ORIGINAL ARTICLE

AWARENESS OF FORENSIC ODONTOLOGY AMONG NIGERIAN DENTISTS: A knowledge, attitude and practice study

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ABSTRACT

Background: Forensic odontology has over the last few ye revolutionized the science of identification of living deceased persons through the analysis of dental reco However it is taught that this field is underutilized developing countries. This study aims to assess knowledge, attitude and practice of forensic odonto among a cross section of Nigerian dental surgeons and perceived role in furthering the discipline in Nigeria.
Materials and Methods: A pre-validated self-adminis questionnaire was distributed to eighty one Dental Surg attending the 2013 Annual Scientific Conference of School of Dentistry, held in Benin City, Edo State, Nig
Results: There were 58 (71.6%) males and 23 (28.4%) fe respondents. Seventy seven (95.1%) claimed to keep ade records. Only 38 (46.9%) dentists kept clinical photog 54 (66.7%) of them kept radiographic records, whi (77.8%) dentists discarded study cast of the patients. T six (32.1%) dentists kept dental records for a minimum o years. Thirty three (40.7%) dentists could not estimate age. Histological (63.0%) and biochemical (43.2%) m were the least known methods of estimating age depe changes in teeth. Sixty one (75.3%) dentist could rec physical and behavioral signs of abuse. Twenty six (3 dentists were unwilling to testify as expert witness in the of law. Majority of the dentists 65 (80.3%) acquired knowledge of forensic odontology from update course 22 (27.2%) were taught in their undergraduate years
Conclusion: There is greater need for dental practitio Nigeria to appreciate the field of forensic odontolog will help sustain the ethics of their clinical practice, by proper record keeping, that are legally admissible and o resolution of cases.

Keywords: Awareness, forensic odontology, Nigerian Den

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INTRODUCTION

Forensic dentistry (forensic odontology) is that aspect of dentistry concerned with the correct management, examination, evaluation and presentation of dental evidence in criminal and civil legal proceeding.[1] This field consist of two primary areas. Firstly, disaster victim identification or identification of people who have become casualties as a result of a crime, and secondly, identification, examination and evaluation of bite marks (BM) on victims during sexual assault and child abuse. [2]

Interest in forensic dentistry was relatively dormant until 1960s, when renewed interest was ignited by the first formal institutional program in forensic dentistry given in the United States at the Armed Forces Institute of Pathology. Since then, there have been tremendous breakthroughs that the term forensic dentistry became not only familiar to Dental Surgeons but also to the law enforcement agencies and other forensic groups in the United States. [3]

Physical identification, finger prints, DNA analysis are known forensic methods of identification, each with its advantages and limitations. In case of mass disaster involving severe burns and /or following severe disintegration, visual recognition of facial features and finger prints is often impossible. Identification by dental means becomes the most reliable option because the tooth structure is resistant to flames. Changes brought about by age, pathological conditions and developmental anomalies or by intervention of Dental Surgeon, result in the mouth being unique to the individual. These changes assist in the identification of individuals.

In Nigeria, this area of dentistry is still in its early stages and there is a pressing need for a faster and proportional growth in the field to meet up with the prevailing challenges such as insurgences, pipe line explosion and its attendant need to identity victims, especially those with burns.[4, 5] In Nigeria, comprehensive finger print database and complete ante-mortem dental records are most lacking, making comparative dental identification almost a mirage. [6]

The aim of this study is to evaluate the knowledge, attitude and practice of forensic odontology among a cross section of Nigerian Dental Surgeons and their perceived role in furthering the discipline in Nigeria.

MATERIALS AND METHODS

This was a self-administered questionnaire based cross sectional study. The dental practitioners recruited for the study were participants at the Annual School of Dentistry scientific conference of the University of Benin, Nigeria. This conference brings together dental practitioners from different parts of the country to discuss and present scientific papers on current advances in the field of dentistry.

Ethical approval was obtained from the Research Ethics Committee of the institution and informed consent obtained from each participant.

A pre-validated questionnaire designed by Harchandair et al [7] was used for the study. The questionnaire had a set of 13 questions. The questionnaire assessed knowledge (dental age estimation and methods of estimation, identification of bite mark patterns, identification of features of child abuse and testifying as a witness in count) and practice (maintenance of dental records, attitude of practitioners towards cases of child abuse).

