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Original Research Article

Awareness and Compliance about Forensic Odontology among Dentists in Dental Colleges of Davangere City, Karnataka, India

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Abstract

Introduction: Forensic dentistry is a challenging and fascinating branch of forensic science that involves the application of dental sciences in the identification of deceased individuals through the comparison of ante- and postmortem records. 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.

Aims and Objectives: The aim of the study is to analyze the awareness and compliance of forensic odontology among dentists in Davangere.

Materials and Methods: A cross-sectional study was conducted in a sample of 200 dental practitioners in Davangere and data was collected by means of a questionnaire. The questionnaire consisted of 12 relevant questions with demographic data. Chi Square test, descriptive statistics and regression analysis was done to analyze the data using SPSS v21.

Results: This present study showed that only 49.5% of the participants had a part of forensic dentistry in their curriculum. The present study revealed that 88.5% of the participants were aware of the importance of maintaining dental records. 82% of the dental practitioners did not know how to estimate the dental age and gender by examining the teeth. 86.5% of dental practitioners had no formal training in collecting, evaluating and presenting dental evidence. 75% of the practicing dentists in this study never practiced forensic odontology.

Conclusion: Forensic Odontology is a still in the infancy stage in India, but, can touch the sky if proper awareness and education is rendered. This condition, however, could be improved by making forensic odontology a part of our academic curriculum, providing hands on courses for the same.

Keywords: Awareness, Forensic Odontology, Dentists, Davangere.

1. Introduction

Forensic is derived from the Latin word forum, which means “court of law”.

Odontology refers to study of teeth. Forensic odontology, therefore, has been defined by the Federation Dentaire International (FDI) as that branch of dentistry which, in the interest of justice, deals with the proper handling and examination of dental evidence, and with the proper evaluation and preservation of dental findings.[1]

Forensic dentistry is a challenging and fascinating branch of forensic science that involves the application of dental sciences in the identification of deceased individuals through the comparison of ante- and postmortem records. From AD 66 till date, dental identification has proved vital in identifying deceased individuals, the first case being accepted by the law in the year 1849.

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.

Based on the major fields of activity, Avon classified forensic odontology into civil, criminal and research. There are several areas of specialty with forensic

dentistry, which include the assessment of bite mark injuries, assessment of cases of abuse (child, domestic partner, or family), identification of finding human remains and identification in mass fatalities. The entity of forensic dentistry comprises four major areas of interest: Dental identification, Bite mark, Cheiloscopy (study of lip prints) and rugoscopy (study of palatal rugae patterns).[2]

Human dentition is considered as hard tissue analog to the fingerprints. It is almost as unique to an individual as fingerprints. Each adult human dentition consists of thirty two teeth of which some may be missing or malformed. Effects of various environmental events, like nutrition, drugs, etc. will also be manifested on the teeth. Each race has characteristic appearances on the dentition. With such an extensive array of differences, it is extremely rare to have two similar dentitions. The teeth are one of the most durable parts of our body which can withstand more assaults than any other part of the body. This is particularly useful in the identification of bodies in mass disasters and natural calamities.[1,2]

The question always arises as to whether the dental practitioners should know about forensic odontology, the reason being that dental identification provides an accurate source of identification of the victim or the suspect. In recent times, natural and man-made disasters are occurring more frequently in India with increasing crime like gang rape and child abuse. Under these conditions, the bodies of the victims become mutilated beyond recognition, where the vital role of dental surgeons comes into the picture in the identification of such individuals. Keeping this as the background, this study was undertaken to analyze and assess the awareness about forensic odontology among Dentists in Davangere city.

2. Methodology

2.1 Study design and population

A cross sectional descriptive study was conducted in May 2015 among 200 dental practitioners in Davangere. The list of dentists was obtained from the office of the respective Colleges in Davangere City. The questionnaire was distributed to all.

2.2 Ethical clearance

The study protocol was reviewed and approved by the Institutional Review Board of College of Dental Sciences, Davangere. Those willing to participate in the survey were requested to fill in the consent form and complete the questionnaire.

2.3 Pre-testing of the questionnaire

Questionnaire was administered to a panel of seven academicians and a convenience sample of 15 dentists were interviewed to gain feedback on the overall acceptability, validity and reliability of the questionnaire in terms of length, language clarity, time, and feasibility of dentists completing and returning it. Based on the opinions expressed a mean Content Validity Ratio (CVR) of 0.8 among academicians and Cronbach's coefficient of 0.9 in dentists was found. Face validity was also assessed and it was observed that 94% of the participants found the questionnaire to be easy.

