Original article

Awareness of and Practices Related to Forensic Dentistry Among Libyan Dentists

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ABSTRACT

Objectives: Given that Libya has recently become a hot spot of armed conflicts, this study aims to investigate Libyan dentists' awareness of practices related to forensic dentistry, to inform public health policy and dental education curriculum.
Methods: A paper-based, self-administered questionnaire survey was conducted among Libyan dentists working in Benghazi between January and April 2017. The sample frame comprised all government and private dental practices in the city. The questionnaire required information on respondents' demographic and professional characteristics, sources of information, attitude, practices, and barriers related to forensic dentistry. Collected data were analyzed using SPSS software.
Results: Out of 250 questionnaires distributed, 200 were returned and used for analysis. More than half of the respondents were males (51%), and few of them worked in both private and public sectors (4.5% and 6%), and almost all of them were Libyans. Although most heard about it, only a small proportion (13%) received forensic dentistry education. A few numbers of the respondents (8) reported handling forensic cases. Around a third of participants indicated keeping some form of patient records. However, only (13.5%) of participants agreed that keeping patients' records is essential, and about (9.5%) of them disagreed. In addition, more than half of the participants (65.5%) claimed that they believe that keeping such records is essential, but they are not able to.
Conclusion: Despite a positive attitude towards and awareness of the importance of forensic dentistry, more educational and practice enabling efforts are needed to support the humanitarian role of dentists in conflict-affected environments such as Libya.

Keywords: *Awareness, forensic dentistry, survey, Libya.*

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INTRODUCTION

Forensic odontology is a branch of dentistry that deals with the proper handling and examination of dental evidence and the proper evaluation and presentation of dental findings in the interest of justice[1]. Forensic odontology's primary value is identifying human remains based on the individualistic characteristics present in the teeth of different individuals. Forensic dentists should be included in the National Emergency Management Agency; an entirely created Identification Commission with two exceptionally qualified forensic dentists in each unit of identification following international standards is desirable [2, 3]. Disaster Victim Identification is the name given to

identifying disaster victims (DVI). Teeth are the most substantial portion of the human body, capable of withstanding tremendous explosion levels while remaining unharmed[4, 5]. In mass fatality instances where other means of identification, such as fingerprints and facial features, have been obliterated, teeth are more likely to be recovered.

Several previous studies showed that Forensic dentistry plays a significant role in identifying those individuals who cannot be identified visually or by other means. The unique nature of our dental anatomy and the placement of custom restorations ensure accuracy when the techniques are correctly employed[5]. According to studies, the dental examination has also been a helpful technique in identifying the deceased. Preparedness is the cornerstone to a successful mass disaster identification. Therefore, forensic dentists should be included in the National Emergency Management Agency; an entirely created Identification Commission with two exceptionally qualified forensic dentists in each unit of identification following international standards is desirable[6]. Victims' identification is of paramount importance and a fundamental right for their families at war times. Although forensic dentistry may offer a way for this, the issue remains that its success relies on the accuracy and availability of antemortem dental records. Given that Libya has recently become a hot spot of armed conflicts[7], this study investigates Libyan dentists' awareness of and practices related to forensic dentistry to inform public health policy and dental education curriculum.

METHODS

A cross-sectional study design was conducted using a paper-based questionnaire in Benghazi between January and April 2017. The study population were dentists working in the city of Benghazi in the private and public health sectors. No precise list of dentists was available, and hence, a convenience sampling technique was employed to recruit study participants. However, sampling was conducted to allow the recruitment of a sample representative of different generations and types of practices in the Libyan dental practice. The dentists were approached in clinics by the principal investigator, who explained the aim of the study and obtained verbal consent to participate in the study.

A self-administered questionnaire was designed explicitly for this study. In addition, it was informed by available literature on forensic dentistry awareness and knowledge among dentists [8-10]. The question format and questionnaire layout were refined over an extensive discussion with the supervisor. A close-ended structure as yes/no, questions was used. A free-text response section was included at the beginning of the questionnaire to collect sociodemographic information. The questionnaire was pre-tested for clarity and content validity among a purposeful sample of 20 experienced dentists and demonstrators at the faculty of dentistry, University of Benghazi. The participants in the questionnaire piloting process were not included in the final sample.

