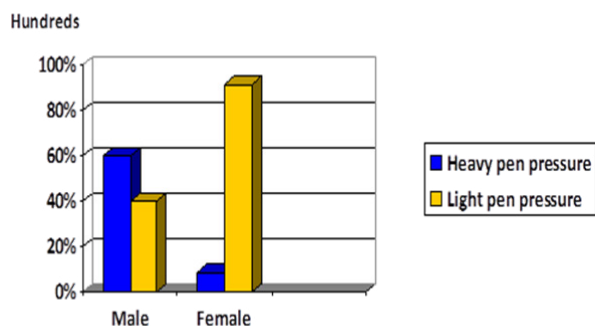


Figure 1: Graph depicting the correlation of gender and pen pressure

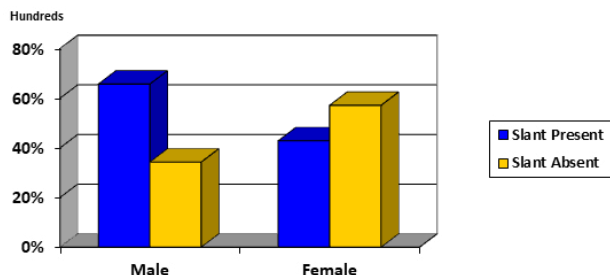


Figure 2: Graph depicting the correlation of gender and slanting

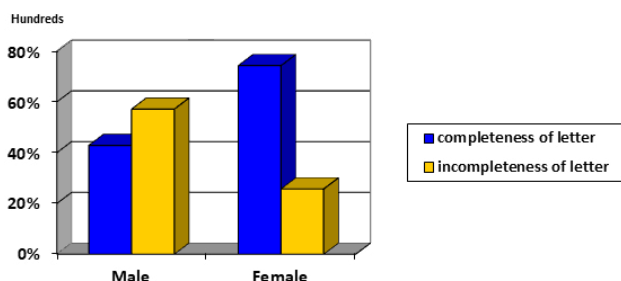


Figure 3: Graph depicting the correlation of gender and completeness of letter formation

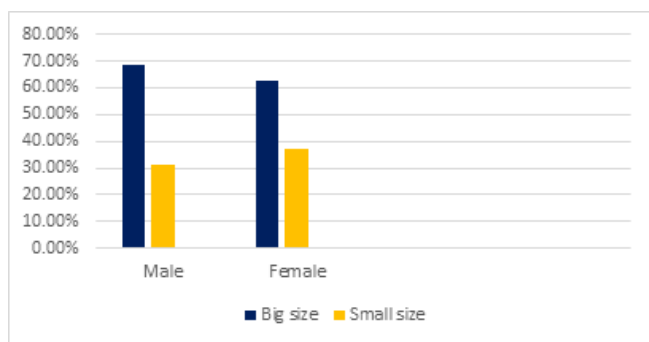


Figure 4: Graph depicting the correlation of gender and size of the letter

The handwriting of females is more uniformly spaced than males (Figure 5).

The positioning of diacritics is more accurately placed in females than in males (Figure 6).

It is possible to determine the gender from handwriting characteristics like pen pressure, slant of words, completeness of letters and placement of diacritics is possible as they show

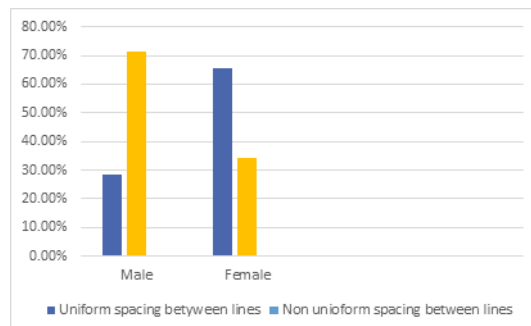


Figure 5: Graph depicting correlation of gender and uniformity of spacing between the lines

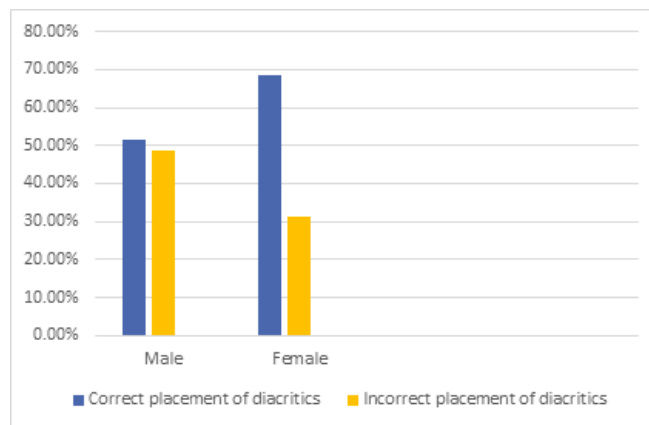


Figure 6: Placement of diacritics

a great difference in their percentage of similarity in male and female individuals whereas the size of letters show a slight difference in their percentage and hence cannot be used as a parameter for gender determination.

