NANGARHAR UNIVERSITY
INTERNATIONAL JOURNAL OF BIOSCIENCES
ORIGINAL ARTICLE
e-ISSN: 2957-9988
NUIJB Vol 4, Issue 2 | 2025

Received: 22 Apr 2025 Accepted after revision: 24 Jun 2025 Published Online: 30 Jun 2025

Assessing the Professional Knowledge of Dentists about the Importance of Forensic Dentistry: A Survey-Based Study

Seraj Palwasha[1*], Tawana Shegofa[2], Anwari Mohammad Taqi[1], and Alemi Ehsanullah[1]

1Department of Forensic Medicine, Faculty of Stomatology, Kabul University of Medical Science, Kabul, Afghanistan
2Department of Endodontics and Operative Dentistry, Faculty of Stomatology, Kabul University of Medical Science, Kabul, Afghanistan
Corresponding author email: palwashaseraj@gmail.com

ABSTRACT

The most common application of forensic odontology, a crucial and essential component of forensic science, is the identification of both living and deceased individuals. Although this field has developed in many parts of the world, it is still at a very early stage in Afghanistan. There are no formal studies or training programs for dentists regarding forensic dentistry. This study aims to evaluate the understanding of forensic dentistry among dentists in Kabul. A descriptive cross-sectional survey was conducted in June 2024 among doctors at the Ali Abad Dentistry Teaching Hospital and the Stomatology National Curative and Specialized Hospital in Kabul, Afghanistan. A convenience sampling method was used to choose the participants. A descriptive cross-sectional survey was conducted between June and July 2024, among dentists of two governmental dental hospitals (Ali Abad stomatology Teaching Hospital and the Stomatology National Curative and Specialized Hospital) in Kabul, Afghanistan. Participants were selected using a convenience sampling method and the sample compromised dental practitioner from both hospitals. The collected data were entered and analyzed using Microsoft Excel. The questionnaire was distributed to 119 doctors; a total of 64 doctors returned the completed forms (response rate 53.7%). When asked whether forensic dentistry is a branch of dentistry, 55 dentists (89.5%) responded affirmatively. Regarding the accuracy of age estimation based on tooth eruption, 54.6% of participants thought it to be moderately accurate. A majority (78.1%) agreed that bite marks can play a role in establishing identity. This study revealed that dentists in these two governmental dental hospitals possess a limited overall understanding and awareness of forensic dentistry. Although the majority of participants acknowledged the importance of forensic dentistry in age estimation and medico-legal investigations.

Keywords: Dentists, Forensic Dentistry, Knowledge, Survey

INTRODUCTION

The most common application of forensic odontology, a crucial and essential component of forensic science, is the identification of both living and deceased individuals. In recent years, forensic odontology has gained recognition as supportive tool in forensic medicine (Chandra Shekar and Reddy 2009). According to the Australian Society of Forensic Odontology, it is defined as the application of dental science as evidence Whitin the legal context, involving the identification, documentation, interpretation, and presentation of dental evidence for use in judicial proceedings (Al-Azri, Harford, and James 2016).

Forensic dentistry serves both civil and criminal purposes and encompasses four main areas of interest: bite mark analysis, dental identification, cheiloscopy (lip print analysis) and palatoscopy (palatal rugae analysis). A major application is the identification of human remains through dental records, which plays a significance role in legal investigations and disaster victim identification. The Australian Dental Association recognizes forensic dentistry as one of the 13 specialties within dentistry. Forensic odontologists play a significance role in serving society, particularly in identifying unknown individuals. In modern societies, personal identification holds significance

importance for financial, legal and social purposes, and it also enables families to identify and honor their deceased loved ones according to cultural customs (Abdul et al. 2019).