The questionnaire was handed in person to the dentists and collected after two days from the clinics' reception. First, the collected questionnaires were checked for completeness, where participants' answers were examined for inconsistencies across questions and contingency questions [11]. For example, a questionnaire with all answers as 'yes' or all answers as 'no' was excluded. In addition, questionnaires with completely missing information were excluded. The questionnaires were then uploaded on an excel sheet, and numbered codes were given to each answer. For example, code one was given to the answer 'yes' and code two was given to the answer 'no'.

Data were analyzed using statistical software SPSS Version 22.0. (Armonk, NY: IBM Corp.). Descriptive statistics were used to describe the demographics and professional characteristics of the participants, the characteristics of their dental practices and their current carrier position according to years of experience (Counts and percentages were used to summarise responses to closed-ended questions and categorized answers of choices and experiences questions.

RESULTS

Out of 250 questionnaires distributed, 200 dentists returned complete questionnaires suitable for data analysis. The sociodemographic characteristics of the study sample are summarised in table 1. More than half of the respondents were males (102, 51%), and few of them worked in both private and public sectors (12, 6%), and almost all of them were Libyans.

Table 1: Sociodemographic characteristics of the study sample (n=200)

Variable		N	%
Gender	Male	102	51.0
	Female	98	49.0
Country of Graduation	India	1	0.5
	Libya	199	99.5
Attended postgraduate study program	no	191	95.5
	yes	9	4.5
Type of practice	government	93	46.5
	both	12	6.0
	private	95	47.5

Figure 1 describes the participants in terms of providing clinical information and handling any forensic dentistry related case. It shows that most of the participants (183, 91.5%) reported that they had never been asked to provide clinical information in a forensic case, and most of them (192, 96%) reported that they had never handled any forensic dentistry related case. Figure 2 describes beliefs and attitudes towards forensic dental evidence. The majority of the participants (162, 81%) believed that gender could be determined by teeth help, and dentistry plays a role in victim identification (186, 93%). Figure 3 describes the participants according to their knowledge and practices. More than half of the participants (106, 53%) knew about bite mark patterns of teeth, and (74, 37%) of them maintain dental records in their clinic. Radiographs were the most maintained record (62, 31%). Figure 4 describes the attitude towards keeping patient records is essential or not. It shows that most participants do not know or disagree that keeping records is essential, and (49, 24.5%) of participants agreed that keeping patient records is not their responsibility. In addition, more than half of the participants (131, 65.5%) claimed that they believe that keeping such records is essential, but they are not able to.