DISCUSSION

The primary purpose of handwriting analysis is to look for differences between two writing samples. Gender determination by handwriting analysis was aimed at finding out the differences exhibited in the handwriting samples of male and female genders.⁹ On average, males have bigger hands than females and their second fingers tend to be relatively shorter than their fourth fingers possibly resulting in a different writing style.¹⁰ Multiple mechanisms are identified to explain why men and women have different handwriting characteristics. One mechanism is the different physical features of men and women.¹¹ The second mechanism is that women have prenatal hormones that cause more feminine handwriting. The third mechanism, men have larger overall cerebral size than women after the brain development through the teen ages. Pen pressure, slant of words, completeness of letters, size of letters, spacing between lines and the placement of diacritics were examined.¹² Pen pressure and slant of words are more prominently exhibited by males than females. About 60% of males write with a heavy pressure which might be because men apply the force from their arm along with their fingers on the writing instrument rather than using fingers only.

About 65.71% of males have a slant in their handwriting than females. Completeness of letters, spacing between letters and placement of diacritics are more carefully followed by females. 74.28% of females have completeness of letters. In 68.57% of females place the diacritics correctly and 65.71% of females follow uniform spacing between lines, which might be because they are more attentive while writing and give more weightage for a neat presentation. The study published by Sumeet *et al.* (2013) concludes that there are significant differences in the writing of males and females. Dilara Oner *et al.*, published a study on gender determination based on the ascending and descending parts of the letters. The study was significant in differentiating male and female writings. Moreover, females write more slowly than males who give less weightage for a neat draft. Analyzing the size of letters does not give a clear distinction between males and females.¹³

CONCLUSION

Handwriting is the key evidence in cases of suicide notes, questioned documents, and personal diary notes. It is possible to determine the gender of an individual to some extent by analyzing pen pressure, slant of words, completeness of letters and positioning of diacritics. But there are chances that gender cannot be accurately determined by analyzing these characteristics due to individual differences and the mindset of the writer at the time of writing, writing instrument, plane of writing, etc. The analysis of handwriting will help to narrow down the conclusions to a female or a male.

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The Vital Role of Forensic Nurses in Caring for Abused Children

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ABSTRACT

Child abuse is a pervasive and deeply troubling issue that affects millions of children worldwide. To protect the well-being of young individuals and ensure their safety, forensic nurses, trained in forensic science and healthcare, play a crucial role in caring for abused children through a multidisciplinary approach, as they are uniquely equipped to provide specialized care, collect valuable evidence, and advocate for the rights of abused children. Forensic nurses work collaboratively with a range of professionals involved in child abuse cases, including law enforcement, child protective services, pediatricians, and attorneys. They are also indispensable members of multidisciplinary teams working to protect children from abuse, and their contributions have a profound impact on the lives of these vulnerable individuals.

Keywords: Child abuse, Forensic sciences, Forensic nurse, Nurse.

Int J Eth Trauma Victimology (2023). DOI: 10.18099/ijetv.v9i02.06

INTRODUCTION

Child abuse is a pervasive and deeply troubling issue that affects millions of children worldwide. It encompasses various forms of maltreatment, including physical abuse, sexual abuse, emotional abuse, and neglect. Recognizing and addressing child abuse is essential to protecting the well-being of young individuals and ensuring their safety. Forensic nurses play a critical role in this process, as they are uniquely equipped to provide specialized care, collect valuable evidence, and advocate for the rights of abused children.¹ This article explores the vital role of forensic nurses in caring for abused children, examining their responsibilities, the challenges they face, and the impact they have on the lives of these vulnerable individuals.²

Understanding Child Abuse

Child abuse is a complex and multifaceted issue that has far-reaching consequences on a child's physical, emotional, and psychological well-being. It can manifest in various forms, including:

Physical abuse

Physical harm inflicted on a child, such as hitting, slapping, or shaking, resulting in injuries or pain.

Sexual abuse

Inappropriate sexual conduct or contact with a child, including molestation, rape, or exposure to explicit material.

Emotional abuse

Persistent patterns of behavior that undermine a child's self-esteem, self-worth, or emotional development, such as constant criticism or rejection.

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How to cite this article: Santhosh S U, Shukla D, Rani SCM. The Vital Role of Forensic Nurses in Caring for Abused Children. *Int J Eth Trauma Victimology*. 2023;9(2):29-32.

