

# QUALITY EVALUATION OF PAPER BASED DENTAL RECORDS KEEPING AT A TEACHING HOSPITAL IN A DEVELOPING COUNTRY

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## ABSTRACT

**Introduction:** The quality of dental records keeping is instrumental to the improvement of service delivery, thus adequacy of the records can guide quality assurance. The study evaluated the quality of dental records keeping by dentists at a single hospital in a developing country.

**Materials:** This was a retrospective review of the charts of patients seen at the Dental Out-patients Clinic of the University College Hospital, Ibadan over a six month period. The charts were reviewed for completeness of entries, status of the dentist as an intern or post registration dentist and statistical analysis performed using SPSS software.

**Results:** A total of 1060 charts were reviewed of which none contained all the necessary information. The most complete information was the identification data (99.4%) and the most incomplete was informed consent (100%). Post registration dentists were more likely than interns to make complete documentations of medication history ( $p = 0.038$ ), clinical findings ( $p = 0.003$ ), treatment plan (0.048) and medications administered (0.002).

**Conclusions:** There is a fair degree of adequacy of dental records keeping in the tertiary hospital studied in Ibadan, Nigeria. However, suboptimal recordings were noted in areas involving explanations by the dentist to the patient.

## INTRODUCTION

The patient's record is an essential component of dental practice that contain continuous documentation of oral conditions and treatment and it contributes to the diagnosis, planning and sequential delivery of care<sup>1,3</sup>. It also aids in the monitoring of disease progression and evaluation of the effectiveness of treatment instituted in the clinical setting. Furthermore, the forensic importance of dental records with its applications has been widely documented as invaluable in the correct identification of a victim<sup>4,5</sup>, which is dependent on the availability of accurate and comparable ante-mortem and post-mortem records<sup>7</sup>. Other functions of the patient's clinical records include; teaching, research, health and epidemiological, managerial, administrative and legal as well as in the auditing procedures for quality assurance<sup>1,3,8,9</sup>.

Although the functions that dental records serve in clinical practice are vital; there is a need for meticulousness in the recording of information, if those functions are to be carried out effectively. It has been shown that a poor record keeping system makes it difficult or impossible to evaluate the health care process<sup>8</sup>. Apart from this, accuracy is important in dental records keeping because it protects the patient as well as the dentist, since the records are the most valuable evidence in litigation processes involving the dentist. This, therefore, creates a need to constantly evaluate the quality of dental records. Although studies in other parts of the world had shown that record keeping in dental practice was hitherto inadequate<sup>10,11</sup>, the availability of electronic patient data recording systems have led to improvements in dental record keeping in those settings<sup>12</sup>.

Unfortunately, in developing countries, electronic records are not readily available and paper based systems are still in use. It is therefore not known if the records obtainable in such resource challenged settings are adequate in the face of increasing propensity for litigation, in an environment where such was foreign to our practice until recently<sup>13</sup>. In a bid to avoid these medico-legal issues and other benefits, many hospitals in the region have recently established quality assurance directorates with the goal of improving the quality of care across board. This study therefore aimed to evaluate the quality of dental records keeping by dentists at a University Teaching Hospital in a developing country, measured in terms of adequacy. The findings will provide a template for quality control in evaluation of dental records keeping in the region.

## METHODOLOGY

A retrospective audit was conducted on charts (case files) of patients seen at the Dental Out-patients Clinic of the University College Hospital, Ibadan, Nigeria between January and July 2011. The charts of the patients were retrieved from the Dental Records Department using a register containing the biodata of all the patients seen during the period listed by their chart numbers. Ethical approval to undertake the study was obtained from the

Institution's Ethical Review Committee.

### Data retrieved

Data retrieved from the charts of patients included; identification data (name, record number, age, gender, marital status, contact address), date of clinic consultation, presenting complaint, history of presenting complaint, medical history, drug history, dental history, clinical examination, radiologic findings, diagnosis, treatment plan, treatment done, medication prescribed and post treatment instructions. The status of the dentist that made the entry was also retrieved from the case record files in the particular months when the entries into the charts were made. The status was categorised as either a pre-registration intern or post registration qualified dental practitioner. In situations where a patient has multiple contacts with the clinic, the last major entry made into the chart was used for the purpose of this study.

