

Awareness of Forensic Odontology among Legal Professionals: An Institutional Study

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Abstract

Forensic odontology deals with victim identification and providing evidence in criminal cases by analyzing the dentition of deceased. Human dentition remains a vital tool for identification of the deceased individual. Forensic odontology has evolved as a new ray of hope but, this vital and integral field of forensic medicine is still in a state of infancy in India. Hence, the aim of this survey is to find the level of awareness and value of forensic odontology among the legal professionals. Questionnaire was conducted among the legal professionals in private institution in Chennai which comprised of 14 questions related to knowledge in forensic odontology, application of its technique, law pertaining to dentistry and in handling of forensic cases in their practice. From the present study, it is evident that there was lack of awareness on forensic odontology among legal professionals which reflects the current situation of our country.

Keywords: Forensic Science, Legal Professionals, Forensic odontology, Knowledge, Lawyers, Forensic medicine.

Introduction

In today's world, crimes are becoming more sophisticated. Hence a branch of science which deals with the improvement in method and procedures used in solving criminal cases is the need of the hour. Such a branch exists and it is termed as forensic medicine. Forensic medicine applies science and technology for the detection and investigation of crimes and the administration of justice. According to Keiser-Nielson, forensic odontology is a branch of forensic medicine that deals with the proper handling, examination and presentation of dental evidence in the best interest of

justice. [1] Their main aim includes identification of a dead individual by assessing, comparing their anti-mortem and post-mortem dental records, identifying the criminal after analysis of bitemarks on the victim's body and is being considered as a specialist in a court of law.

Forensic odontology is of utmost importance because teeth are considered as an important biological evidence due to their resistance to any type of damage. This along with the fact that every human dentition is morphologically unique improves their validity as a powerful evidence. Similarly, dental procedures done on a patient serve as a single biggest contributor for identification, as every dental procedure done in patient is unique, making it the key to enabling identification of the dead.[2],[3]

Dental identification has been a vital tool for identifying deceased individuals since 66 AD.[4],[5],[6] The first case that was accepted in a court of law was in the year 1849. Forensic odontology was very useful in identifying dead bodies of major historical figures like Adolf Hitler,[7] and Jai Chand.[8] Also it was used in providing evidence for the first time in the Indian history of criminal prosecution in India, leading to the death

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sentences of the accused in the infamous Delhi gang rape case.^[8] There are cases in which the victim's body is disfigured beyond recognition especially in cases of fires, automobile accidents and violent homicides. In these cases, human dentition remains a vital tool for identification of the deceased individual.

Recently, forensic odontology has evolved as a new ray of hope in assisting forensic medicine, but, this vital and integral field of forensic medicine is still in a state of infancy in India.^[9] This is because India lacks many institutions offering specialized training in forensic odontology. This leads to a decrease in job opportunities which leads to decrease in the scope of the field. Also, tampering of evidence at the crime scene, lack of proper equipment for analysis of the evidence collected and a general disregard for rules and protocols further push the field away from being in the mainstream.

In India, every legal professional has to have a major understanding of forensic odontology as this enables them to solve high profile cases with the co-ordination of a forensic odontologist. Therefore, the aim of this survey was to evaluate and analyze the level of awareness of forensic odontology among the legal professionals of private institution in Chennai, Tamil Nadu, India.

Materials and Method

Study design and participants: A pre-validated questionnaire was distributed to 34 lawyers in a private institution, Chennai. Both male and female lawyers were included in this study. The questions were framed to evaluate and analyze the level of awareness of forensic odontology among these lawyers. An informed consent was obtained from the participants before taking part in the survey.

Questionnaire design: The questionnaire had a set of 14 questions. The first part of the questionnaire consisted of the demographic's details including name, gender, age, specialty and work experience. The second part comprised of questions related to knowledge in forensic odontology, application of its technique, law pertaining to dentistry and in handling of forensic cases in their practice. The questions on knowledge on forensic odontology included whether or not they were aware of forensic odontology, whether the lawyers knew that forensic odontology was a part of forensic medicine, whether forensic dentistry play a role in victim/deceased and criminal identification in criminal and civil cases, whether teeth can be used as a tool of identification,

whether gender determination can be done with the help of teeth & facial bones and whether age estimation in children can be done by examining teeth. The application of forensic odontological techniques includes DNA analysis with the help of the tooth, bitemark analysis, lip print analysis and rugae analysis. The data was collected, analysed manually and graphs were plotted according to the result gained.