Source of support: Nil

Conflict of interest: None

Received: 07/12/2023;

Received in revised form: 20/12/2023;

Accepted: 22/12/2023;

Published: 20/01/2024;

Neglect

Failure to provide adequate care, nourishment, supervision, or medical attention, leading to a child's physical or emotional harm.³

The impact of child abuse can be devastating, often resulting in long-term physical and psychological scars. Abused children may experience a range of emotional and behavioral issues, including depression, anxiety, post-traumatic stress disorder (PTSD), and even suicidal tendencies. It is crucial to identify and address child abuse promptly to protect the child's well-being and hold perpetrators accountable.⁴

The Role of Forensic Nurses

Forensic nurses are registered nurses (RNs) who have received specialized training in forensic science and healthcare. They play a pivotal role in caring for abused children within the context of a multidisciplinary approach. Their responsibilities encompass various aspects of assessment, treatment, evidence collection, and advocacy.⁵

Assessment and documentation

Forensic nurses are skilled in conducting thorough assessments of abused children. They perform comprehensive physical

examinations to document injuries, collect medical histories, and assess the child's emotional state. This assessment serves several purposes:

- *Identifying injuries*

Forensic nurses can identify and document injuries resulting from physical abuse, sexual abuse, or neglect. Their expertise allows them to differentiate between accidental injuries and those caused by abuse.⁶

- *Collecting evidence*

Forensic nurses collect and preserve valuable physical evidence, such as swabs for DNA analysis, photographs of injuries, and clothing with potential evidence, which may be critical in legal proceedings.

- *Assessing emotional well-being*

Forensic nurses also evaluate the child's emotional state, looking for signs of trauma, anxiety, or distress. This assessment helps inform the child's immediate and long-term care.⁷

Treatment and support

Forensic nurses provide immediate medical care and emotional support to abused children. This includes:

- *Pain management*

Administering appropriate pain relief for injuries or medical procedures.

- *Emotional support*

Offering a safe and empathetic environment where the child can express their feelings and fears.

- *Referral to specialized services*

Coordinating with other professionals, such as child psychologists, counselors, or child protective services, to ensure the child receives the necessary support and treatment.⁸

Collaboration with multidisciplinary teams

Forensic nurses work collaboratively with a range of professionals involved in child abuse cases, including law enforcement, child protective services, pediatricians, and attorneys. Their role within a multidisciplinary team is crucial for:

- *Information sharing*

Providing vital medical and forensic information that can aid in investigations and legal proceedings.

- *Advocating for the child*

Ensuring the child's physical and emotional needs are met while navigating the complex legal and healthcare systems.

- *Testifying in court*

Serving as expert witnesses in court, offering their professional insights on the child's injuries and providing objective, evidence-based testimony.⁹

Challenges Faced by Forensic Nurses

Forensic nurses working with abused children face a multitude of challenges due to the sensitive nature of their work. Some of the key challenges include:

Emotional toll

Constant exposure to child abuse cases can take an emotional toll on forensic nurses. Witnessing the suffering of abused children can lead to burnout, compassion fatigue, and secondary trauma.

Legal complexities

Forensic nurses must navigate the intricate legal landscape surrounding child abuse cases. This includes preparing for court appearances, ensuring evidence integrity, and adhering to strict chain of custody protocols.

Interpersonal dynamics

Collaborating with multiple stakeholders, such as law enforcement, child protective services, and attorneys, can be challenging. Effective communication and collaboration are essential to ensure the child's best interests are prioritized.

Ethical considerations

Forensic nurses must navigate ethical dilemmas, such as reporting suspected abuse, ensuring patient confidentiality, and balancing the child's immediate safety with their long-term well-being.

Limited resources

In some healthcare settings, resources for caring for abused children may be limited. Forensic nurses may face challenges in accessing specialized training, equipment, and support services.

Despite these challenges, the dedication and commitment of forensic nurses to caring for abused children are unwavering. Their expertise and advocacy are essential in protecting the rights and well-being of vulnerable children.¹⁰

Impact on Abused Children

Forensic nurses play a vital role in the lives of abused children, and their contributions have a profound impact:

Physical healing

Forensic nurses are often the first healthcare professionals to provide care to abused children. Their prompt and expert medical attention can facilitate the physical healing process, preventing further harm.

Emotional support

Abused children often feel frightened, vulnerable, and overwhelmed. Forensic nurses create a safe and compassionate environment where children can begin to heal emotionally, rebuild trust, and regain a sense of security.



Access to justice

Forensic nurses collect and preserve crucial evidence that can be used in legal proceedings to hold perpetrators accountable for their actions. This not only ensures justice for the child but also helps prevent future abuse.

Prevention and intervention

By documenting and reporting cases of child abuse, forensic nurses contribute to early intervention and prevention efforts. Identifying patterns of abuse within families or communities can lead to targeted interventions and support services.

Empowerment

Forensic nurses empower abused children by listening to their concerns, validating their experiences, and advocating for their rights. This empowerment can be transformative for a child who has felt silenced or powerless.¹¹

Training and Education

To excel in their roles, forensic nurses must undergo specialized training and education. This includes:

Forensic nursing programs

Many universities and colleges offer forensic nursing programs that provide the necessary knowledge and skills to work in this field. These programs cover topics such as forensic evidence collection, legal aspects of child abuse, and trauma-informed care.

Certification

Some forensic nurses seek certification in pediatric forensic nursing or sexual assault nursing. These certifications demonstrate their expertise and commitment to providing high-quality care to abused children.