Studies conducted in neighboring and regional countries reported varying levels of awareness regarding forensic dentistry among dental practitioners. For instance, a study conducted in Pakistan, reported that 86.2% of dentists acknowledged the importance of forensic dentistry, and 88.7% recognized the importance of maintaining dental records to assist forensic specialists. However, despite high level of awareness only 64.5% of dentists reported actually maintaining proper dental records. (Akram et al. 2019). Likewise, a study carried out in India, found that 12% of dental practitioners kept complete dental records, while 21% kept none. Moreover, 41% were unaware of age estimation methods based on dentition, and 18% did not recognize the forensic importance of bite marks (Preethi, Einstein, and Sivapathasundharam 2011).

In Saudi Arabia, a study indicated that 75% of graduates and 40.9% of students were aware that teeth can serve as a source of DNA, and 95% knew that forensic dentistry plays a role in criminal and death investigations. However, more than 83% of participants admitted to having insufficient knowledge about the field (Abdul et al. 2019). Another Indian study indicated that 86.4% of dentists were aware of dental impressions, while 13.6% were not (Ram 2022). Furthermore, Iyer and Santhanam indicated that judges aged between 20–30 years had greater awareness of forensic dentistry compared to older age groups, and professionals with less than 10 years of experience exhibited higher levels of knowledge (Iyer and Santhanam 2020). In another study conducted in Australia, dentists indicated reasonable level of awareness regarding forensic odontology (Al-Azri, Harford, and James 2016). In a similar study that has been conducted in Cyprus found that the majority of staff members and undergraduate students showed knowledge of forensic odontology (Giannakopoulos, Lambrou-Christodoulou, and Kaklamanos 2024).

Given the lack of prior study in Afghanistan, this study intends to evaluate the dentists' knowledge in two governmental dental hospitals in Kabul, Afghanistan.

MATERIALS AND METHODS

A descriptive cross-sectional survey was conducted between June and July 2024, among dentists of two governmental A dental hospital (Ali Abad stomatology Teaching Hospital and the Stomatology National Curative and Specialized Hospital) in Kabul, Afghanistan. Participants were selected using a convenience sampling method and the sample compromised dental practitioner from both hospitals. Sample size was calculated to be 119, using the Raosoft sample size calculator, assuming a 5% margin of errors, a confidence interval of 95%, a population size of 170, and a response distribution of 50%. Data were collected using a structured and slightly modified questionnaire adopted from previous studies (Sahni et al. 2016; Navya and Raj 2016) The questionnaire consisted of two sections: the first captured demographic details, while the second included 11 questions assessing participants' knowledge of forensic dentistry. The collected data were entered into Microsoft Excel and analyzed using descriptive statistical methods. including frequencies and percentages, to describe participants' responses, which were presented in tabular format. Ethical approval was obtained from the research and ethics committee of Kabul University of medical science (KUMS) (protocol no 62 – 1402/9/22) before starting the study. All participants were asked for their informed consent and were given a brief overview of study's objectives and anticipated outcome of the study.

RESULTS

A total of 64 dental practitioners from two governmental dental hospital participated in this study. which, 31 (48.4 %) were female and 33(51.6%) were male.

The questionnaire was distributed to 119 dentists, of whom 64 returned completed forms, resulting in a response rate of 53.7%. The remaining were excluded due to various reasons such as lack of cooperation from participants, incomplete responses or failure to return the questionnaire. among the respondents, 48% were affiliated with the Ali Abad Dentistry Teaching Hospital while 52% were from the National Curative and specialized stomatology Hospital. The majority of participants (53%) were under age of 30. Whereas only 9.3% were over the age of 50. A total of 64 dental practitioners from two governmental dental hospital participated in this study. Regarding clinical experience, approximately 6.3% of participants indicated having less than one year, 42.2 of participants reported having between 3 to 4 years, 23.4% had between 5-10 years and 28.1% had more than ten years of experience, as presented in table 1. Most of the participants were residents (45.3%), and 21.8% were specialists; general practitioners were also among the participants (Table 1).