The data collected was analyzed using Statistical Package for Social Science (SPSS

version-17) for windows. Descriptive statistics was done for the collected data.

RESULTS

A total of eighty – one dental practitioners completed the questionnaire made up of 58 (71.6%) males and 23 (28.4%) females. Mean age of respondents was 36.7 ± 1.84 years. Different cadre of dental surgeons participated in the study with majority haven been in practice for between eleven and fifteen years (Figures 1 and 2).

Seventy seven (95.1%) dentists claimed to maintain and keep adequate dental records of their patients. Thirty eight (46.9%) respondents did not keep clinical photograph of patients. Majority of the dentist 54 (66.7%) kept records of patients' radiographs in the case notes, while 27 (33.3%) had no records. Sixty three (77.8%) respondents admitted discarding study cast of patients on completion of treatment. Thirty (37.0%) dentists were of the opinion that records (study cast, radiographs) should be kept for up to two years and after which they could be discarded while 26 (32.1%) of them opined that records should be maintained for a minimum of five years (Table 1).

Figure 1: Frequency distribution of cadre of Dental Surgeon

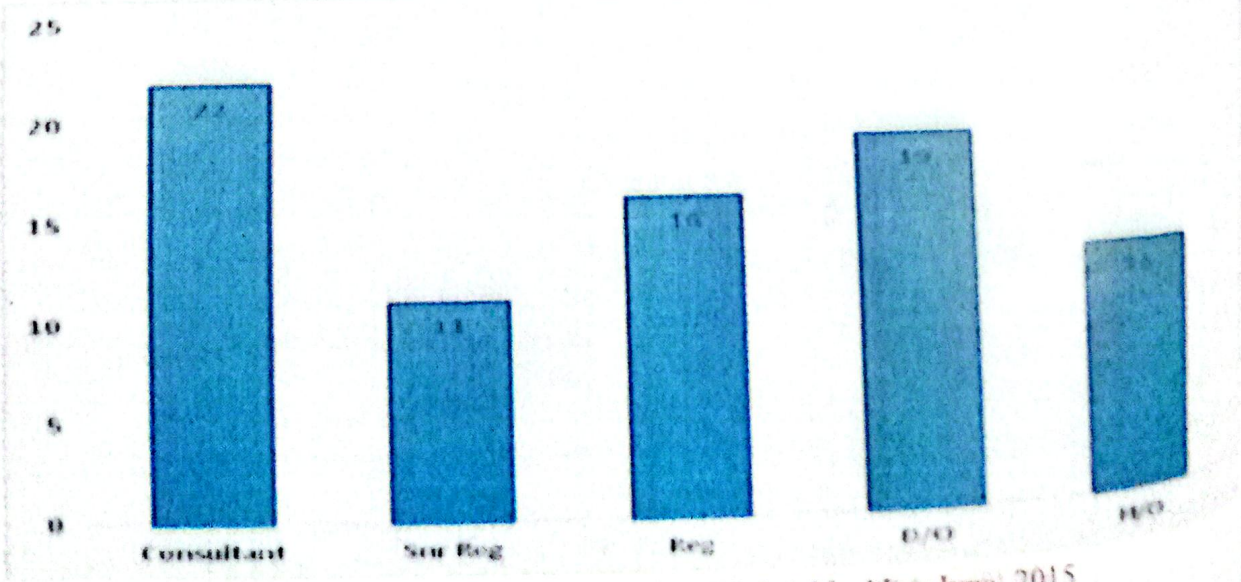
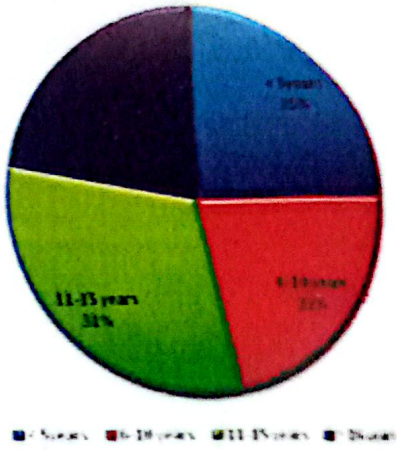


Table 2 shows the ability of dentist to estimate dental age and their awareness of methods of estimating dental age changes. All the respondents agreed that the tooth is a useful tool estimating an individual's dental age. Thirty three (40.7%) of the dental practitioners reported not been able to estimate dental age of an individual. Histological (n=51, 63.0%) and biochemical (n=35, 43.2%) methods were the least known methods of age estimation among the dentists.