Ongoing education

Given the evolving nature of healthcare and forensic science, forensic nurses must engage in ongoing education and training to stay current with best practices and emerging research.¹²

DISCUSSION

The article highlights the critical issue of child abuse and the pivotal role played by forensic nurses in addressing this widespread problem. Child abuse takes various forms, including physical, sexual, emotional, and neglect, and its consequences can be devastating for the affected children. Identifying and addressing child abuse promptly is essential to protect the well-being of these vulnerable individuals.

Forensic nurses are well-equipped to handle cases of child abuse due to their specialized training in forensic science and healthcare. They have a range of responsibilities, including assessment, evidence collection, treatment, and advocacy. Their assessment skills are crucial in identifying injuries, distinguishing between accidental and abusive injuries, and assessing the emotional well-being of abused children.

Furthermore, they play a crucial role in preserving and collecting evidence that can be vital in legal proceedings.

One of the key strengths of forensic nurses is their ability to provide immediate medical care and emotional support to abused children. This aspect of their role helps address both the physical and emotional trauma experienced by the victims. Additionally, their collaboration within multidisciplinary teams is essential for sharing information, advocating for the child's needs, and providing expert testimony in court.

Despite their critical role, forensic nurses face several challenges, including the emotional toll of dealing with child abuse cases, legal complexities, and the need for effective communication with various stakeholders. These challenges highlight the need for comprehensive support systems and resources for forensic nurses in their crucial work.

The impact of forensic nurses on abused children is profound. They facilitate physical healing, offer emotional support, contribute to access to justice, aid in prevention and intervention efforts, and empower children to speak up and seek help. Their work not only helps individual victims but also has broader societal implications in preventing future abuse.

The article emphasizes the importance of training and education for forensic nurses, highlighting the need for specialized programs, certifications, and ongoing learning to stay updated with the latest practices and research.

The article sheds light on the indispensable role that forensic nurses play in addressing child abuse. Their expertise, dedication, and commitment are crucial in protecting and healing abused children. Recognizing and supporting the work of forensic nurses is essential for enhancing their ability to safeguard the well-being of our most vulnerable members of society – our children.

CONCLUSION

The vital role of forensic nurses in caring for abused children cannot be overstated. Their expertise in healthcare and forensic science, combined with their dedication to the well-being of vulnerable children, makes them indispensable members of multidisciplinary teams working to protect children from abuse. Despite the challenges they face, forensic nurses continue to make a significant impact on the lives of abused children by providing healing, support, and justice.

Healthcare institutions, policymakers, and the broader community must recognize and support the invaluable work of forensic nurses in the fight against child abuse. By providing them with the resources, training, and recognition they deserve, we can further enhance their ability to protect and care for the most vulnerable members of society – our children.

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Introduction of a Pilot Study

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ABSTRACT

A pilot study investigates whether something is feasible, whether it should be followed by the researchers, and if so, how Pilot research, however, also has a unique design element; it is carried out on a smaller scale than the primary or full-size investigation. In other words, the pilot study is crucial for enhancing the effectiveness and quality of the main study. Additionally, it is carried out to examine the randomization and blinding process, evaluate recruitment potentials, increase researcher experience with the study methods or medications and interventions, and provide estimates for sample size calculation. The misconceptions and the ethical implications of a pilot study are the main topics of this paper. This review also introduces how to interpret the findings of a pilot research.

Keywords: Feasibility, Methodology, Pilot.

Int J Eth Trauma Victimology (2023). DOI: 10.18099/ijetv.v9i02.07

INTRODUCTION

An effective research study with a pertinent experimental design and precise execution is necessary to get high-quality results. The main study, sometimes referred to as the full study or large-scale main trial, can be carried out to great advantage by first analyzing its viability. Often a smaller-scale study, a pilot study is the initial step in the overall research procedure and aids in the planning and adaptation of the primary study.^{1,2} To be more precise, the pilot or small-scale study frequently comes before the main trial in large-scale clinical investigations to assess the validity of the results. Before starting a pilot study, researchers must have a complete understanding of the experiment's objectives, research question, experimental design, and timetable. Through the pilot study, researchers learn about the processes involved in the major study, which helps in choosing the research method most suited for addressing the research topic in the main trial. Despite the advantages and significance of the pilot study, researchers frequently show little enthusiasm for it.

OBJECTIVES OF A PILOT STUDY

Feasibility of the Study Protocol

An evaluation of the inclusion and exclusion criteria for the participants, preparation of the drugs and intervention, storage and testing of the instruments used for measurements in the study, as well as training of researchers and research assistants, validates the feasibility of the study.³ The researcher, as well as the research assistants, must completely understand the purpose, method, and proceed additionally, the method's viability for data collecting needs to be evaluated.

Randomization and Blinding

A pilot study evaluates the effectiveness of the randomization and blinding.⁴⁻⁶ For instance, the precise preparation, storage,

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How to cite this article: Anupama K, Chaudhary P, Lakshmi T. Introduction of a Pilot Study. *Int J Eth Trauma Victimology*. 2023;9(2):33-35.