Notably, nearly all participants (98.4%) expressed a willingness to attend an awareness conference on forensic dentistry. When asked whether forensic dentistry is a branch of dentistry, the majority of participants (89.5%) responded "yes." A small portion (12.5%) responded negatively and only 1.5% were uncertain, selecting "maybe.". in terms of perceptions regarding the accuracy of age estimation based on tooth eruption, 54.6% of participants considerate it moderately accurate, while 40.6% viewed it highly accurate, and only 4.6% believed this method to be of low accuracy. it to have low accuracy.

Significant portion of participants (98.4%) agreed that forensic dentistry plays an important role in investigating cases of medical negligence, indicating a strong recognition of its legal and clinical relevance. When asked whether teeth can serve as a source for DNA sampling, 54.6% of participants responded affirmatively, as shown in figure 2.

In terms of familiarity with the term "forensic dentistry," 42 participants (65.6%) reported having heard of it, while 34.3% had not. In the current research on self-evaluated professional

knowledge in this area, 39% of dentists stated they felt adequately knowledgeable in forensic dentistry, while 53.1% indicated that they did not. Additionally, 1.5% of dental practitioner indicated having little knowledge, and 6.25% did not give a reply. These findings highlight a general awareness of the field. A majority of participants (78.1%) agreed that bite marks can contribute to establishing identity, while 3.1% disagreed and 19.6% responded with "maybe. "in our study, when questioned about the scientific term for the study of lip prints, 37.5% correctly identified it as cheiloscopy (figure 2). Among the 47 participants who operated private dental clinics, 70.2% reported maintaining dental records, while 29.4% did not. Furthermore 68.7% of dentists demonstrated awareness of the role forensic dentistry plays in the identification of victims during mass disasters (Figure 3).

Table (1) Demographic characteristics of the participants in the study .

Sex	
Male	**33 (51.6)**
Female	**31 (48.4)**
clinical experience in years	
Less than one year	4(6.3%)
3-4 years	27(42.2%)
5-10 years	15(23.4%)
Above 10 years	18(28.1%)
Profession	
General practitioner	21(32.8)
Trainee dentist	29(45.3%)
Specialist	14(21.9%)
Age	
Less than 30 years' old	34 (53.1%)
30–40 years' old	16 (25%)
40-50 years' old	8 (12.5%)
More than 50 years old	6 (9.4%)

