

## Original Article

# Evaluation of Knowledge, Attitude and Practice of Forensic Odontology among Undergraduate Dental Students

R Hannah, Pratibha Ramani, Anuja Natesan, Herald J Sherlin, Gheena S, Abilasha Ramasubramanian, Gifrina Jayaraj, K R Don, Archana S

Department of Oral and Maxillofacial Pathology, Saveetha Dental College, Chennai, Tamil Nadu, India

ABSTRACT

**Background:** Natural teeth are the most durable organs in human body. It helps in the identification of people in mass disasters, accidents, or where the victim's bodies cannot be recognized by visual methods. Forensic odontology is the proper handling, examination and evaluation of dental evidence, which will be then presented in the interest of justice. Through forensic odontology, a dentist plays a very important role in crime investigation of any type. **Aim:** The aim of this study was to evaluate the knowledge, attitude, and practice of forensic odontology among undergraduate dental students. **Materials and Methods:** This is a cross-sectional, institution-based survey conducted among 154 undergraduate dental students of age group 19–21 years. Simple random sampling was done. Each participant was given a questionnaire. The questionnaire consisted of a set of 15 questions. Both yes or no and multiple choice questions were present. The answers received were tabulated and statistically analyzed. **Results:** All the participants were aware of the branch in dentistry called forensic odontology. Eighty-two percent of the participants pointed their source of knowledge about forensic odontology to be from lecture and workshops in college. More than 80% of students had good knowledge about forensic odontology. Eighty-three percent of the participants were interested to undergo a formal training in forensic odontology. 89.6% of participants said that there is a good scope for forensic odontology as a profession. **Conclusion:** Forensic odontologist plays a major role in medicolegal cases, there is an urgent need to promote this specialty. The dental undergraduates need to be sensitized toward this specialty and encouraged to be part of investigation and identification teams. This can help establish forensic odontology as a separate specialty under dental sciences.

**KEYWORDS:** Crime, dental evidence, forensic odontology

Received: May, 2017.

Accepted: May, 2017.

## INTRODUCTION

In today's scenario, when crime rates are at peak, identification of the victim or the mode of crime is a tedious process. The dentist plays a small yet significant role in crime investigation through the specialty known as forensic odontology.<sup>[2]</sup> Forensic odontology is a subdiscipline of dental science which involves the relationship between dentistry and the law.<sup>[3]</sup> Forensic odontology defined by Keiser-Nielsen in 1968<sup>[1]</sup> as "that branch of forensic medicine which in the interest of justice deals with the proper handling and examination of dental evidence and with the proper evaluation and

presentation of the dental findings." Forensic odontology is an important component of modern-day investigations for the identification of people in mass disasters, accidents, or where the victim's bodies cannot be recognized by visual methods.

Although globally forensic odontology has taken giant steps in the technical advancements, in India, the field of forensic odontology is still miles behind in this

### Address for correspondence:

Dr. R Hannah, E-mail: [rgrace\\_89@yahoo.co.in](mailto:rgrace_89@yahoo.co.in)

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: [reprints@medknow.com](mailto:reprints@medknow.com)

**How to cite this article:** Hannah R, Ramani P, Natesan A, Sherlin HJ, Gheena S, Ramasubramanian A, *et al.* Evaluation of knowledge, attitude and practice of forensic odontology among undergraduate dental students. *Int J Orofac Biol* 2017;1:16-20.

