Assessment of the Awareness of Knowledge of Dental Records in Forensic Dentistry among Undergraduate Dental Students

Shyam Sundar Behura1, Shirsha Mukherjee2, Roquaiya Nishat3, Lipsa Bhuyan4, N Aravindha Babu5

1 Reader, Department of Oral Pathology and Microbiology, Kalinga Institute of Dental Sciences, KIIT Deemed to be University, Bhubaneswar, Odisha, India, 2 Senior Lecturer, Department of Oral Pathology and Microbiology, Vananchal Dental College and Hospital, Garhwa, Jharkhand, 3 Senior Resident, Department of Dentistry, Nalanda Medical College Hospital, Patna, Bihar, India, 4 Senior Lecturer, Department of Oral Pathology and Microbiology, Kalinga Institute of Dental Sciences, KIIT Deemed to be University, Bhubaneswar, Odisha, India, 5 Professor, Department of Oral Pathology and Microbiology, SreeBalaji Dental College and Hospital, Bharath Institute of Higher Education and Research, Chennai, Tamil Nadu, India

Abstract

Aim & Objectives: To assess the awareness of patient’s dental record maintenance among BDS students and to evaluate their knowledge regarding the potential use of their maintained records in forensic identification.

Materials and Method: Data was collected by means of a self administered questionnaire consisting of 24 closed ended questions, addressed on the awareness about patient’s dental record maintenance and its importance in forensic needs among 3rd, 4th year BDS students and interns of a private dental college.

Results: 73.1% of the respondents were aware that dentists were legally bound to maintain records in India and 83.5% were aware that these could contribute towards forensic investigations. Most of the students were aware of how to maintain dental records in an institution. 67.4% of the study population felt the need to store records for a minimum of 5 years. 65-70% had knowledge regarding denture markers and role of implants in forensic identification. The most perceived barrier to good dental record keeping was lack of time according to most of the students.

Conclusion: The survey revealed awareness on the importance of dental records in forensic identification among BDS students. Few areas showed inadequate knowledge, thus mandating an utmost need to train dental students in this field. Newer methods like denture marking and Aadhar number in corproartion in prostheses should be given importance.

Key Words: Aadhar number, Denture markers, Dental records, Forensic Odontology, Undergraduate dental students.

Introduction

Personal identification is of paramount importance in forensic investigations, and this can be done on the basis of the theory that “all individuals are unique and can be identified on the basis of individual characteristics.”1 Variety of methods can be used to corroborate forensic identity, but the reliability of each of these methods varies and moreover, cannot be used in all sorts of cases. DNA profiling, dermatoglyphics, anthropometric data, use of dental records are the standard methods employed.2,3 Since dental remains are usually the last ones to decimate post mortem, these can be of utmost importance in personal identification in mass disasters, natural or man-made. In addition to this, dental records can also help in identification of suspects in criminal investigations and in medico legal cases.4
Dental records comprise of clinical notes, radiographs, plaster models, treatment done including serial numbers of prosthesis. These records encompass an in-depth and continual documentation of the patient’s conditions and treatment, hence helping in diagnosis and patient care. These records also serve research, administrative, quality assurance, education purposes and can also be used as evidence in legal proceedings.

Thus, generating detailed accurate patient records, maintaining, storing and retrieving them should be a crucial part of practice and this habit should be inculcated during the professional training of dental students. Keeping all these facts in mind, this study was conducted to assess the awareness of patient’s dental record maintenance among BDS students, and also to evaluate their knowledge regarding the potential use of the maintained dental records in forensic human identification.

Materials and Method

This was a cross sectional study using descriptive qualitative methodology. The study population comprised of 3rd, 4th year students and interns of a private dental college in Bhubaneswar, Odisha. Data was collected by means of a self-administered questionnaire consisting of 24 relevant closed-ended questions addressed on the awareness about patient’s dental record maintenance and its importance in forensic needs. All the students were explained about the nature and purpose of the study and consent was obtained. The study protocol was approved by the Institutional Ethics committee.

Statistical Analysis

Pearson’s Chi-Square test was used to evaluate the association between interns, final and third BDS students regarding awareness on dental record maintenance and its forensic implications. P value of less than 0.05 was considered statistically significant.

Results

A total of 242 students responded to the survey, in which 82 were from 3rd year, 77 from 4th year and 83 were interns. Data regarding awareness of respondents about the medico-legal aspect of dental records and its contribution towards forensic investigations is charted in Table I. It also shows comparative results of the most effective and fastest method of forensic investigation among the students.

Table II shows awareness and knowledge of students regarding how to maintain dental records, how long records should be stored in institutions and the preferred method of maintaining and storing them. Table III displays knowledge of students regarding details to be included in personal information of patients, use of diagnostic aids and reports in patients file and their use as ante-mortem records.

Interns had better knowledge about recording treatment details, materials used and their use in identification of the deceased. Regarding denture markers and role of implants in forensic identification, percentage of knowledge ranged between 65-70% and did not show any statistical significant result. Awareness regarding use of records, dental anomalies, intraoral camera captures and photographs was found to be satisfactory among the three groups, wherein 72.3% of students believed dental anomalies could contribute towards personal identification. Around 70% of the study population believed that incorporation of “Aadhar Number” in dental records and prosthesis would help in identification of deceased individuals.