Questionnaire:

1. Have you heard of the term forensic odontology? (Yes/No)
2. Forensic odontology/dentistry is a branch of forensic medicine? (Yes/No)
3. Does Forensic dentistry play a role in victim/deceased & criminal identification in criminal and civil cases? (Yes/No)
4. Have you encountered any cases involving forensic odontology? (Yes/No)
5. Do you know that teeth can be used as a tool of identification? (Yes/No)
6. Gender determination can be done with the help of teeth & facial bones? (Yes/No)
7. Can age estimation in children be done by examining teeth? (Yes/No)
8. Can teeth serve as a source of DNA? (Yes/No)
9. Do you think bite marks analysis can be used for assessing a criminal scene? (Yes/No)
10. Are you aware of lip print analysis? (Yes/No)
11. Are you aware of rugae analysis? (Yes/No)
12. Does the court of law accept the statement of dentist as an expert witness involving civil and criminal cases? (Yes/No)
13. Dental jurisprudence is the application of principles of law to practice of dentistry (Yes/No)
14. Loss or fracture of tooth is a grievous injury under IPC 320 clause 7 (5) (Yes/No)

Result

A total of 34 individuals participated in the study and the response rate was 100%. The study group comprised of lawyers in the age group between 23-68 years. Males comprised 32% while females comprised of 68% of the total. Lawyers between the second and

third decade of age comprised of 56%, between the third and fourth decade of age comprised of 18% and more than fourth decade accounted for 26%. Depending on the field of specialty, 3% were in criminal law, 18% in civil law, 71% in both criminal and civil law and 9% had

a specialty in other fields of law. The practitioners with less than 10 years of experience included in the study were 71% while 29% practitioners included in the study had more than 10 years of experience (Figure 1).

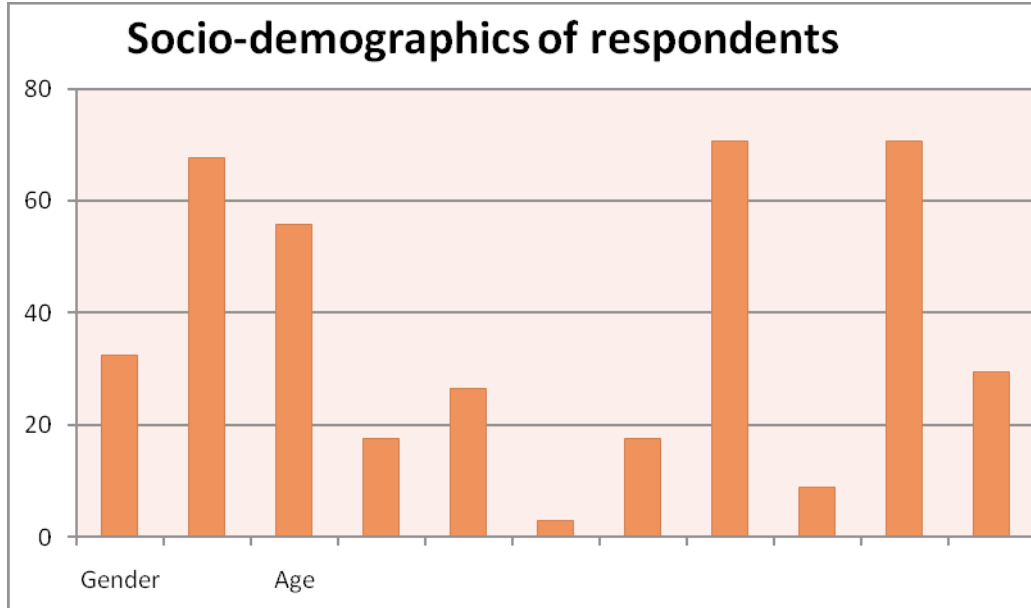


Figure 1: Socio-demographics of respondents

Lawyers aged between the second and third decade had more knowledge regarding forensic odontology as a part of forensic medicine, handled cases, understood teeth as a tool for identification, bite mark analysis and

lip print analysis when compared with those lawyers between 30-40 years and lawyers aged more than 40 years. Among the lawyers above fourth decade of age, 7.7% of them were aware of rugae analysis (Figure 2).