### Access this article online

#### Quick Response Code:



Website: [www.ijofb.org](http://www.ijofb.org)

DOI: 10.4103/ijofb.ijofb\_7\_17

regard. There is increased need for dental surgeons to have good knowledge about forensic odontology as it is useful in the identification of an individual and to detect abuse among all ages.<sup>[4]</sup>

## MATERIALS AND METHODS

This is a cross-sectional institution-based study conducted among 154 undergraduate dental students. 154 undergraduate dental students of 2<sup>nd</sup> and 3<sup>rd</sup> year were included in the study. The age group was 19–21 years. Each participant was given a Questionnaire 1. The questionnaire consisted of a set of 15 questions. Both yes or no and multiple choice questions were present. The questionnaire was divided into three parts, knowledge about forensic odontology, attitude toward forensic odontology, and forensic odontology in their everyday practice. The questionnaire was customised based on previous published studies<sup>[2,4,7]</sup> The answers received were tabulated and statistically analyzed. The data received were categorized as nominal data.

## RESULTS

One hundred percent of the participants were aware of the branch in dentistry called forensic odontology and all the participants had forensic odontology as part of their curriculum.

### Knowledge about forensic odontology (Questions 3–8)

Eighty-two percent of the participants pointed their source of knowledge about forensic odontology to be from lecture and workshops in college, 11% from media, and 4% from newspapers [Figure 1].

Ninety-three percent of the participants were aware that a dentist can present dental records as evidence in court. Ninety-six percent were aware that forensic odontology can be used for identification in mass disaster. Eighty-eight percent were aware that teeth can serve as a source of DNA. Eighty-four percent were aware that sex determination can be done using barr bodies. Eighty-four percent were aware that sex determination can be done using barr bodies.

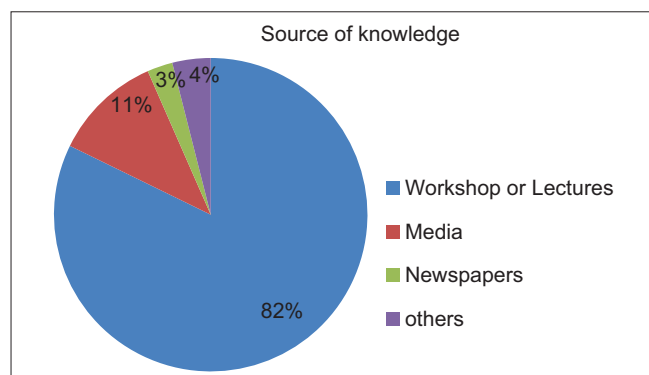


Figure 1: Source of knowledge

Seventy-nine percent were aware that enamel/dentin can act as an aid for identification of age [Figure 2].

### Attitude toward forensic odontology (Questions 9–11)

Only 41% of the participants thought that they had adequate knowledge in forensic odontology. Eighty-three percent of the participants were interested to undergo a formal training in forensic odontology. 89.6% of participants thought that there is a good scope for forensic odontology as a profession [Figure 3].

### Practice of forensic odontology (Questions 12–15)

Fifty-nine percent of the participants read forensic-related journals. Eighty-one percent of the participants maintain dental records of patients [Figure 4].

Forty-eight percent of participants preserve the case record of the patient, 27% the radiograph, 19% the photograph, and 6% the casts to be used as a dental record [Figure 5].

44.2% of the participants when they come across a child with signs and symptoms of abuse inform it to nongovernmental organizations (NGO), 33.8% inform to the police, and 22% inform to the parents [Figure 6].

## DISCUSSION

Forensic odontology is an important branch of the study of dentistry that would assist in solving cases and identifying victims of abuse and deaths. Greater knowledge and awareness of forensic odontology among the dental students would be required in the growing field of medicine.<sup>[2]</sup> The present study was undertaken to evaluate the knowledge, attitude, and practice of forensic odontology among the undergraduate dental students.

In this survey, the questionnaire designed consisted of 15 questions. The questions were divided into three sections to assess the participants (i) knowledge about forensic odontology, (ii) attitude toward forensic odontology, and (iii) practice of forensic odontology.