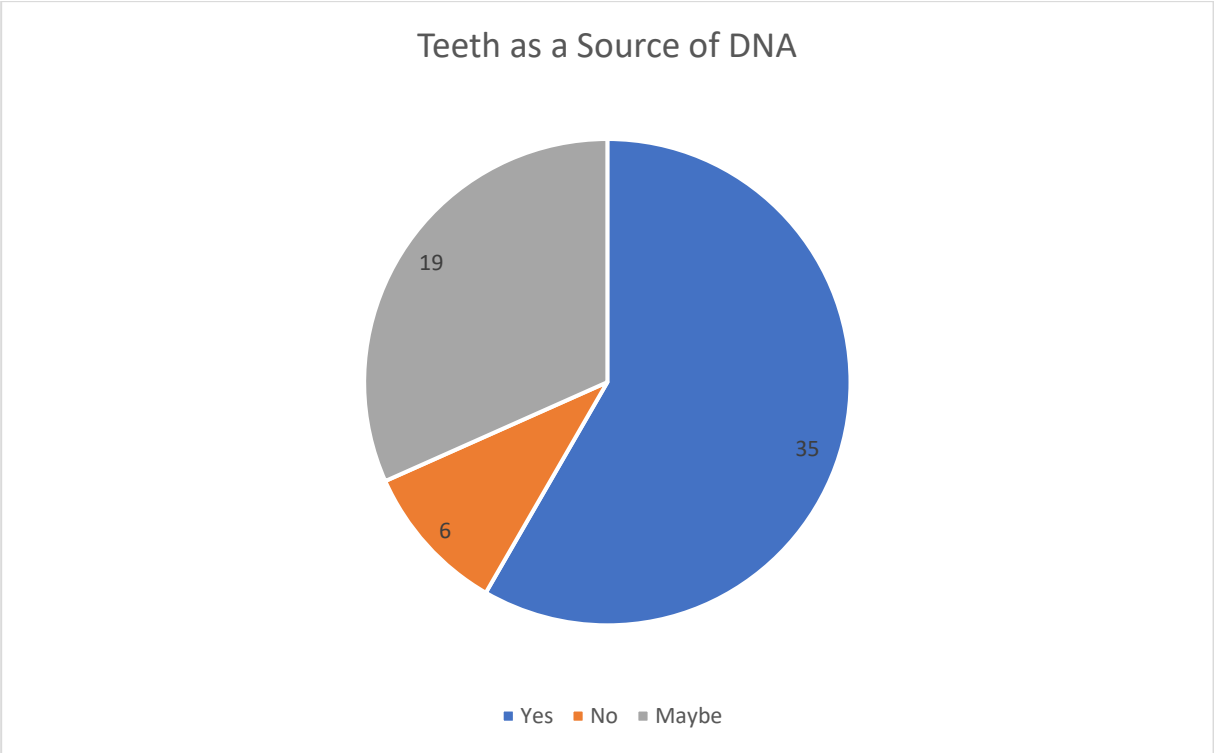

Figure (1) Teeth as a source of DNA.