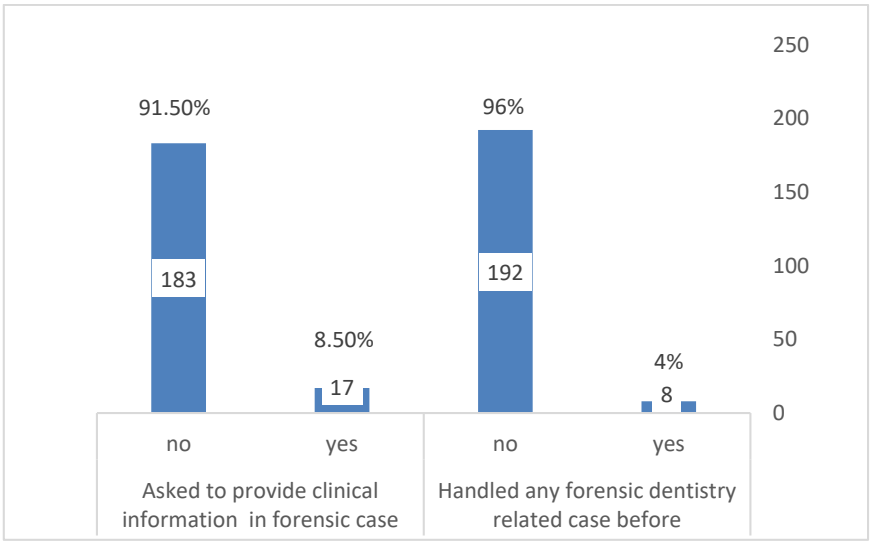

Figure 1: Previous experience with forensic dentistry

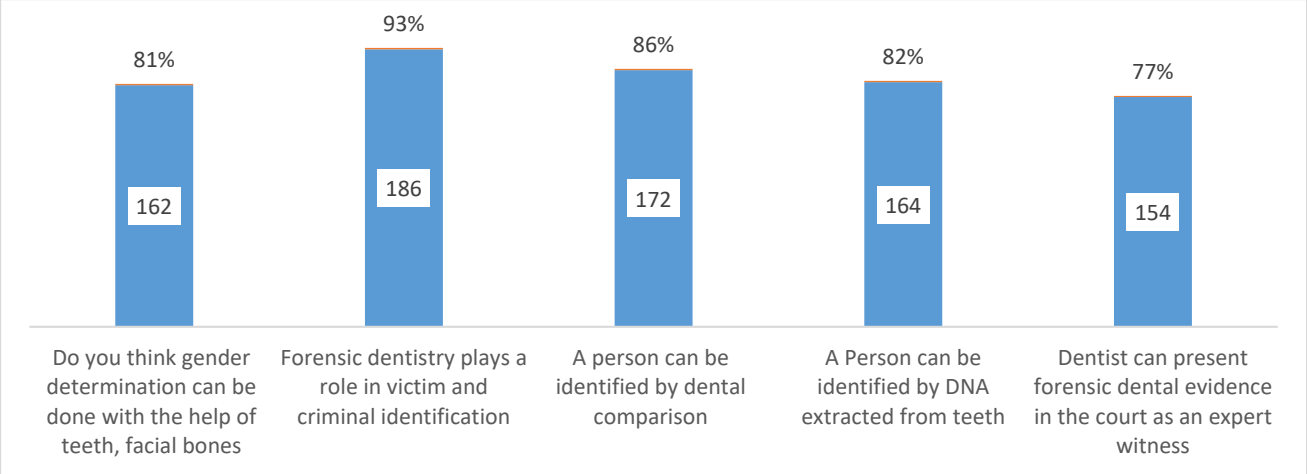

Figure 2: Beliefs and attitudes towards forensic dentistry

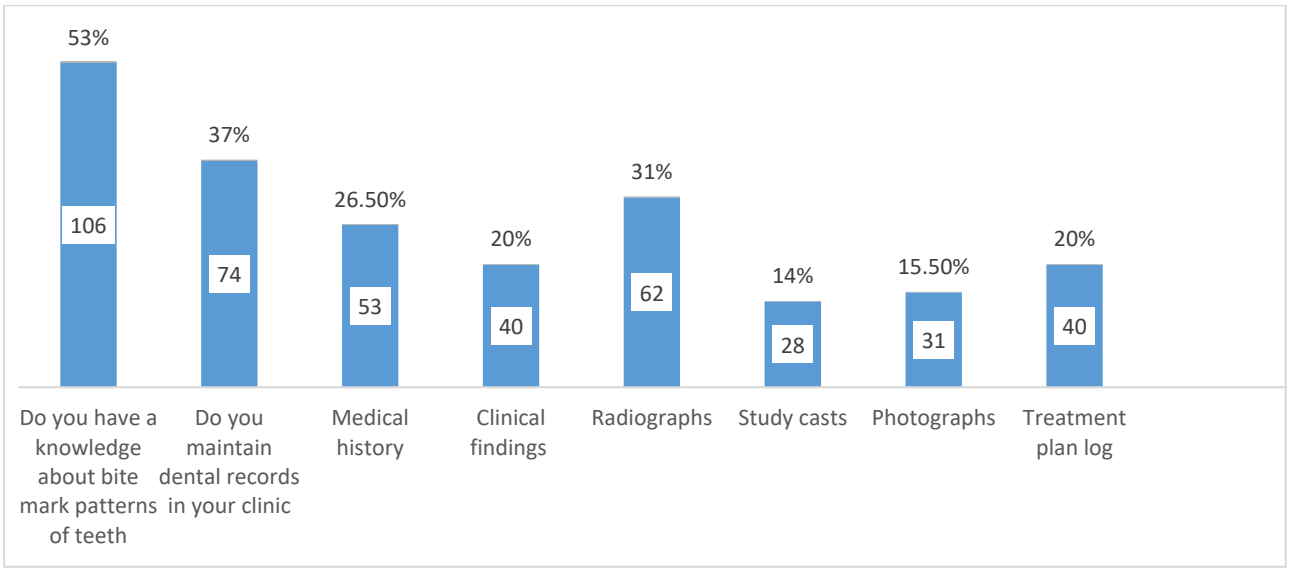

Figure 3: practices related to forensic dentistry

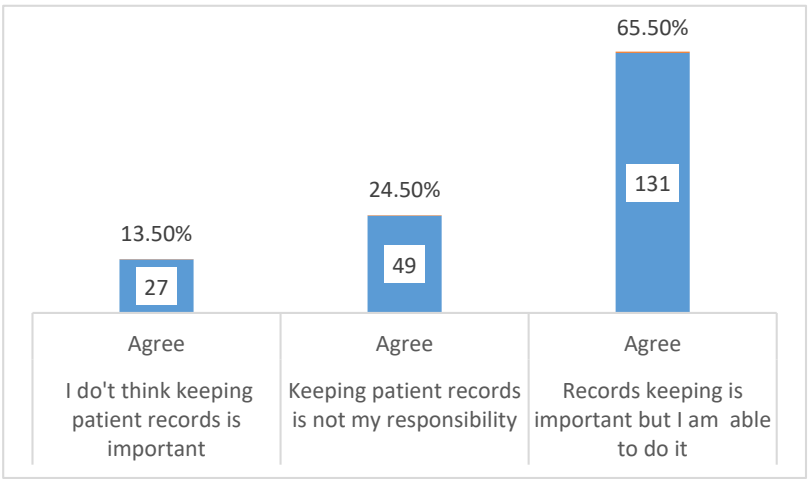

Figure 4: attitude toward record keeping

Figure 5 describes the participants' reasoning why they are not keeping patient records. It shows that almost half of participants (84, 42%) claimed that they