

Assessing Awareness and Knowledge About Forensic Dentistry Among Law Enforcement Agencies in Bengaluru City - Police Department

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Abstract:

Introduction: Forensic odontology encompasses the systematic management, examination, evaluation, and presentation of dental evidence within the framework of criminal or civil proceedings, all with the ultimate aim of ensuring justice. In this regard, the primary responders to crime scenes are invariably police personnel, tasked with establishing the integrity of the chain of custody. Their adeptness in identifying and proficiently preserving biological evidence assumes heightened significance in the progressively burgeoning field of forensic odontology. **The objective of the study:** This study aims to assess the level of knowledge, awareness, and interest regarding forensic odontology among law enforcement personnel in Bengaluru. Forensic odontology, the application of dental expertise in legal investigations, is a field of increasing importance. This study aims to underscore the significance of forensic odontology within the context of law enforcement. The findings of this study could have far-reaching implications. If the survey reveals a knowledge gap or lack of awareness about forensic odontology among law enforcement personnel, it might underscore the need for targeted training and awareness programs. This, in turn, could result in swifter and more accurate identifications, stronger cases in court, and overall improvements in the criminal justice system's efficacy. **Materials and methods:** The willing participants received a structured questionnaire in English. The questionnaire included 29 KAP criteria-based questions distributed among officials on a working day. Information about the study was provided to all the participants and consent was taken. **Results/ Findings:** This study established that the understanding of forensic odontology was modest. It was refreshing to note that most of the respondents were eager to learn more from domain experts through workshops & short training courses. Still, the majority indicated that a lack of facilities was the biggest hindrance. **Conclusion:** This study, done in the police department, shed insight into these officials' knowledge, awareness, attitudes, and practices. It was observed that the understanding of forensic odontology is reasonable, but formal training and workshops are warranted. This study demonstrated that dental evidence can be examined with the assistance of a forensic odontologist.

Keywords: Attitude; Awareness, Forensic Odontology; Knowledge; Officers, Police

Introduction:

Keiser-Neilson defined forensic dentistry as “that branch of forensic dentistry that in the interest of justice deals with the proper handling and examination of dental evidence and the proper evaluation and presentation of dental findings.”^[1]

Forensic odontology, a specialized field that bridges the gap between dentistry and criminal investigations, plays a pivotal role in the pursuit of justice. However, the effective utilization of forensic odontology relies not only on the expertise of dental professionals but also on the knowledge and awareness of law enforcement agencies. The

ability of police officers to recognize the potential value of dental evidence, understand its significance, and employ it effectively in criminal investigations is of paramount importance. Therefore, this study seeks to assess and analyze the knowledge of forensic odontology among police personnel, aiming to shed light on the current level of awareness, identify areas of improvement, and ultimately enhance the integration of forensic odontology within law enforcement practices.

This study will delve into the following key aspects:

- Assess the baseline knowledge of forensic odontology among police personnel through a survey. This will provide valuable insights into the extent to which officers are familiar with the field.
- Assessing the awareness of the various applications of forensic odontology and their significance in criminal investigations. This includes understanding if officers recognize the potential value of dental evidence in different types of cases.
- The study will also identify any challenges or barriers that may hinder the effective utilization of forensic odontology within law enforcement, such as resource constraints, misconceptions, or lack of institutional support.

In conclusion, this study on the knowledge of forensic odontology among police personnel seeks to bridge the gap between the dental and law enforcement communities. By assessing the current state of knowledge, identifying areas for improvement, and proposing actionable recommendations, aiming to strengthen the integration of forensic odontology into police practices, ultimately contributing to more effective and just criminal investigations.

Materials and methods:

A structured questionnaire written in the English language was given to all willing official participants. The questionnaire included a set of 29 KAP criteria-based questions along with demographic data. The questionnaire was distributed among officials on a working day. Information about the study was provided to all the participants and consent was taken.

Inclusion criteria for law enforcement department officials:

Officer's minimum of five years of experience

Exclusion criteria for law enforcement department officials:

Officers on special duty.

Officers on short-term duty and leave.

Study design:

Cross-sectional survey

Sample size:

100 Bengaluru police officers

Study population:

Bengaluru police department officials

Statistical tool used:

The data collected was compiled and subjected to statistical analyses using Statistical Package for Social Sciences (SPSS version, Chicago II USA) software, version 17.0.9

The significance level was fixed as less than 0.05.

Ethical Clearance:



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The Institutional Review Board (IRB) meeting was held on 13-06-2022 from 9.30am to 12.30pm in the Seminar Hall, Department of Orthodontics, 5th Floor of DSCDS and the meeting was chaired by Dr. Chandrashekar Janakiram. The following members of Institutional Ethical Committee (IEC) attended the meeting.

1	Dr. Chandrashekar Janakiram	Chairperson
2	Dr. Nagesh.L	Member Secretary
3	Dr. Vasundara	Pharmacologist
4	Dr. Rajeshwari.N	Basic medical scientist
5	Mrs. Tara Madusudhan	Sociologist
6	Mr. Subramanya Prasad	Advocate
7	Mr. M.S. Sridhara	Religious Person and Philosopher
8	Mr. Nagesh Puranik	Layperson

The IRB reviewed the submitted synopsis pertaining to RGUHS UG-STS 2021 titled as "Assessing Awareness and Knowledge about Forensic Dentistry Among Law Enforcement Agencies in Bengaluru City" with Miss. Sheema Anjum as the primary investigator and Dr. Krishnanand PS as the guide from the Department of Oral Pathology.