Table 1: Criteria for complete data<sup>3,14</sup>

Data from record	Charted as complete if none of the information was missing:
Identification data	Patient's registration number, sociodemographic data, contact address
Date	Day, month and year that the patient was seen.
Presenting complaint	The patient's complaint
History of presenting complaint	All associated events with the patient's main complaint in full details
Medical history	Comprehensive medical evaluation, history of allergies
Drug history	Name of drug with dosage and if the patient is still on it. If so, was it taken prior to the consultation?
Dental history	Previous dental treatment; complications associated with such treatment if any.
Clinical examination	Extra-oral examination: general evaluation of the patient, evaluation for pallor, jaundice or cyanosis, TMJ. Intra-oral examination: adequacy of mouth opening, soft and hard tissue evaluation, dental status: charting of teeth present and teeth missing, fractured teeth, restorations and their state
Radiologic findings	Findings from the radiographs taken documented
Diagnosis	Written summary of the patient's condition
Treatment plan	Orderly arrangement of the treatment to be done for the patient
Informed consent	Written and duly signed by the patient and the dentist
Treatment done	Orderly arrangement of the procedure done, and documentation of any unusual event or complication during or immediately after treatment
Post treatment instructions	Documentation of the post treatment instructions either verbally or written
Medication prescribed	Name, dosage and duration of the medication prescribed
Recorders' status	Name and signature of the attending dentist

### Quality of recording

The data recorded in the charts were reviewed for completeness (Table 1) and evaluation performed based on the presence or absence of key aspects of the specific component of the recoding in the chart. The component was regarded as complete if the key aspects were present and incomplete if these were absent. The criteria used were adapted from previous publications<sup>3,14</sup> and presented in Table 1. Information on the key aspects that was not applicable or necessary as at the time of charting was expected to be documented as such with reasons given; this was adjudged to be complete. However, if this information was not documented in the chart as either not applicable or not necessary, that recording was regarded as incomplete.

### Data analysis

Recording of retrieved data was done and statistical analysis performed using SPSS version 17. Results were presented as proportions and percentages. Tests of associations were conducted between outcome measures (complete and incomplete medical records charting) and independent variables (different components of the charting as recorded by either pre registration interns or dentists) using Chi-square statistics and Fisher's Exact test (where appropriate). The p value for statistical significance was set at 0.05.

### RESULTS

A total of 1060 charts were retrieved during the study period. The majority (909, 90.0%) of recordings in the charts were done by qualified (post registration) dentists. None of the charts reviewed in the study contained all the information identified as necessary (Table 2). The most often recorded information were identification data (99.4%), presenting complaint (99.3%), the history of presenting complaint (99.3%) and the dental history (98.3%). The most incomplete information was in the sections relating to informed consent (100%), medications prescribed (62.4%), documentation of radiologic findings (39.3%) and post treatment instructions (37.1%). The findings on clinical examination of the patients as documented in the charts were regarded as complete in 97.6% for extra-oral examination, 96.8% for soft tissue examination and 82.3% for full tooth charting. Information on the type of material used to clean the teeth (a standard requirement in evaluating dental hygiene in the country) was documented in the charts of 534 (50.4%) patients.

**Table 2: Documentation of basic information of records**

Data retrieved	Complete (%)	Not complete (%)
Identification data	1054 (99.4)	6 (0.6)
Date	1020 (96.2)	40 (3.8)
Presenting complaint	1053 (99.3)	7 (0.7)
History of presenting complaint	1053 (99.3)	7 (0.7)
Medical History	1029 (97.1)	31 (2.9)
Drug History	1027 (96.9)	33 (3.1)
Dental History	1042 (98.3)	18 (1.7)
Clinical findings	1026 (96.8)	34 (3.2)
Radiologic findings	647 (61.0)	413 (39.3)
Diagnosis	981 (92.5)	79 (7.5)
Treatment plan	1001 (94.4)	59 (5.6)
Informed consent	0 (0)	100 (100)
Treatment done	811 (76.5)	249 (23.5)
Post treatment instructions	667 (62.9)	393 (37.1)
Medication prescribed	399 (36.3)	661 (62.4)
Recorders status	1010 (95.3)	50 (4.7)