do not keep patient records due to a lack of computer facilities in their clinic, and (75, 37.5%) of participants claimed that the reason is lack of storage space, while (67, 33.5%) stated that they have never been trained on keeping records, and (62, 31%) of them stated that they have no authority in their workplace. Additionally, lack of time was the excuse of (48, 24%) of the participants for not keeping patient records.

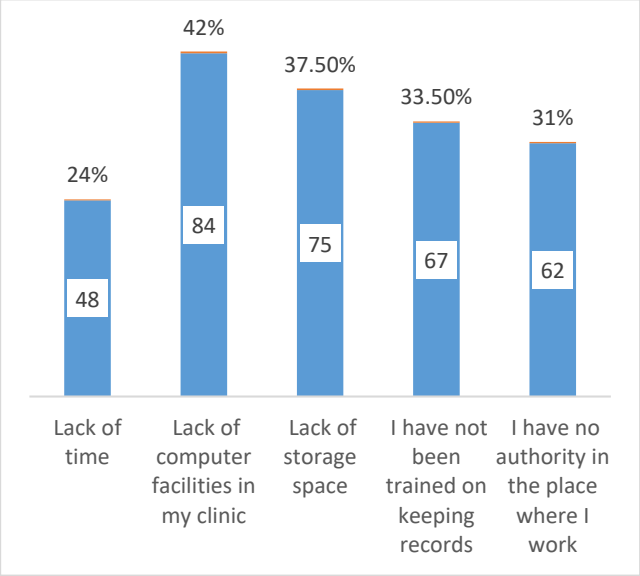

Figure 5: Barrier to appropriate record-keeping

DISCUSSION:

