

ORIGINAL ARTICLE

UNLOCKING CLUES THROUGH DENTAL RECORDS: A DESCRIPTIVE ANALYSIS OF DENTISTS' ROLE IN FORENSIC INVESTIGATIONS

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Background: Dental records have become a crucial source of information to forensic odontology's impressive expansion, particularly in medicolegal instances. Dentists are required by law to maintain patient records. Dental remains typically last longer in fatal conditions, assisting with personal identification in mass tragedies, law enforcement investigations, and medicolegal matters. It is mandated by law that every dentist must keep some kind of records for every patient they treat; demands of busy clinics often result in neglect of this obligation. The purpose of this study was to assess dentists' knowledge regarding dental record maintenance. **Methods:** It was a cross-sectional observational study. Data was collected using a questionnaire administered through personal interviews. The purpose of the questionnaire was to gauge the dentists' understanding of forensic odontology techniques as well as their routine practices for keeping dental records. The gathered data underwent descriptive analysis before being condensed and analysed with SPSS-20. **Results:** Only a very small percentage (22%) of the dentists maintained records on a regular basis, while majority (78%) did not maintain any records. **Conclusion:** Only a minority of dentists in Lahore retain dental records, indicating poor record-keeping methods. This causes lack of forensic utilization of valuable and reliable information in medicolegal issues.

Keywords: Dental remnants, dentists, forensic odontology, medicolegal cases

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INTRODUCTION

Dental records are essential to dentistry because they provide dentists and patients with important sources of information, particularly in medicolegal cases in general practice. Every dentist is required by law to keep accurate records for every patient they treat.¹ For the purpose of providing excellent patient care and facilitating essential follow-ups, dental records must be kept meticulously. Having structured information on dental records is crucial for all dental professionals having structured information on dental records is crucial for all dental professionals, especially as the public becomes more aware of legal issues related to healthcare. Dental records also hold significant value in teaching and research.² Dentists must ensure the preservation of sufficient patient records, which also contributes to upholding the standards of good clinical practice.

According to a recent Indian study, records were kept by only 38% of the surveyed dentists. In European and American nations, the maintenance of dental records is mandated by law³, whereas in Asia, awareness of this requirement is lacking. Strikingly, 62% of dentists admitted to never keeping records for their regular patients. There is scarcity of studies on this topic in many countries including India and Pakistan.⁴

The dental practitioner must acknowledge the importance of maintaining dental records, as they are crucial for legal purposes and ensure the delivery of excellent patient care and services. The viability of dental practice is directly impacted by the correctness of

these records, which demonstrate the level of clinical expertise and competency. When it comes to children, there are specific guidelines for retaining records. Once the child reaches a certain age, these documents must be kept on file for a specific amount of time. Dental offices should have a well-defined policy in place that all dental team members comply with and can easily understand. This ensures proper handling and maintenance of paediatric dental records. It is crucial to adhere to the principle that original dental records, including radiographs, should not be shared with any other party.⁵

Forensic Dentistry plays a critical role in identifying individuals who are challenging to recognize visually, especially in situations where fingerprints, personal effects, or other identifying features are absent due to catastrophic accidents.⁶⁻⁸ In fact, a significant percentage of dentists still maintain patient records on paper, which are kept in filing cabinets and racks.

No matter how formal the request for the originals may appear, only copies should be provided, and the original records must be kept within the dental offices. However, there is a growing trend among dentists to integrate new technologies into their practices in order to efficiently manage the enormous volume of existing records. This guarantees the accuracy and security of the patients' data.⁹

In a study carried out in Scotland by Morgan *et al*, forms completed by district reference officers and general dental practitioners were compared in order to assess the standard of record-keeping in primary dental care. The findings indicated that 48% of the charting

remained unchanged, suggesting that records made during the initial visit were not updated as needed. This highlights the importance of regularly updating patient records to ensure accuracy and completeness.¹⁰

The objective of this study was to assess the level of expertise among private dental practitioners in Lahore regarding the maintenance of dental records.

METHODOLOGY

This descriptive research study randomly selected 100 practicing dentists from different regions of Lahore, Pakistan. The sample size was determined based on the power sampling results from a previous study conducted by Astekar *et al*.⁴. The dentists were chosen using a stratified random sample technique from different areas of Lahore. Before beginning the study, the Institutional Ethical Committee granted its approval. The dentists were personally contacted over a six-month period (Dec 2022 to May 2023) and informed about the study objectives and their written consent was obtained.