### Recorder's status and completeness of records

A higher proportion of qualified dentists documented the drug history completely than pre-registration interns (97.8% vs. 94.1%,  $p = 0.038$ ). The clinical findings were more likely to be documented as required by qualified dentists as compared to pre-registration interns (97.9% vs. 92.1%,  $p = 0.003$ ). The proportion of qualified dentists (95.7%) who documented the complete treatment plan for the patient was higher than that of interns (91.1%) who documented similarly ( $p = 0.048$ ). The medications given to the patient were documented more often by qualified dentists than by interns (35.1% vs. 19.8%,  $p = 0.002$ ). There were no significant associations between the status of the recording dentist and completeness of recording of information on: identification data, presenting complaint, medical history, dental history, radiologic findings, the diagnosis, treatment done and documenting the post

treatment instructions (Table 3).

**Table 3: Recorder's status and documentation of basic information of records**

Patient data	Qualified Dentists Number (%)	Interns Number (%)	p-value
<b>Identification data</b>			
Complete	907 (99.8)	100 (99.0)	0.271
Not complete	2 (0.2)	1 (1.0)	(FET)
<b>Presenting complaint</b>			
Complete	906 (99.7)	101 (100.0)	1.000
Not complete	3 (0.3)	0 (0.0)	(FET)
<b>Medical history</b>			
Complete	891 (98.0)	97 (96.0)	0.266
Not complete	18 (2.0)	4 (4.0)	(FET)
<b>Drug history</b>			
Complete	889 (97.8)	95 (94.1)	0.038*
Not complete	20 (2.2)	6 (5.9)	(FET)
<b>Dental history</b>			
Complete	901 (99.9)	98 (97.0)	0.088
Not complete	8 (0.9)	3 (3.0)	(FET)
<b>Clinical findings</b>			
Complete	890 (97.9)	93 (92.1)	0.003*
Not complete	19 (2.1)	8 (7.9)	(FET)
<b>Radiologic findings</b>			
Complete	556 (61.4)	65 (64.4)	0.558
Not complete	350 (38.6)	36 (35.6)	
<b>Diagnosis</b>			
Complete	844 (93.1)	95 (94.1)	0.704
Not complete	63 (6.9)	6 (5.9)	
<b>Treatment plan</b>			
Complete	869 (95.7)	92 (91.1)	0.048*
Not complete	39 (4.3)	9 (8.9)	(FET)
<b>Treatment done</b>			
Complete	708 (78.0)	75 (75.0)	0.498
Not complete	200 (22.0)	25 (25.0)	
<b>Post treatment instructions</b>			
Complete	578 (63.7)	69 (68.3)	0.354
Not complete	330 (36.3)	32 (31.7)	
<b>Medications given</b>			
Complete	319 (35.1)	20 (19.8)	0.002*
Not complete	589 (64.9)	81 (80.2)	

FET – Fisher Exact Test, \* - Statistically significant

### DISCUSSION

The importance of proper record keeping in clinical dental practice has been widely documented<sup>1,3,8,9</sup>. The fact that good dental records protect both the dentist as well as the patient means that they are expected to be of good quality; having adequate information about the patient and the procedures done or the reasons why those were not done. The retrospective methodology used for this study was found appropriate as the dentists were not aware of this evaluation, therefore the findings reflected the normal process of patients' record documentation in this institution.

The results from this study showed that most (99.8%) of the dentists recorded the patients' identification data in the charts. This finding is similar to what was reported from other environments, although with a slightly higher proportion. Helminen et al.<sup>10</sup>, in a study conducted in Finland, reported that the patient's identification data was recorded in 90% of the patient-dentist interaction. Cole and McMichael<sup>14</sup> similarly found from a study in Worcestershire, UK, that 95% of the general dental practitioners surveyed met the prescribed standard in patient detail documentation. These would confirm the importance of the patient's identification detail in dental record keeping. The near complete documentation of the patients' details in the present study may, additionally, not be unconnected with the non-availability of computerised data archival prior to now in most hospitals in this region. There is, therefore a need to ensure that the patient's details are written on every page since that is the only way the documentation could be traced back to the patient's chart if the page falls out during transportation from one clinic to the other. This "survival" instinct appears to have turned out to be beneficial in this instance.