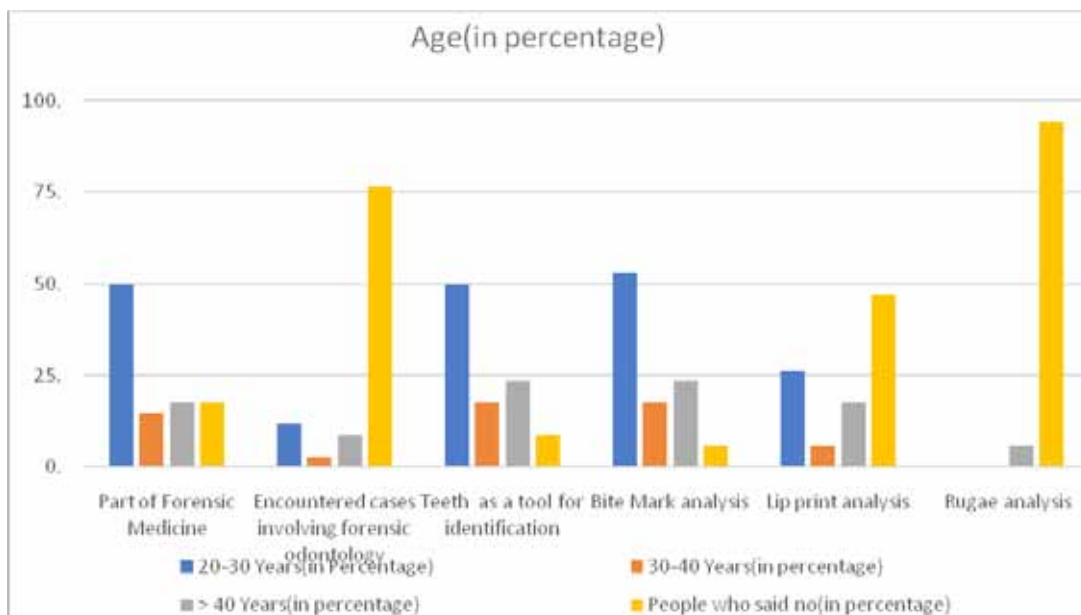


Figure 2: Awareness of forensic odontology related to Age

Awareness of knowledge about the term forensic odontology, role of forensic odontology in criminal or deceased identification, teeth as a tool of identification,

gender determination with teeth & facial bones and teeth as a tool for age estimation was more among the female lawyers in the study (Figure 3).