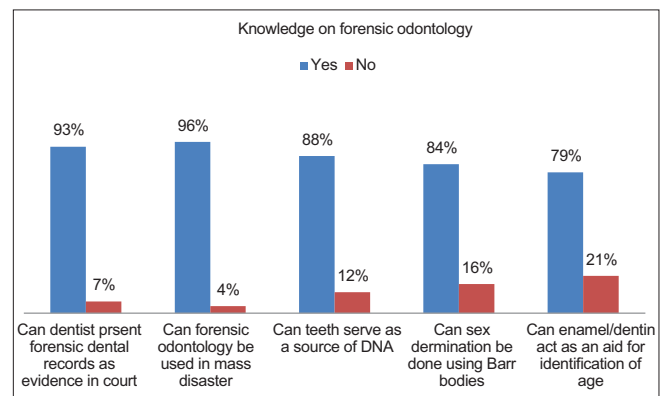


Figure 2: Knowledge on forensic odontology

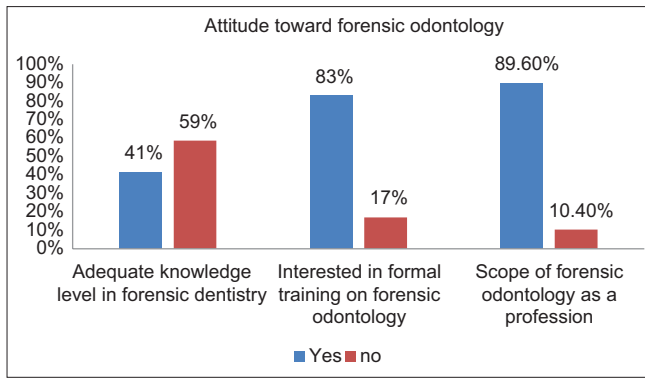


Figure 3: Attitude towards forensic odontology

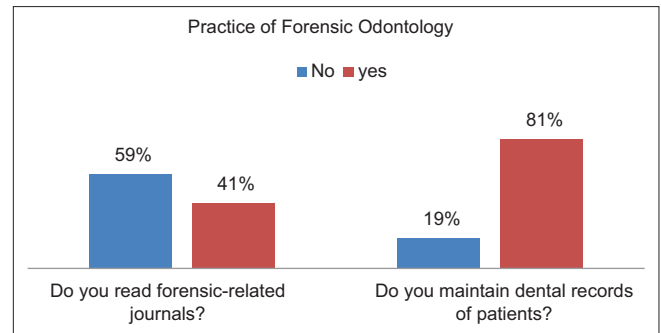


Figure 4: Practice of forensic odontology

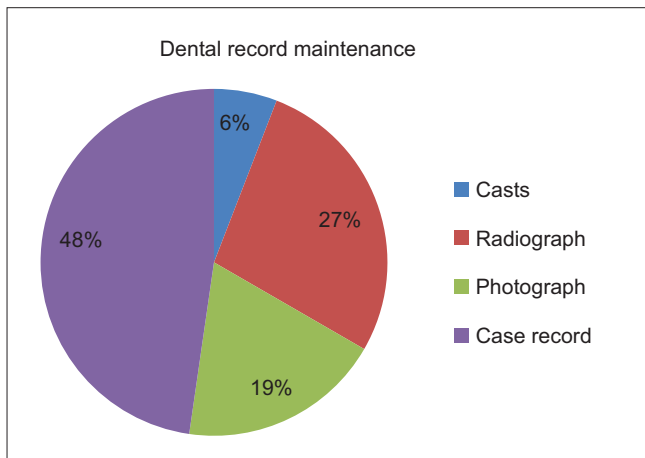


Figure 5: Dental record maintenance

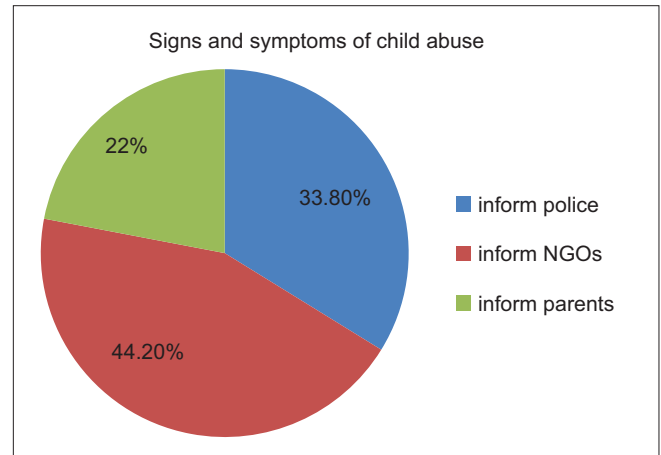


Figure 6: Signs and symptoms of child abuse

All the participants in the study were aware of the branch in dentistry called forensic odontology. Eighty-two percent of participants in this study gained knowledge about forensic odontology through the lectures and workshops in college. However, only 41% of the students think that the knowledge gained by them is adequate. Dental Council of India has included forensic odontology in the undergraduate curriculum, yet in most of the colleges, very few hours are dedicated to it. Considering the increase in the occurrence of accidents, crimes, and natural calamities, forensic odontology should be a separate subject at the undergraduate level itself. This will enable the BDS graduates to be well versed in this field of dentistry.<sup>[5]</sup>

In this study, 93% of the participants were aware that a dentist can present forensic dental records as evidence in court. Krishan *et al.* has suggested that forensic odontologists are involved in assisting the law enforcing agencies in proper presentation of the dental evidence collected from the scene of crime or mass fatality incidents. The dental evidence is compared with the antemortem records available to the dentists for identification of the deceased.<sup>[6]</sup>

Ninety-six percent of participants were aware that forensic odontology can be used for identification in mass disaster and 88% were aware that teeth can serve as a source of DNA. Dental tissues can withstand environmental assaults and still retain some of its original structure. This property of the teeth makes it as an excellent and an accurate source of DNA. Even a small amount of source material DNA can be amplified using polymerase chain reaction (PCR) technique, and this amplified DNA is then compared with antemortem samples, such as blood, hair, clothes, cervical smear, and biopsy.<sup>[7]</sup>

Eighty-four percent of the participants were aware that sex determination can be done using barr bodies. A more recent method of sex determination from teeth is the presence of sex chromatin or barr bodies in the pulp of the teeth, according to the method devised by Barr and Bertram. The studies have also been carried out to extract DNA from the pulp tissue as well as dentine and its use for sex determination using PCR.<sup>[6]</sup>