Figure 2: Distribution of participants by their years of practice



Snr Reg- Senior Registrar, **Reg** – Registrar **D/O** –Dental Officer, **H/O** – House Officer

Table 1: Type and duration of dental records maintained by dental surgeons

Maintenance of adequate dental records	n (%)
Yes	77 (95.1)
No	4 (4.9)

Nature of records maintained after completion of treatment	Yes n (%)	No n (%)
Study Casts	18 (22.2)	63 (77.8)
Radiographs	54 (66.7)	27 (33.3)
Clinical photographs	43 (53.1)	38 (46.9)

Duration of maintenance of records	n (%)
< 2 years	30 (37.0)
2 – 5 years	25 (30.9)
> 5 years	26 (32.1)

Table 2: Ability to estimate dental age and awareness of methods of estimating dental age changes

	Yes n (%)	No n (%)
Ability to estimate dental age of an individual	48 (59.3)	33 (40.7)

Awareness of methods of estimating age changes in teeth.	Yes n (%)	No n (%)
Morphologic method	81 (100)	0 (0)
Radiologic method	72 (88.9)	9 (11.1)
Histologic method	51 (63.0)	30 (37.0)
Biochemical method	35 (43.2)	46 (56.7)

Table 3: Awareness of importance of bite mark patterns and role of Dentist in cases of physical abuse

Evidentiary importance of bite mark patterns	n (%)
Aware	54 (66.7)
Not aware	27 (33.3)
Is bite mark unique to the individual?	
Yes	28 (51.9)
No	26 (48.1)
Are you aware of the physical and behavioural signs of abuse	
Yes	61 (75.3)
No	20 (24.7)
Role of dentist in cases of physical abuse	
Treat and discharge	34 (42.0)
Report to relevant authority	25 (30.9)
Really do not know what to do	22 (27.1)

Majority of subjects 54 (66.7%) were aware of the evidential importance of bite mark (BM) patterns in forensic dentistry. Twenty (37.9%) of them felt that BM analysis was full proof evidence (Table 3).

Sixty one (75.3%) dentists were aware of physical and behavioral signs of abuse. When presented with case of an abused patient, 34 (42%) dentists responded that they would treat and send patients away, while the 22 (27.1%) claimed not to know what to do in such a situation (Table 3). Sixty eight (84.0%) dental practitioners were aware that they could be called upon so testify as expert witness. However, twenty six (32.1%) of them were unwilling to testify in the court of law (Table 4). None of the dental practitioners reported having any formal training in collecting, evaluating and presenting dental evidence. Majority 65 (80.3%) of respondents acquired the knowledge of forensic dentistry through revision and update programs in the course of their practice. Twenty two (27.2%) were taught as undergraduates (Table 4).

Table 4: Dentists as expert witnesses and their source of knowledge of forensic odontology

Dentist as expert witness	n (%)
Aware	68 (83.9)
Not aware	13 (16.1)
Willingness to testify	
Yes	42 (61.8)
No	26 (38.2)
Source of knowledge of forensic odontology	
Undergraduate curriculum	22 (27.2)
Revision courses	54 (66.7)
Media	5 (6.1)

DISCUSSION

The most common role of a forensic dentist is the identification of living and diseased persons either for crime resolution or social, matrimonial or financial reasons. The fundamental principles of dental identification are those of comparison and exclusion. Comparison of ante-mortem and postmortem radiographs is reported to be the most accurate and reliable method of identifying remains.[9] Unfortunately dentists often maintain poor records, resulting in confusion that makes dental identification challenging.[10] Majority 77(95.1%) of respondents reported maintaining adequate records. However only 54(66.7%) dentists kept radiographic records and fewer dentists 18(22.2%) kept study cast. These findings suggest that most dentists consider dental records such as biodata, medical history, family history, clinical findings and treatment plan as the relevant records to be maintained. These records while necessary do little to unravel patient's identity in cases of mass casualties and death from burns. Over half of the dentists reported that dental records should be maintained for 5years or less. Only 26(32.1%) maintained records for longer than 5years. The findings suggest that most dentists are not aware of the general accepted minimum duration of maintenance of dental records in international law which is a minimum of seven to ten years.[9]