Source of support: Nil

Conflict of interest: None

Received: 30/08/2023;

Received in revised form: 04/12/2023;

Accepted: 08/12/2023;

Published: 20/01/2024;

and delivery methods are evaluated to properly use the sealed opaque envelopes method, which is frequently used in clinical studies.⁷ Papers with random numbers are arranged according to the sequence of the assignments and placed inside an opaque envelope. These envelopes are kept in the pharmacy division and made available by the division when needed. Both the recipient and the provider must sign the document at the time of provision. According to the researcher's plans, the randomized groups' uniformity in terms of demographic traits, the appropriateness of blinding, and the participants' comprehension of randomization can all be evaluated. Additionally, the best strategy for informing patients about randomization and getting their agreement can be evaluated. Benger *et al.*'s³ study

Recruitment and Consent

The researcher finds the subjects and gets their permission to participate. The participants should be given enough time and information to make an informed choice and give their written consent. Following that, volunteers should be assessed to determine if they are appropriate for the trial. It is decided on the suitability of the consent form, recruiting rates, the amount of time it will take to get written consent, and the necessary number of researchers and research assistants. The recruiting rate is specifically correlated with the length of the study (duration) and its success or failure.⁸ The experimental

procedures can be changed to boost the recruitment rate as well. Vemulakonda and Jones found that observational cohort studies, in which carers chose the course of treatment, had greater recruitment rates than randomized clinical trials in their investigation of pediatric urological patients.⁹

Selection of the Most Appropriate Primary Outcome Measure

The major result that most accurately reflects the researchers' goals is difficult to choose. Additionally, the computation of the sample size is directly related to the main consequence. A sample size for each primary result is necessary if there are several primary outcomes needed. Mouton *et al.*¹⁰

Sample Size Calculation

Pilot research is essential to gather the basic data needed to determine the sample size for the primary outcome. Preliminary information is required for continuous outcomes, such as the mean and standard deviations for the control group. Preliminary information is needed for categorical outcomes, such as the conventional treatment's success rate.¹¹ To determine the sample size while choosing several primary outcomes, the preliminary data for each outcome must be gathered.

Effect Size and Sample Size Estimation

To determine the sample size for a study, a pilot study is often conducted first. However, it is important to exercise caution when estimating the sample size needed for the main experiment.^{2,11,12} The standardized effect size, or Cohen's *d*, is needed to calculate the sample size for the main trial. Unfortunately, the pilot studies estimated standardized effect size, which has a confidence interval, was determined from a sample of data. The confidence interval for the standardized effect size is quite large due to the small sample size, and the corresponding sample size likewise has a wide range. This could consequently result in mistakes being made when estimating the sample size or statistical power to be applied in the primary trial.¹²

Internal Pilot Study

Internal pilot research must be carefully designed at the main study's study design stage and included in the study method to be carried out. In addition, the researchers must take into account the fact that other than determining the sample size, adjustments in other categories related to the primary study cannot be made. The hypothesis that the main study and pilot study are independent of one another is another crucial factor to take into account. This hypothesis states that there is a modest higher risk of a type 1 error.¹

Analysis of a Pilot Study

The possibility of testing the hypothesis through the analysis of a pilot study is a matter of concern. The researchers must acknowledge that pilot studies are not for testing

hypotheses because the required power and sample size were not determined for the study.⁴ As a result, they must exercise caution when disclosing the findings of a pilot study. Furthermore, just because a pilot study reaches statistical significance does not mean that the major study or trial is not still necessary.¹³

How to Interpret the Results of a Pilot Study

There should be a list of prerequisites for a pilot study before it begins. The researcher determines whether to carry out the primary study as planned or to change the study design based on whether these requirements are met. In addition, findings from the pilot study are discussed in light of these circumstances. One of the following results² can be used to characterize typical pilot research outcomes:

- Termination of the study (cannot move forward with the main study).
- Ability to move forward with the main study after changing the study design.
- Absence of the need to change the research design but need for careful monitoring throughout the study processes.
- Ability to move forward without changing the study design.

Thabane *et al.*² provided a checklist for pilot studies using the CONSORT statement. A brief description is provided below: Must be noted that the study is a "pilot study" in the title.

In the introduction, the background for the main study and rationale for performing the pilot study should be written.

- The categories for evaluating the validity of the procedures and standards to be used in the primary study should be outlined in the techniques section, and the standards for validity should be developed.
- Participants' inclusion and exclusion criteria, specific administration and treatment procedures, descriptions of the primary and secondary outcomes, the process and justification used to choose the sample size, and techniques for acceptable statistical analysis should all be documented.
- The validity of the discussed points in the methodology part, as well as the points that need to be adjusted, are stated in the findings section, and solutions are sought.
- Additionally, a description of the baseline data and the participants' recruitment status is provided. Additionally presented is data on the major and secondary outcomes, including mean, standard deviation, 95% confidence interval, probabilities, etc.
- The key topic of discussion should be determining the viability of the main study. Standards and things from earlier lists are condensed here. There is a list of potential biases or experimental issues that may arise in the primary study.