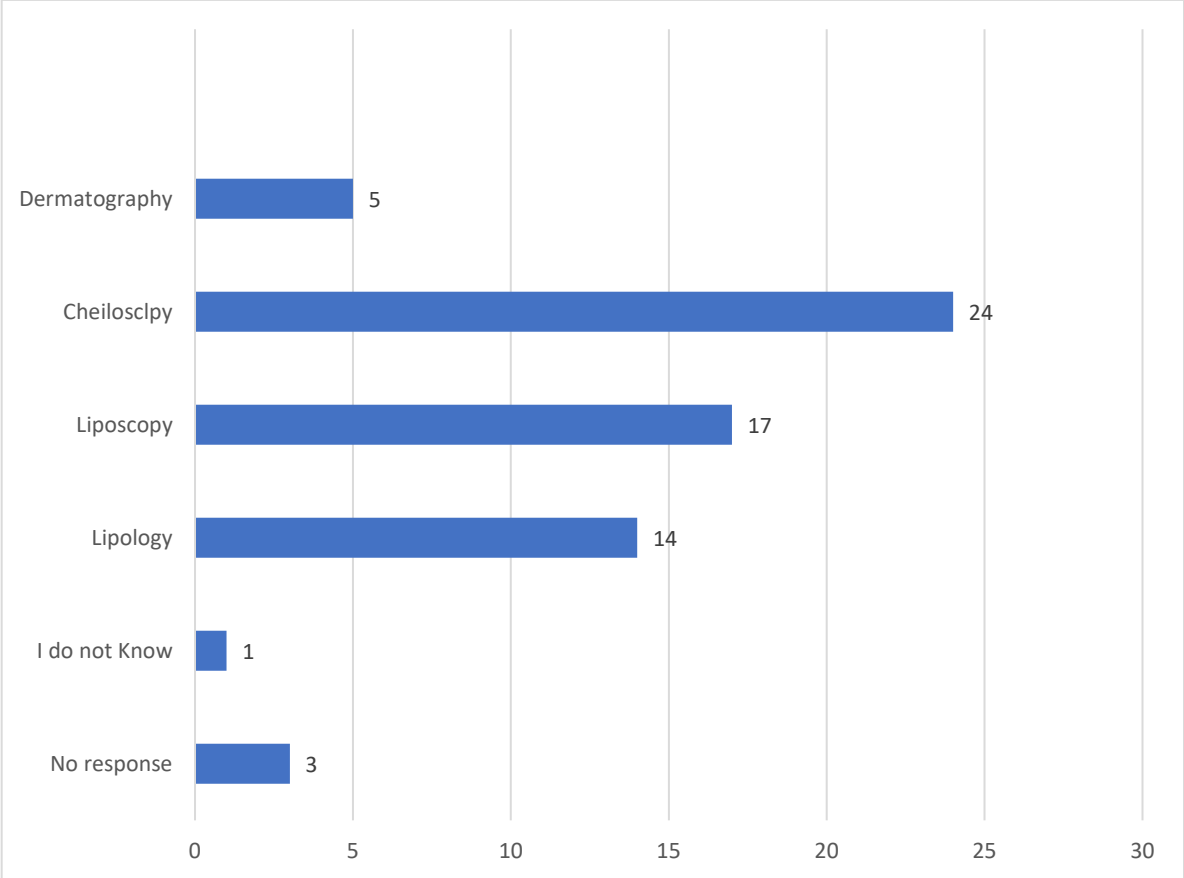

Figure (2) Response to the scientific name for lip printing study

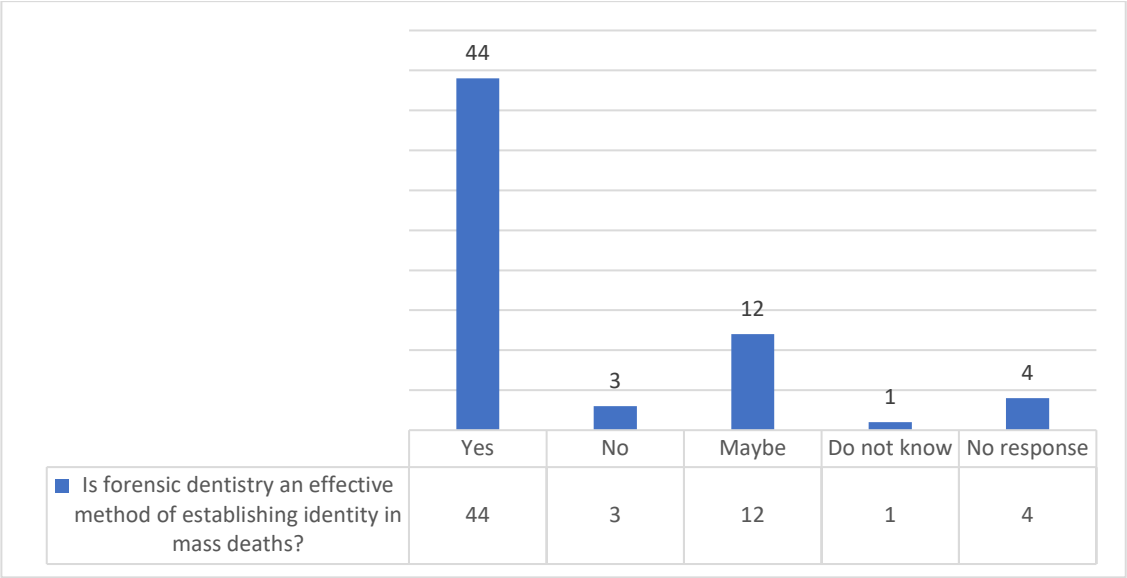

Figure (3) The role of forensic dentistry in establishing identity in mass deaths