A questionnaire was used to gather information about dental practitioners' methods for keeping dental records, and it was designed in accordance with the standards established by the American Academy of Pediatric Dentistry. Twenty-five dentists participated in pilot study, and the questionnaire was changed accordingly. The dentists were surveyed regarding their practices for preserving records as well as their expertise of forensic odontology and its varied techniques. SPSS-20 was used to analyse the data, and $p \leq 0.05$ was considered statistically significant.

RESULTS

Only 22% of dentists kept records on a regular basis, while 78% did not keep any records at all. Ninety-one percent of the dentists did not agree to the need of keeping dental records as a legal requirement. Only 4% of them had been requested to provide records in court for medicolegal reasons, and none of them had been asked to conduct age estimation processes in forensic cases. (Table-1).

Eighty-five percent of the dentists kept the necessary information, including name, age, contact information, relevant medical history, chief complaints, complete mouth examination, dental anomalies, and treatment information in their records. Informed consent for keeping the records was obtained from 66% of the cases, but the practitioners kept records of only 60% cases for at least 5 years. All dentists took radiographs and noted information on them, but only 47% kept patient files, and none of them documented radiograph information in the patient files. When giving radiographs or models to patients for usage, just 16% of doctors secured patient signatures. About 62% of the

records contained additional information such as residence, occupation, and dental information, however none of the prescription medicine or telephone calls were recorded. (Table-2).

The participants showed good awareness of the significance of dental tissues despite their little familiarity with the discipline of forensic odontology. For instance, 76% of the participants understood that enamel and dentin may both help determine age, and that natural teeth can be a good source of DNA. Similarly, 69% of the participants were aware that examining bite mark patterns might be extremely important in determining whether or not an assault was illegal. (Table-3).

Concerning their awareness of forensic odontology methods, only 13% of the dentists believed they had adequate knowledge. Interestingly, 76% felt the need for appropriate understanding of forensic dentistry in their routine clinical practice, and 67% expressed interest in attending programs to enhance their knowledge in this field.

Table-1: Dental professionals' knowledge of record keeping and its significance (n=100)

Questions	Responses		p
	YES	NO	
Do you maintain dental records of your patients?	22	78	0.028
Do you believe you are legally bound to maintain patients' records?	9	91	
Is the dental file medico-legally important?	100	0	
Were you ever asked to reproduce dental file?	4	96	
Were you ever asked for age estimation on dental examination?	0	100	

Table-2: Distribution of various parameters maintained in the records (n=100)

Parameters	Responses n (%)	p
Personal details: Name, age, gender, contact number, complete postal address, occupation	17 (85)	0.034
Relevant medical history	22 (100)	
Reason for visit	22 (100)	
Complete mouth examination	22 (100)	
Informed consent	15 (66)	
Radiographs (maintained onto files)	47 (47)	
Details mentioned on file while handing over the records	16 (16)	
Recording telephonic consultation	0 (0)	
Recording prescribe medication	0 (0)	
Keeping file for about 5 years	13 (60)	

Table-3: Knowledge regarding forensic importance of dental tissues

Knowledge/Parameter	Percentage
Teeth can be a source of DNA	76
Enamel/dentin can be used to help estimate age	70
Human lip print patterns can be utilized to identify a specific person	49
Human teeth pattern of bite marks can be a significant	69

Table-4: Perception of dental practitioners about the importance of forensic odontology (n=100)

Questions	Responses		p
	Yes	No	
Do you believe you are knowledgeable enough about forensic dentistry and its techniques?	13	87	0.043
Have you attended any workshops regarding forensic odontology?	8	92	
Do you think you need to know forensic odontology in detail for your clinical practice?	76	24	
Would you like to attend any workshop related to forensic odontology and its methods?	67	33	

DISCUSSION

The results reveal a concerning trend in dental record maintenance among dentists in Lahore, with only a small fraction consistently keeping records while the majority neglect to do so. This lack of record-keeping reflects broader challenges within private clinics, where financial considerations often outweigh the importance of accurate documentation. In their efforts to maximize patient throughput and clinic revenue, dentists may prioritize speed over thorough record-keeping practice. However, the implications of this negligence extend beyond financial concerns, particularly in forensic and medicolegal contexts.