2.3 Administration of Questionnaire

A self-administered, structured questionnaire written in English and validated through a pilot survey included 12 close ended questions on:

1. Knowledge about the significance of dental records, identification of forensic investigation, methods in forensic odontology, dental age estimation, identification of an individual, bite marks, lip prints along with the demographic data.
2. Practices about maintenance of dental records, identification, collection, presentation and evaluation of dental evidences and attitude of the practitioner towards maintenance of dental records and evidences.

Dentists were visited by a single investigator, and all available and willing participants were given the questionnaire on the day of the visit. Participants were asked to respond to each item in the questionnaire by choosing the most appropriate alternative. Confidentiality and anonymity of the respondents were assured.

2.4 Statistical analysis

The data were analyzed using the Statistical Package for Social Sciences version 21 software. Descriptive statistics were used to summarize the sample and responses to the questionnaire. Chi square test was used for statistical analysis. Level of significance was set at $p \leq 0.05$.

3. Results

About 200 questionnaires were distributed and the response rate was 100%. The mean age of the participants was 30.12 years. 101 participants were males and 99 were females out of the whole lot of 200.About 90% of the participants had a qualified Master's degree in Dental Surgery whereas only 10% were Bachelor's in Dental Surgery. The maximum work experience in the qualified field was about 22 years amongst the participants with minimum work experience of 5 years.

Table 1 shows the distribution of the subjects with respect to age, gender, qualification and years of experience.

Table 2 describes the chi square results for the significant responses with respect to age, gender, qualification and years of experience.

Table 1: Distribution of the study subjects according to age, gender, qualification and years of experience

Characteristic		Number	Percentage
Age	21-25 Years	13	6.5%
	26-30 Years	65	32.5%
	31-35 Years	61	30.5%
	35-40 Years	38	19.0%
	Above 41 Years	23	11.5%
Gender	Male	101	50.5%
	Female	99	49.5%
Qualification	MDS	190	95%
	BDS	10	5%
	1-5 Years	101	50.5%
	6-10 Years	30	15%
Experience	11-15 Years	25	12.5%
	16-20 Years	22	11%
	Above 21 Years	22	11%

Table 2: Awareness and Compliance about Forensic Odontology among the participants

Questions	Response		Age	Gender	Qualification	Years of experience
	Yes	No	p value	p value	p value	p value
Do you think Forensic Odontology as a subject is important?	90	110	0.000**	0.205	0.000**	0.492
Do you know about the Forensic Odontolgists in India?	189	11	0.103	0.255	0.035*	0.138
Do you have any Forensic Dentistry Department at your college?	164	36	0.000**	0.037*	0.000**	0.070
Do you maintain Dental records in your clinic?	118	82	0.000**	0.000**	0.000**	0.037*
Are you aware of the significance of maintaining dental records in identifying the deceased and crime suspects?	177	23	0.000**	0.000**	0.000**	0.000**
Do you know Saliva swabs act as a source of DNA	50	150	0.028*	0.887	0.064	0.004*
Forensic odontology is reliable only if evidences are collected within a certain period of time of the crime?	49	151	0.000**	0.280	0.214	0.008**
Palatal Rugoscopy is the most useful method in identifying an edentulous individual?	118	82	0.004*	0.05*	0.022*	0.000**
Do you know that molecular insights of saliva can be used in solving paternity dispute issues?	27	173	0.004*	0.32	0.022*	0.000**
Do you know that intercanine width as a tool in two dimensional reconstructions of face and automated dental identification system can be an aid to forensic dentistry?	55	145	0.05*	0.032*	0.05*	0.000**

Test used: Chi Square Test,*$p \leq 0.05$ significant, ** $p \leq 0.01$ highly significant

Figure 1: Graph showing the various modes of forensic evidences as answered by the participants