Discussion

This study conducted to assess the professional knowledge of doctors regarding forensic dentistry, revealed that 53.1% of participants reported insufficient knowledge in this field, this finding is consistent with a study conducted by Preethi et al. in India. Suggesting a shared underlying cause, namely the lack of formal education in forensic odontology Whitin dental curricula. Furthermore, when participants were asked about the potential of teeth as a source for DNA, 57.3% of participants responded positively, while a similar study in India reported limited awareness on this topic, with most participants indicated that their knowledge was primarily acquired through social media platforms rather than formal education. (Preethi, Einstein, and Sivapathasundharam 2011), in contrast to the Indian study, participants in the current study reported having acquired their knowledge through university-based forensic medicine lectures. This suggests a higher level of formal education in forensic odontology. Moreover, 68.7% of dentists showed knowledge of forensic dentistry role in personal identification, which is relatively similar to a study conducted in Saudi Arabia, which reported 77.5%. (Abdul et al. 2019). A possible explanation for slight difference in knowledge levels between this study and the Saudi Arabian study may be attributed to the lower response rate observed in the present research. With respect to the awareness of the significance of bite marks in forensic identification 78.1% of the participants in this study acknowledged their importance, a finding consistent with the results reported by Preethi et al. where 78% of respondents demonstrated similar awareness. This consistency suggests a broadly shared understanding of the forensic value of bite mark analysis across different study populations. (Preethi, Einstein, and Sivapathasundharam 2011). Regarding the study of lip prints, only 37.4% of participants in this study were aware of the correct term(chelioscopy), which contrast with the findings of a study conducted by Nagarajappa et al., where 71.4% of dentists demonstrated awareness. (Nagarajappa R et al. 2014). The significant difference may be attributed to the limited practical applications and exposure of forensic dentistry in Afghanistan. In this study 40.6% of participants believed that age estimation based on tooth eruption was highly accurate. In contrast, a study conducted in India reported that 97% of respondents agreed on the accuracy of age determination using dental evidence. This disparity suggests a potential gap in training awareness regarding forensic methods among dental practitioners in Afghanistan (Iyer and Santhanam 2020). In terms of dental record maintenance, 51.5% of participants reported that they maintain dental records. In contrast, a study conducted in india reported a significantly higher rate, with 97.5% of participants indicating they kept dental records. (Smeha R. Sharma, Freny R. Karjodkar, Kaustubh P. Sansare, Mohd Saalim, Amkit H. Sharma 2021). This significant difference may be attributed to the absence of specific legal regulations in Afghanistan requiring doctors to maintain patients record for medico-legal purposes. Regarding the lip print study, this study found that 37.5% of participants were aware of it. which is lower than a study conducted in Pakistan reported that 49% of participants were aware of the term (Tahir et al. 2022). 67.8% of the participants believed in the role of forensic dentistry for identification purposes, which is relatively similar to a study conducted in India (Shree, Jeevanandan, and Govindaraju 2022); in both countries,

this level of awareness could be attributed to exposure to medial sources that highlight the role of forensic dentistry in identification process. In regard to forensic odontology as a branch of dentistry, 89.5% of the participants recognized the term, while in research conducted in Saudi Arabia, indicated that only 53% of the participants were familiar with the term (Alamoudi and Alghamdi 2024); the discrepancy might be attributed to the relatively low sample size in our study. However, in a limited number of countries worldwide, forensic dentistry has been formally integrated into the dental curriculum, for instance, in India, it was incorporated into Bachelor of Dental Surgery program in the state of Gujarat in 2007 and later proposed as a subject in postgraduate programs to the Dental Council of India in 2009 (Navya and Raj 2016),while in Afghanistan, forensic dentistry recently has been introduced into the curriculum in Afghanistan . The low response rate represents a limitation of this study; however, as the first survey conducted in this field, it serves as a preliminary investigation that highlights the need for more comprehensive research in the future.

ETHICAL ASPECTS

Ethical approval was obtained from the research and ethics committee of Kabul University of medical science (KUMS) (protocol no 62 – 1402/9/22) before starting the study.

CONCLUSION

This study revealed that dentists in these two governmental dental hospitals possess a limited overall understanding and awareness of forensic dentistry. Although the majority of participants acknowledged the importance of forensic dentistry in age estimation and medico-legal investigations, there were significant knowledge gaps were identified in certain areas, such as cheiloscopy and maintenance of dental record.