Age assessment using the teeth is an important guide in helping to establish the identity of an individual.[11] Dental age estimation has been used in developed countries by forensic dentists to resolve cases that involve identification of juveniles and deceased persons. Various methods have been employed to determine age changes in tooth substance. These include morphological method, radiological method, histological method and biochemical analysis.[12] These methods used independently or in conjunction has helped to further the field of forensic odontology. All the respondents were aware of the use of the teeth as a tool for estimating an individual's age. More than half of the dentists 48(59.3%) reported being able to determine dental age based on morphol-

This finding was higher than the reported 28% of general dental practitioners in Pune that could determine dental age based on morphology.[7] This difference could be attributed to the fact that the respondents in our study were mainly practicing in tertiary institution where there is continuous academic and clinical updates.

The science of bite mark (BM) analysis is a vital area in forensic odontology. It has proved pivotal in criminal investigation of homicide, sexual assault and abuse cases.[11] The majority of dentists were aware of the evidentiary importance of BM patterns. Just as the uniqueness or otherwise of BM patterns is still an area of controversy and research in the field of forensic odontology; same was reflected in the responses of the dentists. A study by Miller et al [12] attempted to shed some light on the uniqueness of human dentition using dental cast to produce bites on the un-embalmed human cadavers. They concluded from the study that it was difficult to distinguish a bite from individuals with similarly aligned dentition. Bite mark deformation which is influenced by its anatomical location has flow- on - effect on the registration of both class and individual tooth characteristics. In addition most of the assaults involving bite infliction are associated with tissue distortion due to the mechanical properties of skin. Current research on bite mark analysis like other aspects of forensic science is based on the premise that every contact (saliva) contains DNA which has the highest evidence value. Using DNA analysis it is possible to establish the origin of a sample that is isolated from biological material such as blood, teeth and saliva.

In our study, while majority of dental practitioners reported the ability to recognize physical and behavioral pattern of abuse, most did not know what to do when faced with cases of abuse of child, spouse or the elderly. This is why dentists should have adequate knowledge of bite mark patterns of humans and animals. Although child abuse or abuse inflicted on people of any other age is not a frequent area to the dentist, as a provider of primary health care, the dentist is mandatorily required to report such instances to the proper authorities in most jurisdictions. Most of the dental practitioners 68 (84.0%) were aware of the possibility of being invited as expert witnesses in cases of child abuse. However 26 (38.2%) of them were unwillingly to testify in court in cases of child abuse. While our study did not ascertain the reason for the reluctance, a prior study suggested ignorance about maltreatment, lack of awareness of legal mandate to report it, fear of dealing with an angry parent, reluctance to believe parents (or others) could be abusive or neglectful and fear of losing out on patients and therefore income.[13] Chiodo et al,[10] asserts that the primary role of a dentist intervening in any form of violence is to interrupt the violence, not to attempt to resolve individual conflicts or provide counseling for victims of violence which is beyond the scope dentistry and could in some situations result in more harm than benefit.

Majority of respondents did not have forensic odontology as part of their academic curriculum. This can only retard the progress and advancement of the field. Relying on the media and update courses would not suffice to meet the challenges ahead. However, more recently, forensic odontology has been introduced into the Oral pathology undergraduate program in some Nigerian dental schools. The need for adequately equipped laboratory for forensic dentistry and research will help boost the development of the area of forensic science.

Conclusion

The study reveals that the knowledge and practice of forensic odontology among Nigerian dentists is still very low. There is greater need for dental practitioner to appreciate the field of forensic odontology. This will help sustain the ethics of their clinical practice by way of proper record keeping that are legally admissible and assist in resolution of cases.

Conflict of interest: None declared

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