Seventy-nine percent were aware that enamel/dentin can act as an aid for identification of age. Tooth acts as a reliable tool in age estimation that is adopted by most of the anthropologists, archaeologists, and forensic odontologists. Histological measures of age estimation

mainly include incremental lines of enamel/dentin, neonatal lines, dentinal translucency, degree of formation of crown, and root. Incremental lines remain in the fossils and represent internal record and may serve as a valuable tool in age determination. Dentinal translucency is one of the morphohistological parameters considered best for dental age estimation not only in terms of accuracy but also in terms of simplicity.<sup>[8]</sup>

Eighty-one percent of the study population have said that they preserve the patient records and 48% of them preserve the case reports. Dentists should know not only the importance of preparing an accurate dental record but also the importance of preserving these records. These dental records serve the purpose of the future reference for their practice when needed and for medicolegal cases. As stated by the law, the records should be maintained for a minimum of 7 years to a maximum of 10 years for forensic purposes.<sup>[2]</sup>

Child abuse presents as a serious social problem with global dimensions, increasing at an alarming rate in all socioeconomic strata and in all ethnic or racial communities. All cases of child abuse that are greatly growing in number in day-to-day life should be detected as early as possible. 44.2% of the participants when they come across a child with signs and symptoms of abuse inform it to NGOs, 33.8% inform to the police, and 22% inform to the parents. In recent past, it has been observed that in many of the child abuse cases, parents have been found as the main culprit.<sup>[2]</sup>

This study helps us to come to a consensus that there is a good knowledge about forensic odontology among the undergraduate dental students. The students have good theoretical exposure in college. However, the students need to have more practical exposure to put this knowledge into practice. With crime rates at its maximum these days, the students can make a career in forensic odontology. This study also shows the need and

potential for forensic odontology to be considered as a separate specialty in dentistry.