Finally, depending on the results of the pilot study, it is assessed and explained whether or not a major study is possible.¹⁴



Summary

A pilot study provides important information for determining the sample size as well as for evaluating all other components of the primary study, eliminating the need for extra work from the researchers and participants as well as the waste of research resources. The elements mentioned in the text must be precisely defined before the pilot research begins and show a high level of completion for it to fulfill its purpose. Additionally, a pilot study yields useful data that may be used for the researcher's primary study as well as other studies of a similar nature. For this reason, it is critical to provide comprehensive information on the feasibility of the investigation.

Critique

Researchers frequently suggest that a pilot study should examine the "preliminary safety" of an intervention; however, because pilot studies typically involve small sample sizes, they are unable to provide useful information on safety except in rare circumstances, such as when a death occurs or repeatedly serious adverse events are reported. Suspected safety issues are often minor or infrequent for the majority of interventions suggested by NCCIH investigators, making them unlikely to be discovered in a small pilot trial. Group-specific rates with 95% confidence intervals for adverse events should be reported if any safety issues are found. Investigators cannot, however, conclude that the intervention is risk-free if no safety issues were revealed in the pilot trial. (NCCIH Research Framework).

CONCLUSION

A pilot study yields useful data that may be used for the researcher's primary study as well as other studies of a similar nature. For this reason, it is critical to provide comprehensive information on the feasibility of the investigation.

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Mobile Forensics: A Valuable Instrument or a Challenge in Forensic Industry

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ABSTRACT

Mobile forensics is the science of recovering digital evidence from a mobile device under forensically sound conditions using accepted methods. Mobile device forensics is a subfield of forensic science called "digital forensics" is dedicated to the retrieval and examination of unprocessed data found on electronic or digital devices. The procedure aims to retrieve and extract any data from a digital device without changing the data that is already on the device. Digital forensics expanded throughout time in tandem with the swift expansion of computers and other digital devices. Depending on the kind of digital device involved, there are several subfields of digital forensics, including computer, network, mobile, and so on. The study of recovering data from a mobile phone in a way that complies with forensic standards is known as mobile phone forensics. This covers the whole process of retrieving and analyzing data from the SIM/USIM, the phone body, and any optional memory cards. Call timings, contact numbers, text or SMS messages, photos, videos, and other types of data may all be recovered and analyzed.

Keywords: Digital forensics, Mobile forensics, Media.

Int J Eth Trauma Victimology (2023). DOI: 10.18099/ijetv.v9i02.08

INTRODUCTION

The process of extracting digital evidence from mobile devices using recognized techniques is known as mobile forensics. Mobile forensics, in contrast to typical digital forensics procedures, is limited to the recovery of data from mobile devices, including tablets, smartphones, and android phones. Law enforcement may greatly benefit from the wealth of information found on mobile devices, including location data, text message histories, and site search histories.¹

The gathering of data from mobile devices has become a crucial component of forensic investigations and is frequently utilized as convincing evidence. It is crucial to have a complete grasp of forensic tools and their properties to extract relevant data.¹

Importance of Mobile Forensics

Mobile forensics are crucial since mobile devices save a lot of data that may be required to comprehend the entire picture and extent of a cyberattack. There were 15 billion mobile devices in use globally in 2021. That comes to almost two per person.²

It's incredible how much data is kept on these devices. The fact that systems are no longer absolute and isolated distinguishes mobile computer forensics from traditional computer forensics. Common place electronics can function as a single network thanks to its interconnectivity, including phones, automobiles, cameras, doorbells, and even refrigerators.²

Mobile phone forensics may be performed on the cellular network usage of a specific mobile phone to determine the location and time of calls made, as mobile phones are frequently utilized during many types of criminal behavior. This is especially helpful in situations similar to stalking, where someone has been harassed *via* a cell phone.³

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How to cite this article: Shukla D, Parashar KK. Mobile Forensics: A Valuable Instrument or a Challenge in Forensic Industry. *Int J Eth Trauma Victimology*. 2023;9(2):36-38.

Source of support: Nil

Conflict of interest: None

Received: 01/12/2023;

Received in revised form: 15/12/2023;

Accepted: 20/12/2023;

Published: 20/01/2024;

These days, police officers' first port of call is mobile phone forensics in addition to the computer. Where will you probably keep all of your records? Where will the records of wrongdoings be kept? Human nature dictates that you will notify someone about wrongdoings, even if you are not the kind to document them.³

They may be kept on a computer in a variety of locations, including your PST (Microsoft Outlook personal storage file), EDB (Microsoft Exchange storage file), NSS (Lotus Notes), MSG (Microsoft Outlook Express), and EML (generic email files). All of these files are stored digitally on a variety of storage devices, such as SIM cards for mobile phones, maybe 3G USIM cards, and ordinary mobile phone memory, digital copies of all this information are stored on a variety of storage devices, such as subscriber identity module (SIM) cards for mobile phones, maybe 3G USIM cards, standard mobile phone memory, or internal memory cards; they are mostly, though not just, multimedia card (MMC) cards.⁴

To guarantee that a thorough examination of all available data has been completed for the client in a sound and

forensically correct manner, a forensic investigator today must possess solid knowledge of evidence handling, write-blocking, and general computer forensics (Figure 1).⁵

They can no longer rely solely on their mobile phone investigative resources.

