ORIGINAL ARTICLE

Knowledge, Attitude and Awareness of Nurses Towards Forensic Dentistry: A Questionnaire-based Survey

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Abstract:

Introduction : Forensic odontology has an important role in crime investigation. Dentistry has much to offer law enforcement in the detection and solution of crime or in civil proceedings. Indeed, nursing is considered as a noble profession owing to the care and sympathy with greater understanding for all human beings regardless of any dissonances. They are being called the bulwark of healthcare profession becoming a significant connecting link between the victims and forensic odontologists. So, forensic dental fieldwork requires an interdisciplinary knowledge of dental sciences.

Aim: To analyse the knowledge and attitude towards forensic odontology among nursing students and nursing staff.

Materials & Methods: A questionnaire based cross-sectional survey using google forms was conducted among nursing students and nursing staff. The questions assessed their knowledge and attitude towards forensic odontology.

Results: In this study, 83.7% participants were interested in formal training in the field of forensic odontology. Also 57.7% help doctors in maintaining dental records of their patients. About 52.6% agreed that like thumbprint we can use tongue print for identification of an individual.69.9% knew that DNA analysis can be done using teeth. Overall, 89.1% were interested to participate in workshops and seminars on forensic odontology.

Conclusion: Forensic odontology requires interdisciplinary knowledge of dental science. A questionnaire was circulated among 256 nursing students and staff. In which Nursing Students had inadequate knowledge and awareness 47.7% and 43.6% and Nursing Staff 52.3% and 56.4% respectively. This survey showed that nursing students and staff are interested in attending formal training in Forensic Odontology.

Keywords: Forensic Odontology, questionnaire, interdisciplinary, knowledge

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INTRODUCTION

Forensic science is a branch of science that deals with the area of endeavor used in a judicial setting which is accepted by the court and by the general scientific community to demonstrate the truth of the situation. Forensic Science with its multi-disciplinary approach is the essential link that helps to glue together all kinds of evidence in any form of investigation Forensic Medicine has many branches, one of its emerging branch is Forensic Odontology.

FDI defines Forensic Odontology (FO) as a branch of dentistry which in the interest of justice deals with the proper handling and examination of dental evidence and proper evaluation and presentation of dental findings[1]. This field has tremendous scope in areas of investigation[2]. The branch delves in identifying unknown human remains, victim's identification in mass disaster, assessing sex of skeletal remain, age estimation of both living and deceased, evaluation of cases of violence and recognition of bite marks at crime scenes[3]. The medical professionals are the first line of primary health care providers. They encounter a large number of medicolegal cases such as victims of abuse, mass disasters and other organized crime. Although forensic odontology is establishing its significant role in crime scene investigations most of the health care providers have insufficient knowledge about it. Although the forensic odontologist has a pivotal role in the investigation, health care providers such as the medical care staff who are present as primary staff in the emergency medicine should have the potential to detect, inform and interact with dentist for further applications in legal issues[4].

The forensic discipline of law involves the application of science and technology in investigation and detection of crime and administration of justice. A coordinated efforts of a multidisciplinary team comprising specialists in the medical, paramedical, dental, law enforcement authorities and forensic fraternity. Nurses are being called the bulwark of healthcare profession. They are trained to care for the sick and help doctors or dentists. Forensic nurses are those who cares for the forensic patients and helps the forensic investigators at the crime scene. Application of knowledge and practices of nursing for the purpose of law is forensic nursing[5].They are a significant connecting link between the victims and forensic odontologists. With this background, we aim to conduct a survey to analyse the knowledge and the awareness towards forensic odontology among nursing students and nursing staff.

MATERIALS AND METHODS:

A cross-sectional study was conducted to determine the knowledge and awareness of forensic odontology among the nursing staff and students of Aurangabad. A structured questionnaire consisting of 26 open ended questions organized in google form was circulated amongst them (Table 1). A total of 256 participants with 211 nursing students and 45 nursing staff participated in the survey. With informed consent from all the participants, data was collected and analysed. The results were calculated on a percentage basis and tabulated (Graph-1).