Table IV shows the most perceived barriers to good dental record keeping, students perception on attending CDE programs and workshops on Forensic odontology and their take on relevance of forensic odontology for a successful clinical practice.
**Table I : Table showing knowledge regarding importance of dental record maintenance, its medico-legal aspects and its use in forensic investigations.**

| Is dentist legally bound to maintain records in India | YES | NO | % | P-value |
|------------------------------------------------------|-----|----|---|---------|
| YES                                                  | 66  | 15 | 73.1 | 0.014* |
| NO                                                   | 61  | 16 | 26.9 |         |
| Can patient Dental record contribute for forensic investigations | YES | NO | % | P-value |
| YES                                                  | 71  | 12 | 83.5 | 0.680   |
| NO                                                   | 62  | 15 | 16.5 |         |
| Fastest, cost-effective & scientific method of forensic identification | DNA Profiling | 49 | 40 | 60.7 | 0.049* |
| Dental record comparison                             | 34  | 37 | 24  | 39.3    |

**Table II : Table showing awareness of students regarding maintenance of dental records, their duration and preferred method of maintenance.**

| Awareness about how to maintain records | Intern | Final Year BDS | III year BDS | % | P-value |
|-----------------------------------------|--------|----------------|--------------|---|---------|
| Yes                                     | 72     | 59             | 57           | 77.7 | 0.028*  |
| No                                      | 11     | 18             | 25           | 22.3 |         |
| Knowledge about how long the records should be stored | ≤ 5 years | 64 | 48 | 51 | 67.4 | 0.089 |
|                                         | > 5 years | 18 | 29 | 31 | 32.6 |       |
| Preferred method of maintaining and storing Dental Record | Manually | 12 | 7 | 30 | 20.2 | 0.000* |
|                                         | Electronic | 28 | 31 | 31 | 37.2 |       |
|                                         | Both     | 43  | 39 | 21 | 42.6 |       |
| Which method will allow faster accessibility & easy retrieval | Manually maintained Records | 21 | 17 | 52 | 37.6% | 0.000* |
|                                         | Electronic Dental Records | 61 | 60 | 30 | 62.4% |       |
Table III: Table showing knowledge of students regarding contents of dental records including personal details and diagnostic aids.

| Which contributed towards personal details of the patient | Intern | Final Year BDS | III year BDS | %     | P-value |
|----------------------------------------------------------|--------|----------------|--------------|-------|---------|
| Full Name                                                | 17     | 10             | 24           | 21.1% |         |
| Date of Birth & Age                                      | 7      | 8              | 9            | 9.9%  |         |
| Gender                                                   | 4      | 5              | 7            | 6.6%  |         |
| Contact details                                          | 0      | 0              | 1            | 0.4%  | 0.000*  |
| Complete postal address                                  | 0      | 11             | 0            | 4.5%  |         |
| Occupation                                               | 2      | 0              | 2            | 1.7%  |         |
| All of the above                                         | 53     | 43             | 39           | 55.8% |         |

Should diagnostic aids & their reports be recorded in patient’s file

|                                         | Intern | Final Year BDS | III year BDS | %     | P-value |
|-----------------------------------------|--------|----------------|--------------|-------|---------|
| Yes                                     | 71     | 59             | 52           | 75.2  | 0.004*  |
| No                                      | 12     | 18             | 30           | 24.8  |         |

Can reports of diagnostic aids be useful as an ante-mortem record

|                                         | Intern | Final Year BDS | III year BDS | %     | P-value |
|-----------------------------------------|--------|----------------|--------------|-------|---------|
| Yes                                     | 73     | 53             | 60           | 76.9  | 0.010*  |
| No                                      | 10     | 24             | 22           | 23.1  |         |

Table IV: Table showing the most perceived barriers to good dental record keeping, students perception on attending CDE programs and workshops on Forensic odontology and their take on relevance of forensic odontology for a successful clinical practice.

| Most perceived barrier to good dental record keeping | Intern | Final Year BDS | III year BDS | %     | P-value |
|------------------------------------------------------|--------|----------------|--------------|-------|---------|
| Lack of time                                          | 24     | 17             | 38           | 32.6  | 0.040*  |
| Lack of experience                                    | 18     | 22             | 16           | 23.2  |         |
| Lack of training program/CDE                         | 24     | 26             | 19           | 28.5  |         |
| Increased work load                                   | 17     | 12             | 9            | 15.7  |         |

Attended any CDE programs/Workshops regarding Forensic Odontology
**Cont...** Table IV : Table showing the most perceived barriers to good dental record keeping, students perception on attending CDE programs and workshops on Forensic odontontology and their take on relevance of forensic odontontology for a successful clinical practice.

|                          | Yes | 35 | 40 | 63 | 57% | 0.040* |
|--------------------------|-----|----|----|----|----|-------|
| **Do you think you need to know Forensic Odontontology in detail for your clinical practice** | No  | 48 | 37 | 19 | 43% |       |
|                          | Yes | 70 | 51 | 63 | 76% | 0.027*|
|                          | No  | 13 | 26 | 19 | 24% |       |

**Discussion**

Production, maintenance and release of accurate, legible, comprehensive, organized records is the ethical and legal obligation of a dentist, and hence this practice must be inculcated during the period of professional training of students. Very few studies have been done to evaluate the awareness of importance of dental records among undergraduate dental students, and hence this study was undertaken to do the same.