The date of appointment holds great importance for legal authorities, especially in cases involving missing persons or identifying suspects in crimes.^{11,12} According to a recent study conducted by Tahir *et al*, students typically keep better records of patient appointments, with only 27% of private clinics recording this vital information compared to 55% of students. The appointment date must be included in order to help investigators determine when a particular deceased person or suspect was last seen.¹³

Radiographs hold significant importance and value in dentistry. They are essential for revealing tooth-colored restorations, aiding in identification, and assisting in estimating age based on the number of erupted teeth.^{14,15}

Forensic odontologists, who specialize in this field, have the expertise to identify a person through dental means. The role of all dentists in managing patients' dental records is equally important. These records can serve for identification purposes by comparing dental records before and after death. Patient records may include handwritten or digitized notes, dental radiographs, models, and intra- and extra-oral photographs.

Forensic odontologists face significant challenges in dealing with deficient or inaccurate dental records, which can interfere with the process of identifying a person. To overcome this growing challenge in the medical field, dental practitioners need to have sufficient knowledge and awareness of forensic odontology. The application of forensic odontology has

gained ample value, especially in developed countries worldwide, where the demand is increasing.¹⁶

This has also been made clear by earlier research conducted in Pakistan, where participants generally agreed that there was no official department of forensic dentistry or that they were unaware of it.¹⁷ Similarly, 84.8% of respondents in a survey of Pakistani dental specialists believed that their understanding of forensic odontology is insufficient.¹⁸ Although the science of forensic odontology has gained considerable importance throughout developed nations, it has not yet reached its full potential in underdeveloped countries. This can be a result of forensic odontology not being recognized as a separate field under Pakistan's dental curriculum. The focus of the specialty of forensic odontology is on the importance of dental records kept by dental professionals in forensic investigations. Reliability of dental record keeping, usability and legibility, is important criteria that support their use as dental evidence. Legislative bodies set rules for dental record keeping in developed nations including the UK, USA, and Canada. However, it seems that dental professionals in Pakistan don't handle their dental records well. 52.4% of participants in a study agreed that dental record management was not taught as part of their curriculum.^{17,18}

We evaluated the participants' self-reported record-keeping methods. Unexpectedly, 59% of dentists did not keep their patients' dental records on file. This might be a result of, at least in part, the time crunch and increasing workload in crowded clinical settings. This can account for our result that only a small percentage of research participants had experience providing dental evidence in court. Photographs are crucial for visually identifying individuals, as illustrated by the case of the Countess of Salisbury, who was known for her distinctive gold denture. Surprisingly, only 8% of dentists captured images of their patients, showing a lack of knowledge about how important they are. In the identification procedure using rugoscopy, which depends on the distinctive pattern found in every person's mouth, casts and study models are particularly helpful. This technique, which is especially useful in post-mortem instances, calls for ante-mortem records for comparison.

Although the participants had little experience with the field of forensic odontology, their comprehension of the importance of dental tissues in forensic cases was considered satisfactory. Recent media attention to the forensic field, in particular emphasizing the significance of forensic odontology in identification of victims of Pakistan International Airline plane crash, may be one cause for this.^{19,20}

Most dental professionals who were asked about potential obstacles cited a lack of digital access and an increased workload as the main problems

preventing them from storing correct and comprehensive dental records. These obstacles can make it difficult for the dentist to manage dental records properly. Dentists are underrepresented in forensic investigation and procedures due to a lack of knowledge and expertise in forensic odontology. For instance, research carried out in Pakistan found that just 54% of dentists knew they were legally permitted to present forensic dental evidence in court. Moreover, 92% of dental professionals in Pakistan could not confirm the existence of any forensic odontologists.¹⁸

CONCLUSION

Only 22% of dentists in Lahore retain dental records, indicating poor record-keeping methods. This causes lack of forensic utilization of valuable and reliable information in medicolegal issues.

RECOMMENDATIONS

Dentists should update their knowledge of forensic aspects of dental records through continuing education and training. Ultimately, this commitment will benefit both dental professionals and the judicial authorities conducting forensic investigations.

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