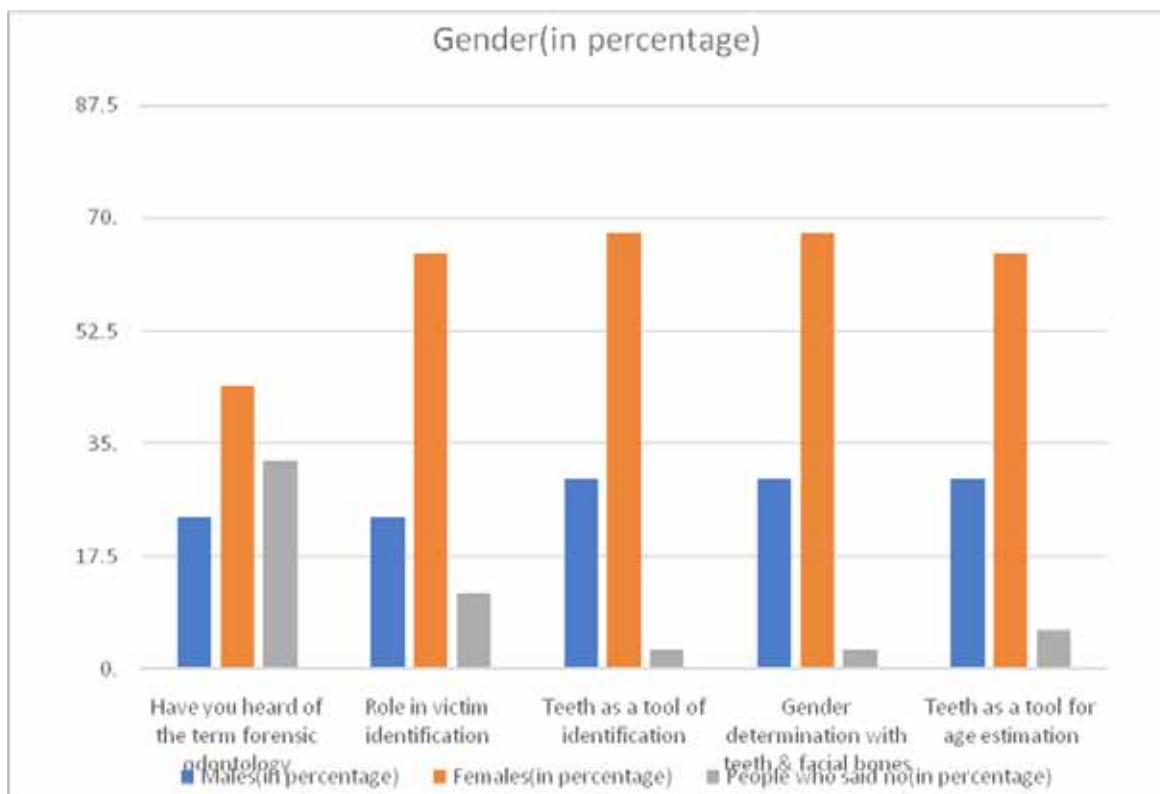


Figure 3: Awareness of forensic odontology related to gender

Lawyers, who had less than 10 years of experience, had more knowledge regarding forensic odontology as a part of forensic medicine, role in criminal/victim deceased identification, teeth as a tool for identification, gender determination using teeth and facial bones and teeth as a tool for age estimation. They even had more

knowledge regarding the availability of DNA from teeth. Equal number of lawyers with more than 10 years of experience and less than 10 years of experience have dealt with cases involving forensic odontology. (Figure 4).

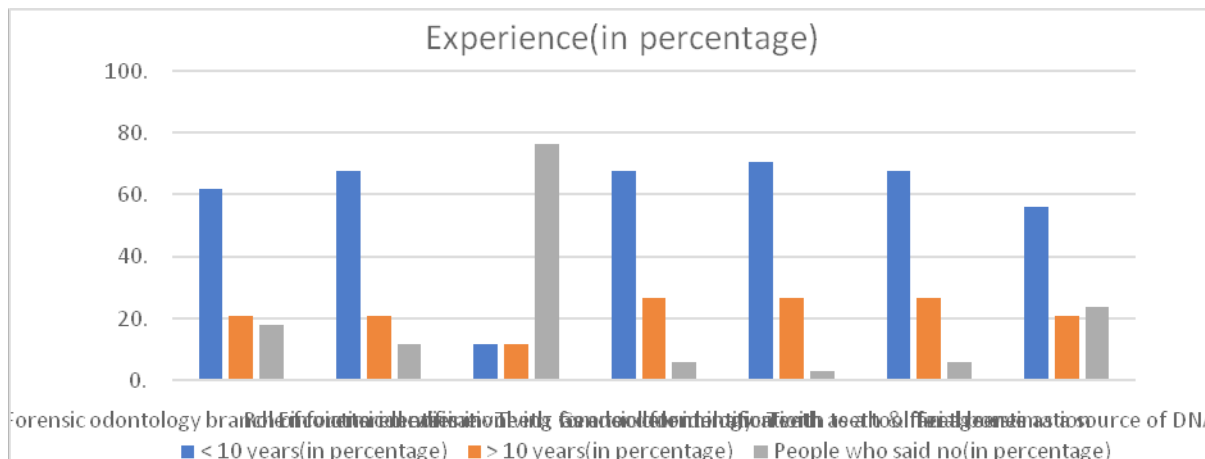


Figure 4: Awareness of forensic odontology related to Experience

The lawyers practicing in both civil and criminal cases were more aware of bite mark, lip print analysis, rugae analysis, dentist as expert witness in a court of

law, dental jurisprudence and loss or fracture of tooth is a grievous injury under IPC clause 7 (5). (Figure 5).