Sr No.	Questions	Results
Table 1: Responses of the participants to the questions related to Forensic Dentistry		
1.	Is Forensic Dentistry a part of Forensic Medicine?	
	Yes	89.7%
	No	10.3%
2.	Are you aware of the branch called Forensic Dentistry or Forensic Odontology?	
	Yes	69.2%

	No	30.8%
3.	Do you know Forensic Dentistry can play a role in victim/deceased and criminal identification?	
	Yes	85.9%
	No	14.1%
4.	Have you had any formal training in collecting, evaluating and presenting the dental evidence?	
	Yes	78.8%
	No	21.2%
5.	Do you help in maintaining any dental records of your patients?	
	Yes	57.7%
	No	42.3%
6.	Are you aware of the significance of maintaining dental records in identifying the deceased and crime suspects?	
	Yes	69.9%
	No	30.1%
7.	Have you handled any forensic dentistry-related cases before?	
	Yes	14.1%
	No	85.9%
8.	Are you aware of any criminal case in India solved by the virtue of Forensic Dentistry?	
	Yes	48.7%
	No	51.3%
9.	Do you know about the Forensic Odontologists in India?	
	Yes	41%
	No	59%
10.	Do you think the age and gender of a deceased person can be identified in a mass disaster using forensic odontology?	
	Yes	67.3%
	No	32.7%
11.	Are you aware that forensic dentistry helps in age estimation using teeth?	
	Yes	74.4%
	No	25.6%
12.	Do you think gender determination is possible with the help of teeth and facial bones?	
	Yes	71.8%
	No	28.2%
13.	Are you aware of the bite mark patterns of teeth?	
	Yes	65.4%
	No	34.6%
14.	Do you consider bite marks pattern of teeth as an important adjunct for assessing the crime scene?	
	Yes	79.5%

	No	20.5%
15.	Do you know analysing lip prints can serve as a source in identification of an individual?	
	Yes	64.1%
	No	35.9%
16.	What is the study of lip prints in Forensic Dentistry called?	
	Amelogyphics	34%
	Cheiloscopy	22.4%
	Dermatoglyphics	3.2%
	Don't know	40.4%
17.	Like thumbprint can we use tongue print for identification of an individual?	
	Yes	52.6%
	No	47.4%
18.	Do you know DNA analysis can be done using teeth?	
	Yes	69.9%
	No	30.1%
19.	Can sex determination be done using Barr bodies?	
	Yes	73.1%
	No	26.9%
20.	Can saliva serve as a source of DNA?	
	Yes	78.2%
	No	21.8%
21.	How can you identify physical/neglect/sexual abuse of a child?	
	Physical injury	4.8%
	Behavioural changes	4.8%
	Any scars	1.3%
	All of above	89.1%
22.	What action you take when u identify child abuse?	
	Inform police	64.1%
	Inform parents	32.7%
	Take no action	3.2%
23.	Do you examine for bite marks in child abuse?	
	Yes	67.9%
	No	32.1%
24.	Did you know the court of law accepts the statement of dentist as an expert witness involving civil and criminal cases?	
	Yes	66.7%
	No	33.3%
25.	Do you think there is any chance for facial reconstruction even if the facial structures are deteriorated?	
	Yes	38.5%
	No	5.7%
	Maybe	55.8%
26.	Are you interested to participate in workshops and seminars in forensic odontology?	
	Yes	
	No	10.9%

Graph no: 1 Percentage score of questions to the nursing students and staff
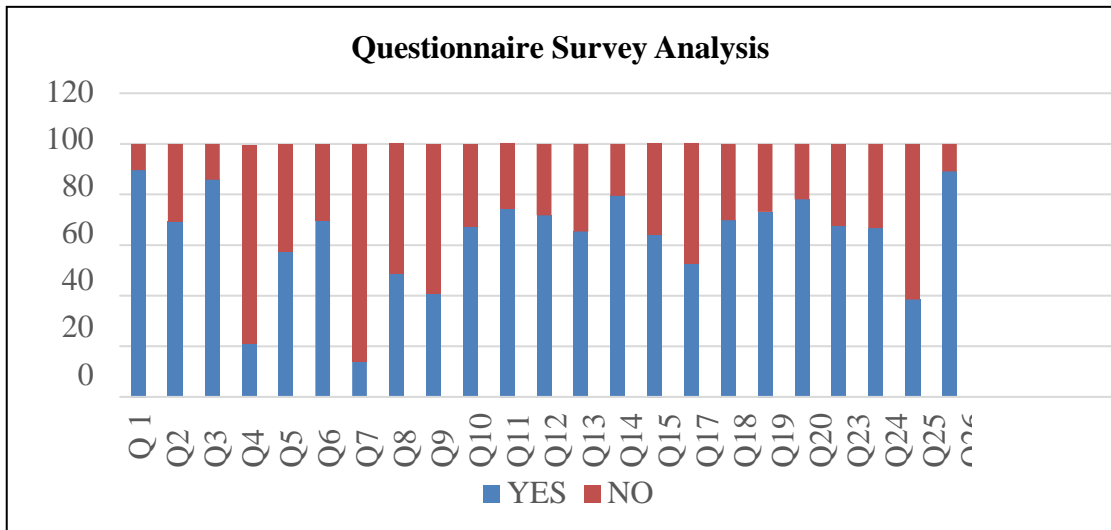
RESULTS:

In this study 256 participants including 211 nursing students and 45 nursing staff participated in the survey (Table 3). The ratio of female to male participants was 80.8: 19.2 (Table 2). Many of the nursing students and staff (69.2%) knew about the branch Forensic Dentistry while 30.8% had no idea about the speciality. About 89.7% nursing students and staff conceive that Forensic Dentistry a part of Forensic Medicine. 85.9% of them realized that Forensic Dentistry can play a role in victim/deceased and criminal identification. Also, 21.1 % of nursing students and staff had no notion of formal training in collecting, evaluating and presenting the dental evidence. (Graph-3)

About 69.9% were aware of the significance of maintaining dental records in identifying the deceased and crime suspects while 42.3% were unfamiliar with maintenance of dental records. 57.7% helped in maintaining dental records of patients. About 14.1% had handled forensic dentistry related cases before while 85.9% were unaware of forensic dentistry related cases. Also 48.7% were aware of criminal case in India solved by the virtue of Forensic Dentistry and 51.3% were unacquainted about it. About 59% were careless about the Forensic Odontologists in India and 41% knew about the Forensic Odontologists in India

About 67.3% thought that age and gender of a deceased person could be identified in a mass disaster using forensic odontology. 74.4% nursing students and staff were aware that forensic dentistry helped in age estimation using teeth and 25.6% were not familiar about role of teeth in age estimation in the field of forensic dentistry. 71.8% conceive that gender determination was possible with the help of teeth and facial bones.

79.5% considered bite marks pattern of teeth as an important adjunct for assessing the crime scene. About

65.4% were aware of the bite mark patterns of teeth. About 64.1% knew that analysing lip prints could serve as a source in identification of an individual. About 22.4% agreed that Cheiloscopy is the study of lip prints in Forensic Dentistry and 40% were unfamiliar about lip prints. About 52.6% agreed that like thumbprint, tongue print can be used for identification of an individual and 47.4% were oblivious about tongue print. Also 69.9% knew that DNA analysis could be done using teeth. About 73.1% agreed that sexdetermination could be done using Barr bodies. About 21.8% realized that saliva can serve as a source of DNA. 78.2% conceive that saliva serves as a source of DNA. About 89.1% nurses were able to identify physical abuse of a child. They knew about the actions to be taken on identification.

Also,67.9% knew about bite marks and how to examine bite marks in cases of child abuse and 32.1% were incognizant in examining bite marks. About 67.9% nurses knew that the court of law accepts the statement of dentist as an expert witness involving civil and criminal cases. Only 38.5% agreed that there is chance for facial reconstruction even if the facial structures are deteriorated. About 89.1% were willing to actively participate in workshops and seminars on forensic odontology (Graph-4). A total of 256 students were given a questionnaire in which Nursing Students had inadequate knowledge and awareness 47.7% and 43.6% compared to that of Nursing Staff 52.3% and 56.4% respectively.

Table no:2 - Distribution of male and female on basis of gender

Gender distribution				
		Frequency	Percent	Valid Percent	Cumulative Percent
	Male	30	19.2	19.2	19.2
	Female	226	80.8	80.8	100.0
	Total	256	100.0	100.0	

Table no:3 - Distribution of nursing students and staff on basis of designation

| Designation of participants				
		Frequency	Percent	Valid Percent	Cumulative Percent
	Nursing Staff	94	36.7	36.7	36.7
	Nursing Students	168	63.3	63.3	100.0
	Total	256	100.0	100.0	

STATISTICAL ANALYSIS:

Scoring was done for each question and average of the scores were calculated and those scoring above average were considered to have adequate knowledge, appropriate attitude and practice regarding forensic odontology.Data was entered in MS Excel and analysed using SPSS trial version 26. Paired T test was used to check the association between the parameters. Data was represented in tabular and graphical form. In present study, 74

nursing staff (52.3 %) and 104 nursing students (47.7%) had adequate knowledge about forensic odontology (Table 4 & Graph-2).