## CONCLUSION

Forensic odontologist plays a major role in medicolegal cases, there is an urgent need to promote this specialty. The dental science graduates need to be sensitized toward this specialty and encouraged to be a part of investigation and identification teams. This can help establish forensic odontology as a separate specialty under dental sciences.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

1. Keiser-Nielsen S. Forensic odontology. *Int Dent J* 1968;18:668-83.
2. Sahni A, Rehani S, Mathias Y, Kardam P, Nagpal R, Kumari R. A questionnaire survey on forensic odontology: Are we really aware? *J Forensic Dent Sci* 2016;8:113.
3. Chidambaram R. Forensic odontology: A boon to community in medico-legal affairs. *JNMA J Nepal Med Assoc* 2016;54:46-54.
4. Preethi S, Einstein A, Sivapathasundharam B. Awareness of forensic odontology among dental practitioners in Chennai: A knowledge, attitude, practice study. *J Forensic Dent Sci* 2011;3:63-6.
5. Dinkar AD. Forensic odontology: Trends in India. *J Forensic Dent Sci* 2014;6:1-2.
6. Krishan K, Kanchan T, Garg AK. Dental evidence in forensic identification - An overview, methodology and present status. *Open Dent J* 2015;9:250-6.
7. Pretty IA, Sweet D. A look at forensic dentistry – Part 1: The role of teeth in the determination of human identity. *Br Dent J* 2001;190:359-66.
8. Saxena S, Sharma P, Gupta N. Experimental studies of forensic odontology to aid in the identification process. *J Forensic Dent Sci* 2010;2:69-76.

## Questionnaire 1

### Forensic Odontology

Age: \_\_\_\_\_ Sex: Male/Female \_\_\_\_\_ Year of study: \_\_\_\_\_

1. Are you aware of a branch in dentistry called forensic odontology?
  - a. Yes
  - b. No
2. Do you have “forensic odontology” as part of your curriculum?
  - a. Yes
  - b. No
3. What is the source of your knowledge about forensic odontology?
  - a. Workshops or lectures in college

- b. Media (internet, television etc.)
  - c. Newspapers
  - d. Others \_\_\_\_\_
4. Are you aware that a dentist can testify as an expert witness in court to present forensic dental evidence (dental records)?
    - a. Yes
    - b. No
  5. Do you think forensic odontology plays a role in mass disaster?
    - a. Yes
    - b. No
  6. Can teeth serve as a source of DNA?
    - a. Yes
    - b. No
    - c. Don't know
  7. Can sex determination can be done using barr bodies
    - a. Yes
    - b. No
  8. Can enamel/dentin act as an aid for the identification of age
    - a. Yes
    - b. No
  9. Do you think your knowledge level/awareness about forensic dentistry is adequate?
    - a. Yes
    - b. No
  10. Are you interested in formal training in forensic odontology?
    - a. Yes
    - b. No
  11. Do you think there is scope of forensic odontology as a profession?
    - a. Yes
    - b. No
  12. Do you read forensic dentistry related journals?
    - a. Yes
    - b. No
  13. Do you maintain the dental records of your patients?
    - a. Yes
    - b. No
  14. If yes, Which of the following are maintained?
    - a. Casts
    - b. Radiograph
    - c. Patient photograph
    - d. Case record of the patient
  15. What would you do if you identify signs and symptoms of child abuse?
    - a. Inform police
    - b. Inform nongovernmental organizations
    - c. Inform parents
    - d. Take no action