Preservation and Documentation

It's critical to preserve the crime scene while collecting evidence. The cell phone cannot just be taken off of the crime scene. Other types of evidence, such as fingerprints and DNA traces, must also be preserved with care. Moreover, appropriate documentation is required for every piece of evidence, as well. A minimum of a few photos of the undisturbed/unmoved phone and details on the time and place of the accusation should be included in this evidence. Noting whether the phone was turned on or not is also crucial.⁵

Acquisition

Actual data from the gadget is obtained at this step. This assembly can happen in several ways. Ideally, both the SIM card and the phone's data are forensically duplicated. Sometimes a device's digital accusation can't be made due to technological issues. In the worst situation, all that may be obtained are phone screenshots.⁵

Examination and Analysis

The collected data is currently being examined for any hints about the potential crime. To examine these hints in more detail, refer to Figure 1. Software tools can assist with the examination, or it can be completed by hand. For that goal, a variety of software solutions are available. Utilizing a variety of software tools is essential. Since there is no magic bullet, effort must be made to ensure that no important piece of evidence is overlooked because a certain instrument lacks a necessary characteristic.⁶

Reporting

The final stage is the most crucial. It can take a long time to acquire the evidence and present it in court. Examiners

need to be able to provide conclusive evidence and inform the opposing side about the instruments and techniques they used. If the evidence is not permitted into evidence in court, it is worthless. This can occur if the evidence's provenance or acquisition is questioned, raising doubts about its legitimacy.

Types of Evidence

Address book

Various contact details are kept in the address book. An understanding of the suspect's social network can be obtained with the use of the address book. One purpose for it would be to connect a suspect to a victim.⁷

Call history

The call history provides more detail on the owner's actions before the mobile phone was acquired. The duration of the most recent incoming and outgoing calls is visible. Indirect implications can also be drawn from this data.⁷

Short message service (also available in emails on new phones)

While phone histories and address books only provide oblique information, SMS and email communications provide specific information as opposed to the address book and call history, which only provide oblique information. They may include the owner's real writings, either meant for the owner or authored by them, which could be used as evidence in court.⁸

Calendar

The calendar provides a summary of the owner's previous and upcoming activity. It can be used to identify potential witnesses and connect the owner to specific times and locations.

Additional media

Numerous more pieces of information can also be found on more recent mobile phones.

The camera comes first. Films and images can also include proof. Not just in terms of their content, but also in terms of the exchangeable image file format (EXIF) (information contained within files that provides additional details). It's possible that the criminal used the photo as a trophy for their crime. The precise time and date of a photo's capture, as well as its location in some circumstances, can be found using the EXIF data. A global positioning system (GPS) receiver is included with some cell phones. The mobile phone's applications cannot affect the receiver's ability to store location and time data. to connect the owner to potential crime scenes or provide an alibi.⁸

Current problems

Forensics on mobile devices face numerous challenges. They will be examined in this paper in the order that they appear in an examination.⁸

When the cell phone is discovered at the crime site, the first issue arises. Everything works perfectly when the phone

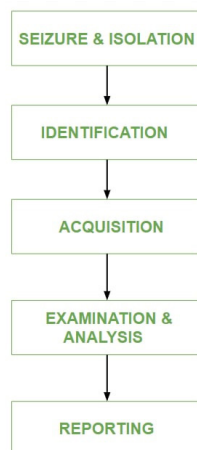


Figure 1: Process of mobile forensics

is turned off, however, there is a problem when it is turned on. It is feasible to tamper with the evidence if the phone is left on. Some versions have a limited quantity of data storage—20 SMS, for instance. The evidence is gone if the offender decides to delete it by sending 20 pointless texts from a different phone.⁸

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Finding the phone is another issue. Numerous manufacturers provide an extensive range of models, with new versions being released on a nearly regular basis. Before the investigation can start, any phone discovered at the scene of a crime must be identified so that the specialist may become acquainted with it. There are various approaches to completing this. Typically, the side of the device displays the logos of the wireless carrier and the manufacturer. However, this is just the beginning. Some websites make an effort to be helpful.⁹

The selection of appropriate software for a given phone presents the next challenge. As was already noted, a wide variety of hardware and software solutions are available. Each of them offers benefits and drawbacks in terms of the software features and supported models. In this case, the investigator must rely on prior knowledge. In a perfect world, he would be familiar with the phone model and its optimal software. The investigator deals with new phones in the real world as well. Here, he must use extreme caution to avoid destroying any evidence.¹⁰