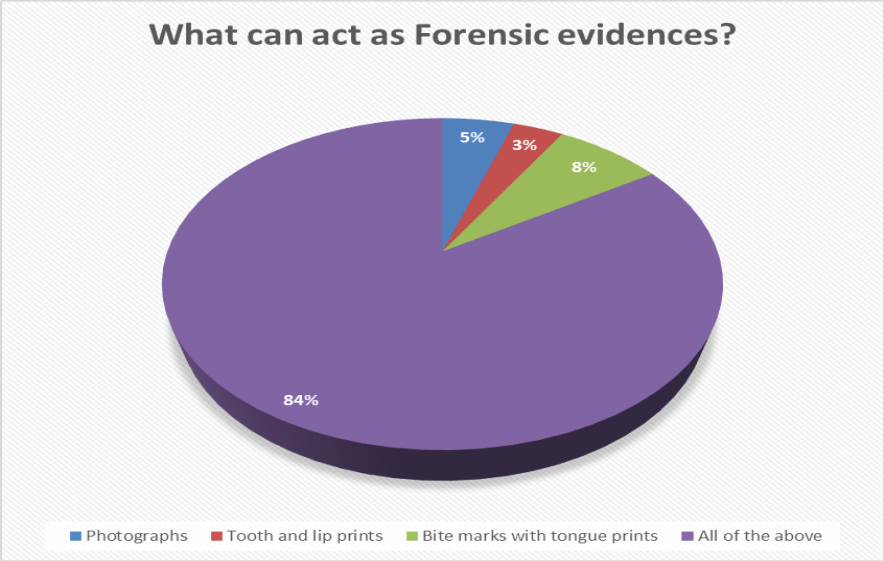
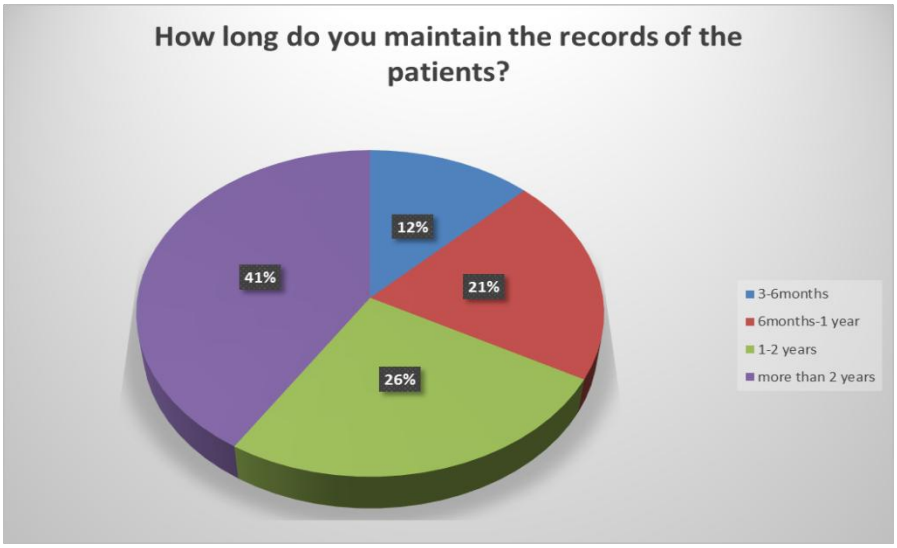


Figure 2: Graph showing the participants maintaining the records of the patients for various time durations



4. Discussion

Despite the demand for well-educated and experienced forensic odontologists being recognized globally, the progress in forensic odontology in India has been relatively slow.

Forensic odontology is an important branch of the study of dentistry that would assist in solving cases of abuses and deaths. Greater knowledge and awareness of forensic odontology among the dental practitioners would be required in the growing field of medicine.

Although each dental practitioner has a responsibility to understand the forensic implications associated with the practice, the importance of providing proper education and training in forensic odontology is not practiced. A traditional dental education does not equip one in possessing the knowledge and experience that are required to evaluate and interpret dental records for forensic odontology purposes. This study showed that about 94% of the participants agreed that forensic dentistry as a subject is important and that it should be a part of the BDS/MDS curriculum.

The present study revealed that 88.5 % of the participants were aware of the importance of maintaining dental records.59% of the dentists maintained the dental records.40% of the participants maintained the dental records for more than 2 years. A study done by Nagarajappa *et al* done in Kanpur proved that all the dental practitioners maintain dental records and can become valuable members of the dental identification process by developing and maintaining standards of record-keeping, which would be

valuable in restoring their patients' identity.[3] Another study done in Rajasthan by Preethi *et al* concluded that a low percentile of 17% dentists did not know of maintaining dental records.[4]

The identification of a large number of causalities in mass disasters is complex and fraught with hazards, both physically and emotions. For developing countries like India, dental identification is an appropriate method to consider in Disaster Victim Identification. In the present study, 86.5% of dental practitioner had no formal training in collecting, evaluating and presenting dental evidence.[5,6]

Regarding the knowledge about forensic odontology among the participants about 88% of the dentists were not aware about the modern techniques, presentation, collection, identification and evaluation of dental evidences. Studies done by Khare *et al* and Harchandani *et al* concluded that there is lack of knowledge and awareness among the dentists in India about Forensic odontology.[7-9]

5. Conclusion

This study, conducted among 200 dental practitioners regarding their awareness and compliance about forensic odontology, revealed inadequate knowledge, poor attitude and lack of practice prevailing among these study subjects. This study reflects the current situation of our country in the field of forensic odontology. Forensic odontology is a still in the infancy stage in India, but, can touch the sky if proper awareness and education is rendered. This condition, however, could be improved by making forensic odontology a part of our academic curriculum, providing hands on courses for the same.

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