Graph no 2: Knowledge and Awareness regarding forensic odontology among nursing students and staff

Knowledge and Awareness regarding forensic odontology(Paired T test)

	nursing students	nursing staff
Knowledge	47.7%	52.3 %
Awareness	43.6%	56.4%
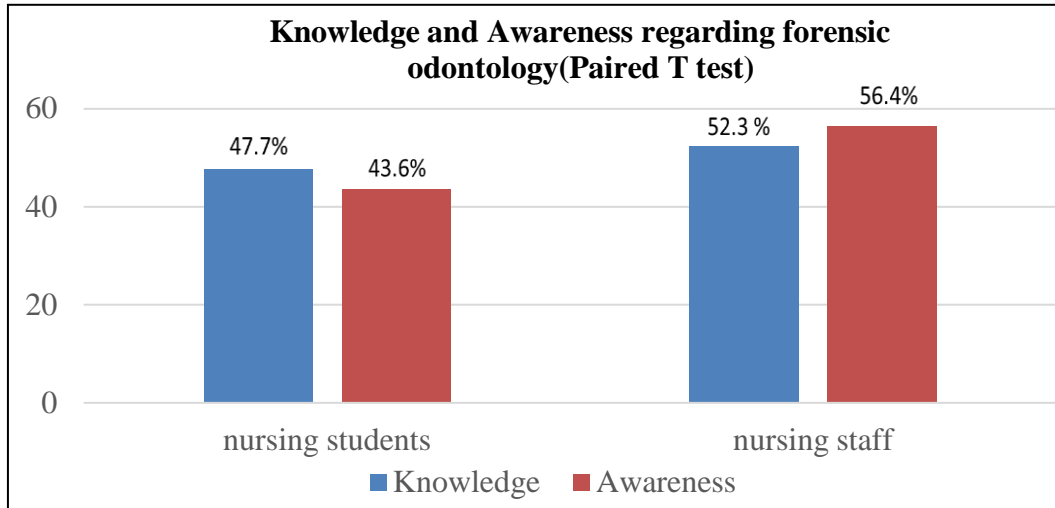
Graph no 3: Percentage score of question 4

- Yes — 21.2%
- No — 78.8%
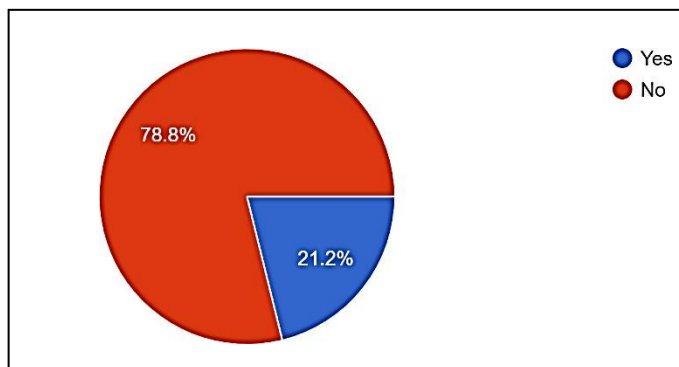
Graph no 4: Percentage score of question 26
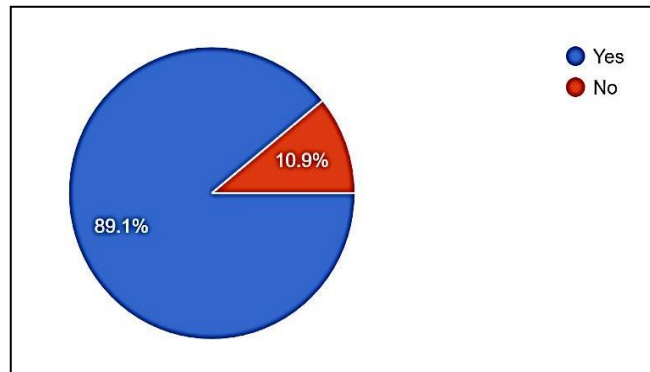
Table 4: - Distribution of nursing students and staff on basis of knowledge

		Adequate Knowledge(n)	Inadequate knowledge(n)
Designation	Nursing staff	74	20
	Nursing students	104	58

DISCUSSION:

Forensic odontology is an important branch of the study of dentistry that would assist in solving cases of abuses and deaths. Nurses are the backbone of health care profession. They go beyond the call of duty sometimes to save a life and sometimes just to comfort a patient. They do the real hands-on work. Forensic nursing is defined as application of the nursing process to public or legal proceedings[5]. Therefore, knowledge and awareness of forensic odontology among the nurses would assist in the flourishing field of dentistry.