Hannah et al performed a cross-sectional institution based survey among undergraduate dental students and evaluated their knowledge, attitude and practice of forensic odontontology. They reported more than 80% of students had good knowledge about forensic odontontology, 82% of their participants pointed their source of knowledge to be from lectures and workshops in college and 83% of their students were interested to undergo formal training in the field. On the contrary, 50.8% of our study population believed that they did not have adequate knowledge regarding the subject and its various methods. 57% of our study population had attended CDE and workshops on the subject, whilst 76% of our students believed they needed to know forensic odontontology in detail to run an authentic clinical practice. Ignorance of forensic odontontology during the undergraduate level may be responsible for students having comparatively lesser knowledge in this aspect.

Kutesa et al conducted a qualitative cross-sectional study among 4th and 5th year undergraduate dental students to obtain information on the factors responsible for unsatisfactory state of dental records at the students clinic. Poorly designed clerking forms, inadequate storage space and poor maintenance of records were the factors attributed to this deficit, and according to them electronic system was deemed to be the ultimate solution to this problem. According to our study, lack of time was the most perceived barrier to good dental record keeping. In addition, factors like lack of experience, lack of training programme/CDE and increased work load were also responsible for this inadequacy. Our study also showed that interns and final years believed electronic dental records to allow faster accessibility and easy retrieval and hence had better understanding of dental record retrieval, a finding in accordance with the study of Kutesa et al.

Several studies have been done to assess the awareness of dental record maintenance among dental practitioners in India. Astekar et al conducted a cross sectional survey among practising dentists in Rajasthan, India and reported only 38% of the surveyed population maintained records. Preethi et al analyzed the knowledge, attitude and practice of forensic odontontology among dental practitioners in Chennai and reported 21% of the practitioners did not maintain records in their clinics, while only 12% maintained complete records in which 93% did not maintain them for more than seven years, thus concluding inadequate knowledge, poor attitude and lack of practice of forensic odontontology among the practitioners. Similar results were also reported by Harchandani et al and Sengupta et al from Pune and Ghaziabad respectively. On the contrary, Rahman et al reported an adequate level of knowledge, awareness and practice regarding forensic odontontology among dental surgeons in Bhubaneswar, Odisha. Ramesh et al from their cross sectional questionnaire survey concluded that knowledge of forensic odontontology among dental practitioners in Kanpur to be adequate, while lacking in the attitude and application of that knowledge. As many
undergraduate students go for clinical practice after their graduation, they should have adequate knowledge and right attitude to maintain dental records and thus should be inculcated during their training period.

Kannan et al assessed the knowledge and awareness on the application of prosthetics in forensic dentistry among dental practitioners in Chennai, and reported awareness amongst 62% of surveyed dentists. However, the acceptance and willingness was found to be very low. Our study revealed the percentage of knowledge regarding denture markers and role of implants to range between 65-70%. The field of forensic science could also benefit from the advent and incorporation of “Aadhar number - the unique identification number of Indian citizens”, in various prosthesis used in patient’s body and thus, help in the identification of an individual. Motivation and education on these grounds right from the training period of students are hence mandatory to promote their awareness, acceptance and application. Ours is the first study to explore the students knowledge in this context.

73.1% of the respondents in our study were aware that dentists were legally bound to maintain records in India, which could help in protection against any commercial, legal or medicolegal litigation. On the contrary, Astekar et al reported that none of the dentists in their study population were aware that it was legally mandatory to maintain records in India. However, the Indian Constitution under Article 51A(h) mandates the maintenance and preservation of medical, medicolegal and legal documents in the best interest of social and professional justice.

Patient records must formally document patient details, clinical findings, reports and treatment given, and these should be kept securely. Indian Law necessitates preservation of official records and documentation for a minimum of 8 years to avoid attracting penalties under Section 271 of Income Tax Act,1961. For legal suits, judicial records should be safeguarded for minimum 2 years in consumer cases, 3 years in civil cases and no time limit in criminal cases. The Indian Dental Association recommends that for practicability, a doctor may maintain records up to a minimum of 5 years to satisfy consumers and the judiciary, for protection against medical negligence and complications. According to 67.4% of our study population, dental records should be stored for a maximum of 5 years. But the Dental Council of India has not set any specific set of rules.

Conclusion
The result of the survey revealed the awareness on the importance of dental records in forensic human identification among BDS students. Few areas showed inadequate knowledge. Thus, there is an utmost need to train dental students to maintain good and adequate dental records as they are the future dental practitioners. Adequate time and guidance should be given to students for proper maintenance of records, so that the habit and attitude can be ingrained, which would prove to be beneficial in the longer run. Newer methods like denture marking and incorporation of Aadhar number in prostheses should be given importance.

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