The SIM lock is another issue. Personal identification numbers (PINs) can be used to secure SIM cards and the data on them. Only three attempts are allowed at the SIM, and ten attempts are allowed for the personal unblocking code (PUK). Asking the owner for the PIN is an excellent practice if a phone is found; if not, calling the manufacturer to get the SPUK is the sole option. One needs to be aware of the integrated circuit card identifier (ICCI) to select the PUK. Usually, this number is printed on the SIM's outside.¹⁰

Use of Mobile Evidence

The important aspects for which mobile evidence is being presently used are:

- To find out the numbers to which calls have been made from a given mobile with date and time
- To find out the numbers from which the calls have been received in a given mobile with date and time
- To know the contacts through the phone book.
- To know the details of recent SMS messages received
- To know the details of SMS templates
- To know the ring tones and games stored in the instrument
- To know the pictures and video clips stored in the mobile either on the SIM card or a flash memory card.¹¹

Cell Phone Forensic Tools

- MOBILedit! Forensic (software)
- Intaforensics - ART – Mobile (software)
- BitPIM (software)
- The.XRY/XACT System Bundle (hardware)
- Cellebrite (UME/UFED-hardware)
- EnCase® Neutrino® (hardware)
- AccessData – MPE (hardware)
- DataPilot SecureView (hardware)
- Paraben's Device Seizure Toolbox (hardware)

DISCUSSION

As can be seen now these days mobile gadgets are all around us and developing into complete computing systems. Therefore, these gadgets are now essential in both criminal and civil investigations as evidence. As was already established, mobile devices—particularly smartphones—produce a wealth of unrelated data that can be quite beneficial to investigators. Even the most well-known manual procedures, nevertheless, might not be able to find this information.

We must be aware as mobile forensic technologies provide a significant solution to the issues. These sophisticated solutions make use of cutting-edge technologies like artificial intelligence and big data to efficiently and forensically soundly expose all of the data on these gadgets. Mobile forensic technologies are crucial for solving crimes of all kinds.

CONCLUSION

Mobile forensics plays an important role in the forensic industry as it preserves forensic integrity while retrieving pertinent data or digital evidence from a mobile device. To do this, the mobile forensic method needs to create exact guidelines for safely obtaining, separating, moving, storing for further analysis, and verifying digital evidence that comes from mobile devices.

Mobile forensics procedures are typically similar to those of other digital forensics specialities. But it's crucial to remember that the mobile forensics procedure has particulars of its own that need to be considered. If the study of mobile devices is to produce fruitful results, appropriate techniques and guidelines must be followed.

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Dear Editor,

Nurses participate in the implementation of a wide range of medical procedures and are actively involved in providing nursing care in all areas of medicine. Under the consideration of good medical procedures related to resolving certain court cases, the nurse of this profile should be familiar with criminal law regulations, particularly criminal law, crime and forensics. Today, nursing has changed from a passive state to an independent, decision-maker profession. To play advanced nursing roles, in addition to professional concepts, nurses should be familiar with legal concepts not only to provide quality care in multidisciplinary teams but also to defend their rights in appropriate situations.

Forensic nursing is a specialty in the nursing discipline, which brings the concepts as well as principles of both law and nursing sciences together to meet the needs of the health care system with legal problems. The advancement of forensic nursing in the last decade has developed a new and better image of the nursing profession and provided services to living and dead people. This discipline provides a new perspective on the approach of holistic care for patients at hospitals or community centers involved in legal issues. Today, applying legal sciences in nursing has formed wider roles in clinical research related to crime and legal processes to promote public health and safety.

Through research, professionals actively seek new knowledge, stay updated on industry trends, and expand their understanding of evolving concepts. Publishing is an important aspect of academic writing as it allows researchers to share their work with others, receive feedback, advance their careers, and contribute to the development of their field of study.

I hope that you will produce great research work with your invaluable contributions. Your assistance has been instrumental, and I am deeply appreciative of your support. Please know that your efforts have made a significant impact, and I am fortunate to have you as a trusted resource.

Thank you for all your efforts

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Prof. cum Principal

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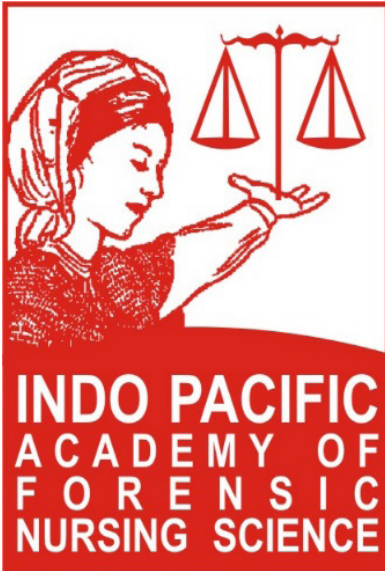


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2st Issue of Volume 9, 2023

at the release of

of

**International Journal of Ethics,
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