It was observed that due to lack of trained assistants' forensic pathologists feel handicapped while performing the post-mortem examination and more time is wasted due to lack of such assistants. Preservation of viscera, clothes and trace evidences and other biological evidences get imped. Similar problems arise while dealing with poisoning cases, injury cases and sexual assault cases. Similarly, police officers while handling the dead body, destroy many valuable trace evidences and create many post-mortem artefacts. It is the lack of forensic knowledge which causes hindrances in successful prosecution of the cases[5].

In our study nursing staff had more knowledge compared to the nursing students as they had steered forensic cases and they had more experience in the field. Ranganthan et al (2014) conducted a survey among the Legal Professionals which concluded that the Lawyers aged above 40 years and lawyers had more than 20 years of experience had more knowledge on forensic odontology. The lawyers practicing in both civil and criminal cases were more aware of bite mark analysis which was in accordance to our study[7]. Also, Saima Sultan (2017) concluded that no knowledge and awareness about forensic odontology and child abuse amongst the lawyers which was contradictory to our study[8].

Sharma D et al (2018) performed a questionnaire survey to access knowledge and awareness of forensic odontology in Police officials of Ludhiana. They had sufficient knowledge about the role of FO in age estimation. About 68.8 % officers were aware of the fact that dental evidence plays a substantial role in the context of law[9]. While in our study, 66.7% of nurses agreed that the court of law accepts the statement of dentist as an expert witness involving civil and criminal cases. Also,74.4% of nurses agreed that forensic dentistry

helped in age estimation using teeth.

In this study, nursing students had inadequate knowledge and awareness (47.7% and 43.6%) compared to that of nursing staff (52.3% and 56.4%). To rule out knowledge and awareness about FO among Medical practitioners, Roy et al (2019) concluded that Practitioners with more than 15 years of practice had more knowledge about FO. But, practitioners with less than 15 years of experience had more awareness of modern FO techniques and procedures[10].

Present study depicted that 69.9% knew importance of maintaining dental records in identifying the deceased and crime suspects. About 59.9% of nursing students and staff agreed that they helped in maintaining dental records of patients. About 14.1% nurses had handled forensic dentistry related cases before. Jayalakshmi Kumaraswamy et al (2018) studied knowledge, attitude, and awareness of forensic odontology among medical students where (25%) had handled forensic dentistry case in emergency medicine and only 44% of participants were aware about the significance of maintaining dental records4. Mehrotra et al (2019) concluded that 69.5% dental practitioners had knowledge about the role of dentist in FO and 79% were willing to attend the CDEs on Forensics[11]. As in our study,89.1% nurses were interested to participate in workshops and seminars on forensic odontology.

The question arises why nurses should be aware of forensic odontology? Nurses are the first person to come in contact with the victims. They perform duties like collection and preservation of evidence, privacy assurance and support violation of human rights, providing comfort and psychosocial support to victims of violent crimes and their families, treating physical injuries that are admissible in court (e.g., victim's clothing, bullet(s), and other physical samples), assessment of alleged perpetrators and maintaining the data[12].

Forensic nursing is a unique specialty that blends the worlds of nursing, science, and the legal system. Forensic nurses bridge the gap between law and medicine. According to the International Association of Forensic Nurses (IAFN), forensic nurses do far more than address victims physical and emotional needs[13]. The role of a forensic nurse is to treat victims of crimes when they come to a hospital or other medical facility for care. Forensic nurses typically see patients who've undergone sexual assault, child abuse, domestic violence, or similar trauma. They deliver medical care and ensure that patients feel safe as they recover from trauma[14]. Nurses are being called the bulwark of healthcare profession becoming a strong connecting link between the victims and forensic odontologists. So, Forensic dental fieldwork requires an interdisciplinary knowledge of dental sciences too.

CONCLUSION:

A basic forensic odontology training program should be given to nursing students and staffs for assisting a dentist and legal professionals in presenting the proper evidence. They should be encouraged to attend regular seminars, workshops and conferences related to forensic odontology. All this could improve their knowledge and practical skills to handle forensic odontology related cases.

Conflicts of interest - There are no conflicts of interest

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