The medical history of the patient being seen by a dentist is often times important in the identification of co-morbid states, which can impact on oral health status; hence it is a vital aspect of the documentation. From this study, 98% of the recordings were regarded as adequate in terms of the content of the medical history. This agrees with the findings by Cole and McMichael<sup>14</sup> where over 90% of the responses obtained from dentists about the medical history of their patients were deemed to be adequate. Contrastingly, much lower figures were obtained from studies conducted in Finland<sup>10</sup> and in the Denplan Excel programme in the UK<sup>12</sup>. Helminen et al.<sup>10</sup> reported that a detailed medical history was recorded by dentists in the charts of only 26% of their patients. In the Denplan Excel programme, although there was an improvement in the recording of the medical history of patients following intervention (51% to 65%), the proportion of records containing this information was still below expectation<sup>12</sup>. The use of a simplified classification system in the present study could have contributed to the more favourable recording of the medical history compared to the use of a comprehensive and exhaustive questionnaire in the study conducted in Finland. The authors in the Denplan Excel programme attributed the suboptimal recording of the medical history, partly, to the method by which the data were gathered – the recall examination visits rather than initial treatment visits, where the medical history might have been documented, were used.

In the present study, most of the incomplete information was on informed consent, medications prescribed, radiologic findings and post treatment instructions. While some of the patients may not require some of these, there was a consistent failure to demonstrate that this was the case. Failure to record these components may or may not mean that the dentist has not performed the required task<sup>14,15</sup> but non-recording may be equally as important in a medico-legal case. These aspects are majorly verbal in nature and will suggest that there are deficiencies in the communication between dentists and patients.

The oral examination finding is the hallmark of the patient-dentist interaction. It is the basis, together with the history, on which a clinical diagnosis is made. In this study, the details of the extra-oral and soft tissue examinations were complete in most charts while a full charting of the teeth was documented in 82% of cases. This finding is similar to what was reported by Ireland et al.<sup>12</sup> in the Denplan Excel study where 85% of the dentists recorded the basic periodontal examination finding in the post pilot phase. The quality of documentation of oral examination findings is partly attributable to the importance attached to it in the litigation process and many dentists are conversant with the need to document the significant positives as well as negatives in the charts of their patients.

The influence of age or length of practice on completeness or otherwise of dental records is of considerable importance. In this study, the experienced dentists recorded most aspects of the interaction with the patients better than the interns although the level of statistical significance was attained in relation to the drug history, clinical findings, treatment plan and medications administered. This is not consistent with the findings from previous studies where younger dentists were reported to have documented more complete recording of the patients' data<sup>1,10,16</sup>.

The basis for categorisation of the dentists in the present study may be responsible for this finding; categorisation of dentists in our study was based on being a pre-registration intern or post registration dentist unlike in those studies where the age of the dentist and years of experience in dental practice were used. It could also be due to the fact that the interns are just getting acquainted with the practice of dentistry and are therefore more likely to omit important details of the interaction with patients.

A major limitation of the present study is the retrospective design, which did not allow us to obtain certain information about the dentists such as age, gender and length of practice. It also did not enable us to observe the patient-dentist interaction in real time where many verbal explanations would have been given that may not necessarily find their way into the charts of patients. These would be important in evaluating the overall quality of the patient-dentist interaction.

## CONCLUSION

The study has shown a fair degree of adequacy of dental records keeping using the pool of charts obtained from a single hospital in a developing country that is reliant on paper based system. Suboptimal recordings were noted in areas involving (verbal) explanations by the dentist to the patient. There were significant deficiencies in the recordings of interns and we recommend a greater supervision for this cadre of dentists.

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