To the authors' best knowledge, this is the first study to assess the awareness of forensic dentistry among Libyan dentists. The topic has become increasingly important in the light of recent political changes in the country, which went through several civil wars and turmoil. The present study showed that most participants have never been asked to provide or handed forensic dentistry-related information, though the majority considered dental sciences necessary in forensic practices. These findings raise important questions about why dentists were not involved in forensic activities. While we see this as a future research area, it could be the case that forensic dentistry as a new branch of dentistry is not well known to the legal authorities in Libya. in addition, there is no such speciality in the dental education and health care systems in Libya, unlike forensic medicine. A previous study in Brazil demonstrated that the reduced number of teaching hours and lack of teachers in forensic odontology represent the primary factor in maintaining dental records for forensic purposes[12]. Therefore, efforts to raise awareness about the importance of forensic dentistry and its role should be disseminated at different educational and political levels.

The participants in the present study demonstrated varying levels of knowledge and practices related to forensic dentistry. While (106, 53%) knew about biting marks, around (31, 15.5%) kept photographs and study casts. These findings highlight that big dental data used for forensic dentistry are missing from daily dental practice, and further efforts are required to improve these practices in the Libyan setting. Most participants agree that keeping such records is essential, but they reported being unable to do so. They attributed this to several reasons: lack of time, training, storage place, or authority in their dental clinics. Similar findings have been reported in Australia, where dentists indicated no interest in keeping accurate and complete forensic odontology records due to lack of time and high load level with busy dental practices[12]. In 2007, Delattre and his team conducted a study to test the attitude and practices of forensic dentists in Belgium, and they found that young male dentists used the most appropriate records to keep forensic data, but the interest in continuing to keep complete and accurate records decreased with increasing practitioner age[12]. Waleed et al. (2015), have compared the recorded data by the dentists in dental hospitals during their undergraduate study to their records later where they worked in private clinics and showed that the records were more appropriate and based on the medico-legal purposes with a high awareness level during the time of learning in general hospitals than the dentists in private clinics[13].

These findings have important implications for health care planners and educators. The dental curriculum should include training on records keeping as an essential part of the dental practice, supported by rules and guidelines developed by health authorities since dental records can confirm personal identity in forensic studies[14]. Finally, in line with previous studies, although the respondents demonstrated appreciation of the vital role of keeping dental records in dental practices to support forensic work, there was adequate exposure to forensic odontology during their undergraduate study[15].

In Croatia, forensic odontology was introduced as a mandatory course in undergraduate programs in 1997, establishing the Chair of Forensic Dentistry at the School of Dental Medicine, University of Zagreb. It was later introduced in postgraduate programs and continuing professional education. Throughout

the course, participants are introduced to the legal obligations of record-keeping (informed consent, diagnosis, treatment plan, recording treatment) and the importance and application of documentation in dental identification and use in forensic expertise and litigation related to negligence, malpractice, and the qualification of orofacial injury[16].

The International Organization for Forensic Odonto-Stomatology (IOFOS) investigated undergraduate education in forensic odontology and found that a specific teaching course in forensic odontology is neither mandatory nor elective in most undergraduate programs[17]. At the same time, the profile and competencies of the graduating European dentist include the Professionalism domain, composed of ethics, regulation, and professional behavior[18], which are covered in an introductory forensic odontology course. However, the issue remains that forensic dentistry is not one of the usual tasks of general dental practitioners, who are usually confronted by practice and patient-related barriers that hinder their practice of appropriate dental care[19].

The present study has some limitations which should be addressed here. First, the study used a cross-sectional design, which can provide descriptive data with limited application in cause and effect relationships. However, the study aimed to describe the current situation of forensic dentistry in Libya as baseline data. Second, the study used self-reported questionnaires, which can risk recall bias and social desirability bias. However, questionnaires are suitable for such types of studies, and the researchers have made efforts to minimize such biases. Finally, there was no complete list of dentists in Benghazi, and hence, the sample was convenient.

CONCLUSION

Despite a positive attitude towards and awareness of the importance of forensic dentistry, the practice of forensic dentistry is hindered by limited abilities, education, and facilities. More educational and practice enabling efforts are needed to support the humanitarian role of dentists in conflict-affected environments such as Libya.

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