CONFLICT OF INTEREST

The authors claim no conflict of interest.

FUNDING

This research received no funding.

References

Abdul, NishathSayed et al. 2019. 'Awareness of Forensic Odontology among Undergraduate, Graduate, and Postgraduate Dental Students in Riyadh, Saudi Arabia: A Knowledge-, Attitude-, and Practice-Based Study'. *Journal of Forensic Dental Sciences* 11(1): 35.

Akram, Saima, Zaeem Arif, Shoaib Khan, and Sanam Tauheed. 2019. 'Knowledge, Awareness and Practice of Forensic Odontology Among Dental Practitioners in Karachi, Pakistan'. *The Pakistan Journal of Medicine and Dentistry* 8(1): 4.

Al-Azri, Abdul Rahman, J. Harford, and H. James. 2016. 'Awareness of Forensic Odontology among Dentists in Australia: Are They Keeping Forensically Valuable Dental Records?' *Australian Dental Journal* 61(1): 102–8.

Alamoudi and Alghamdi. 2024. 'Awareness of Forensic Dentistry among Dental Professionals in Western Saudi Arabia A Knowledge, Attitude, and Practice-Based Cross-Sectional Study'.

Chandra Shekar, B. R., and C. V.K. Reddy. 2009. 'Role of Dentist in Person Identification'. *Indian Journal of Dental Research* 20(3): 356–60.

Giannakopoulos, Kostis, Persefoni Lambrou-Christodoulou, and Eleftherios G. Kaklamanos. 2024. 'Awareness of Forensic Odontology among Dental Students and Faculty in Cyprus: A Survey-Based Study'. *Dentistry Journal* 12(1): 1–15.

Iyer, Prabhav Kumar, and Archana Santhanam. 2020. 'Awareness of Forensic Odontology among Legal Professionals: An Institutional Study'. *Medico-Legal Update* 20(2): 141–47.

Nagarajappa R et al. 2014. 'Awareness of Forensic Odontology awareness of forensic odontology among dental practitioners in kanpur city, india: a kap study'. *J Dent Res Updates* 1(1): 6–12.

Navya, N, and JamesD Raj. 2016. 'To Assess the Knowledge and Attitude toward Forensic Odontology among Dentists in Chennai City'. *International Journal of Forensic Odontology* 1(1): 17.

Preethi, S, A Einstein, and B Sivapathasundharam. 2011. 'Awareness of Forensic Odontology among Dental Practitioners in Chennai: A Knowledge, Attitude, Practice Study'. *Journal of Forensic Dental Sciences* 3(2): 63.

Ram, Ashwin Jaikumar. 2022. 'Awareness about Forensic Dentistry among the Dental Students in Chennai - A Hospital Based Survey'. *Journal of Pharmaceutical Negative Results* 13(SO4): 1–4.

Sahni, Ankita et al. 2016. 'A Questionnaire Survey on Forensic Odontology: Are We Really Aware?' *Journal of Forensic Dental Sciences* 8(2): 113.

Shree, M. Kavya, Ganesh Jeevanandan, and Lavanya Govindaraju. 2022. 'Knowledge and Awareness of Forensic Dentistry Course among Undergraduates'. *Journal of Advanced Pharmaceutical Technology and Research* 13(6): 447–52.

Smeha R. Sharma, Freny R. Karjodkar, Kaustubh P. Sansare, Mohd Saalim, Amkit H. Sharma,

Samiksha A. Chavan. 2021. ‘Awareness Towards Forensic Dentistry - A Questionnaire - Based Cross - Sectional Study’. : 385–90.

Tahir, Fizza et al. 2022. ‘Awareness of Forensic Odontology among Dentists in Pakistan and Its Impact on Dental Record Keeping’. *Pakistan Journal of Medical and Health Sciences* 16(8): 92–95.