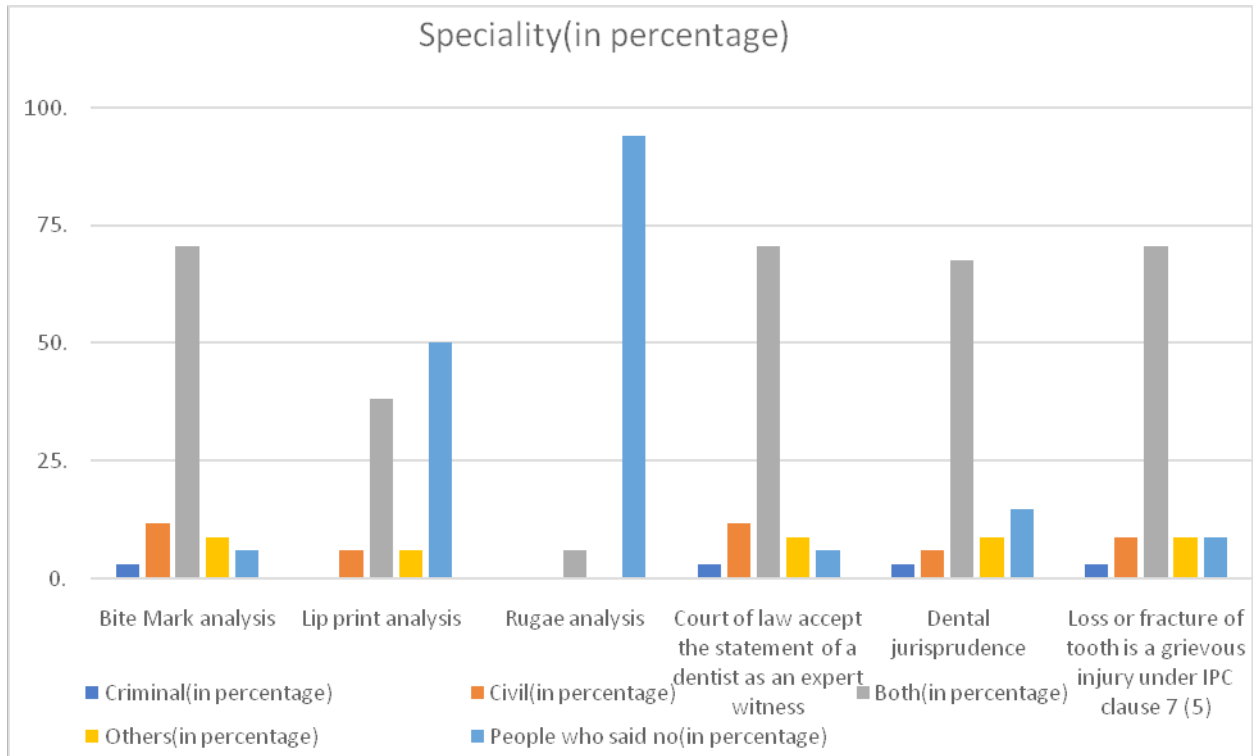


Figure 5: Awareness of forensic odontology related to Specialty

Discussion

Forensic odontology has a key role in identification of persons in mass disasters for example, aviation, earthquakes or tsunamis, crime investigations and identification of decomposed and disfigured bodies like that of drowned persons, fire victims and victims of motor vehicle accidents.^{[10],[11]} Forensic odontologists play a significant role through the examination of anatomical structures, dental appliances and dental restorations. Teeth and the associated structures have a major role in forensics, from 66AD to the current cases.^[4] Forensic odontology has been gaining recognition in the world in a rapid momentum but its growth is still stagnant in India.

Although we are well prepared to deal with our patients’ medical needs, we are less aware of their forensic and legal needs. Often these additional aspects of patient care are overlooked. Of note is that “their legal issues” may ultimately become “our legal issues.” A consequence of inadequate preparation to deal with

forensic issues is that many physicians are intimidated by them. Such intimidation can lead to avoidance, which confounds the problem. Common misperceptions do little to help the situation.^[12]

It is necessary for a lawyer to have the knowledge required for dealing with cases involving forensic sciences as investigations play a very important role in any criminal case. In our present study, 97% knew about estimation of age and 94% knew about gender determination using teeth and facial bones. A similar study done by Selvajothi *et.al* showed that 91% lawyers knew about estimation of age and 76% knew about gender determination.^[11] Another study done by Bhaskar *et.al* showed that majority of the advocates were aware of bite mark analysis in all the groups of years of experience which increased with increase in years of experience with almost 66% of the advocates with 35-41 years of experience. Advocates with the superlative years of experience were furthermore aware of both rugae and lip mark analysis when equated to the other groups.^[13]