Dr. Nagesh L.
 Member Secretary
 RD & SC
 DSCDS
 Bangalore.

Dr. Hemanth M
 Chairperson
 RD & SC
 DSCDS
 Bangalore.

Results:

A questionnaire-based study was undertaken among police officials. The data from the questionnaire were analyzed and the following inferences were derived.

Table 1: Distribution of study population based on knowledge

What is forensic odontology?	
Responses	N (%)
Forensic odontology deals with teeth and mouth	50(60.2)
Forensic odontology deals with poison cases	10(12)
Forensic odontology deals with human skeletal remains	3(3.6)
Forensic odontology deals with the time of death	1(1.2)
All of the above	19(22.9)

Upon evaluation, it was observed that a significant number of police officials possess a general understanding that forensic odontology intersects the domains of dentistry and forensic sciences. This observation is substantiated by the data presented in the table, where a substantial majority of 60 officials opted for the option "a" (Forensic odontology pertains to teeth and the oral cavity) based on their responses.

Questions	Yes	No
	N (%)	N (%)
Are you aware that a dentist can testify as an expert witness in court to present forensic dental evidence?	66(79.5)	17(20.5)
Do you think forensic odontology can help in solving various crimes?	58(69.9)	25(30.1)
Do you know about the various dental evidence that can be collected from the crime scene?	51(61.4)	32(38.6)
Do you know any case solved with forensic odontology?	47(56.6)	33(43.4)

Additionally, it is evident from the table above that a majority of the officials exhibit proficiency in comprehending the medicolegal implications of forensic odontology. This proficiency extends to their understanding of various aspects such as providing testimonies in legal contexts, recognizing

dental evidence, and being cognizant of previously resolved cases in the realm of forensic odontology.

This study also highlights that the presence of forensic odontologists during evidence collection at crime scenes is a rare occurrence, as indicated by the data presented in the table below.

Who visits the scene of the crime?	
Responses	N (%)
Crime investigative officer, Biologist, forensic odontologist	16(19.3)
Crime investigative officer. medical officer, forensic expert	40(48.2)
Crime investigative officer, biologist, toxicologist	12(14.5)
Crime investigative officer, biologist. Human Rights Officers	15(18.1)

This study provided valuable insights into the awareness, attitudes, and practices of these officials. It was noted that while their understanding of forensic odontology is reasonable, there appears to be a need for formal training and workshops to enhance their knowledge further.

Discussion:

Police officers play a crucial role in forensic odontology, which is a specialized field of forensic science that focuses on the examination and analysis of dental evidence for identification and criminal investigations. Police officers must work closely with forensic Odontologists to gather and utilize dental evidence effectively, hence it is discouraging to note that SiddharthPandit et al. in their study conducted in Mysore observed that 99.4% of investigated events did not include forensic odontologists during their visit to the crime scene.^[2]

One of the primary roles of police officers in forensic odontology is the recognition and preservation of dental evidence at crime scenes. They are trained to identify potential sources of dental evidence, such as bite marks on victims, suspects, or objects, and take the necessary steps to ensure its preservation. This includes protecting the integrity of the evidence, documenting its location and condition, and packaging it properly to prevent contamination or damage. Therefore, this is the reason Deepti Sharma et al. in their study recommends the inclusion of Forensic odontology as a separate subject in the training curriculum of police officers as police professionals.^[3]

Internationale (FDI) defines forensic odontology as a branch of dentistry that, in the interest of justice, deals with the proper handling and examination of

dental evidence and with proper evaluation and preservation of dental findings.^[4] Avon classified forensic odontology into civil, criminal, and research.^[5] The importance of communication, training, and evidence based guidelines for collecting dental samples from the crime scene is essential to identify the offenders or victims. Knowledge about recognizing a dental sample as evidence by the police personnel is important so that there is no loss of evidence.^[1]

Moreover, police officers collaborate with forensic odontologists to establish victim identification in cases where conventional identification methods, such as fingerprints or DNA, are not available or insufficient. Dental records, including dental charts, X-rays, and photographs, are invaluable resources for identification purposes, hence Mansour Al Sarhani advocated the implementation and utilization of forensic odontology in criminal investigations to identify suspects and victims.^[6]

Additionally, police officers play a significant role in the collection of bite mark evidence. In cases where bite marks are found on victims, suspects, or objects, officers are responsible for accurately documenting and photographing the marks.

In summary, police officers fulfill a vital role in forensic odontology by recognizing and preserving dental evidence, facilitating victim identification through dental records, collecting and documenting bite mark evidence, and acting as intermediaries between forensic Odontologists and other Law Enforcement Agencies. Their collaboration with forensic Odontologists is essential for successfully utilizing dental evidence in criminal investigations, contributing to the administration of justice and the resolution of cases.

The majority of the respondents felt that a lack of facilities in the governmental setup was the most significant hindrance which was why age was not being estimated using forensic odontology means. This also translated into the department not optimally using the services of forensic odontologists as experts in solving cases of age estimation. This substantiates the need for a private dentist who is equally qualified & trained as a governmental dentist to help solve cases requiring a forensic dental opinion.

Acknowledgement:

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