Similarly, dentists also have the responsibility of knowing about the subject in detail. A study done by Almutairi *et.al* showed that dentists had high level of knowledge on most of the important aspects of forensic dentistry, which are investigations of physical violence, estimation of individuals' age and bite-mark analyses but dentists had knowledge deficiencies that were mainly related to the significance of forensic odontology on other aspects such gender discrimination and child-neglect investigations.^[14] According to a study done by Avon *et.al*, a forensic dentistry plays a major role in identification of those individuals who cannot be identified visually or other means. The unique nature of our dental anatomy and the placement of custom restorations ensure accuracy when the techniques are correctly employed.^[15]

Lawyers in the second to third decade of age, who were specialized in both criminal and civil law were aware of bite mark analysis. Lawyers in the second to third decade of their age and who were specialized in both criminal and civil law were aware of lip print analysis. Only lawyers in the second to third decade of their age, who were specialized in both criminal and civil law were aware of rugae analysis. Lawyers having experience below 10 years of age were aware that teeth can be used as a source of DNA.

Legal professionals who lack knowledge of forensic odontology will be unable to competently assess and handle scientific evidence and hence the pursuit of justice can be seriously hampered potentially, leading to factual errors.^[16] Currently, the law curriculum does not include forensic odontology as a subject. Just the basic knowledge of forensic odontology to lawyers can be beneficial to them for solving cases independently regarding this subject.

Conclusion

From the present study, it is evident that there was lack of awareness on forensic odontology among legal professionals which reflects the current situation of our country. A sound basic knowledge on forensic odontology and its applications in the court of law is mandatory for legal professionals to provide unbiased justice.

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Références

1. Keiser-Nielsen S. Forensic odontology. *Int Dent J*. 1968; 18:668-83.
2. Rathod V, Desai V, Pundir S, Dixit S, Chandraker R. Role of forensic dentistry for dental practitioners: A comprehensive study. *J Forensic Dent Sci*. 2017;9:108-9.
3. Furness J. A general review of bite-mark evidence. *Am J Forensic Med Pathol*. 1981;2:49-52.
4. Chandra Shekar BR, Reddy CV. Role of dentist in person identification. *Indian J Dent Res* 2009;20:356-60.
5. Rahman J, Routray S, Mishra SS, Mohanty I, Mohanty N, Sukla N. Knowledge, awareness and practice of forensic odontology among dental surgeons in Bhubaneswar, India. *J Unexplored Med Data* 2017;2:26-33.
6. 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.
7. Riaud X (2014) Dental Identifications of Adolf Hitler and Eva Braun. *J Dent Probl Solut* 1(1): 006-010.
8. Balachander N, Babu NA, Jimson S, Priyadharsini C, Masthan KM. Evolution of forensic odontology: An overview. *J Pharm Bioallied Sci*. 2015;7(Suppl 1):S176-80.
9. Bagi BS. Role of forensic odontology in medicine. *J Indian Dent Assoc*. 1977;49:359-63.
10. Kavitha B, Einstein A, Sivapathasundharam B, Saraswathi TR. Limitations in forensic odontology. *J Forensic Dent Sci*. 2009; 1:1.
11. Selvajothi P, Lavanya C, Joshua E, Rao UK, Ranganathan K. Awareness of forensic odontology among legal professionals, Chennai, India. *N Am J Med Sci*. 2014;6:553-7.
12. Ryan MT. Clinical forensic medicine. *Ann Emerg Med*. September 2000;36:271-273.
13. Bhaskar, Varsha & V Bharathwaj, V & Manipal, Sunayana & Prabu, D and Rajmohan & A H Harini, Priya. (2018). An Insight into the Forensic Cognizance among advocates. 16-22.

14. Adel F. Almutairi, Bayan A. Alkhtheri, Hattan N. Aleidan, Asma A. Alhabib, Eid A. Alotaibi, Mahmoud Salam. Examining the perceived versus the actual knowledge about forensic odontology: A cross-sectional survey among dentists. *Clin Exp Dent Res*. 2018 Dec; 4(6): 297–304.
15. Avon SL. Forensic odontology: The roles and responsibilities of the dentist. *J Can Dent Assoc*. 2004;70:453-8.
16. McCartney C, Cassella J. When science doesn't meet the law: Addressing the absence of forensic skills in law degrees. *New Dir*. 2008;4:1-4.