

Survey of the Reasons for Dental Extraction in Eastern Nigeria

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Abstract

Background: Extraction of teeth is the commonest surgical procedure carried out in the dental surgery setting. **Aim:** The purpose of this survey was to identify the causes of teeth extraction in Eastern Nigeria. **Subjects and Methods:** Record forms for entering data and a self-addressed return envelope were distributed to 100 dental surgeons in Eastern Nigeria using a simple random selection. **Results:** Seventy-one (71; 71/100) dentists responded to the request and the total extractions carried out were 3998. There were 1508 (37.7%) extractions in males and 2490 (62.3%) in females with male-to-female extraction ratio of 1:1.7. In both male and female gender, there were more teeth extractions between the ages of 11 and 30 years. Extractions were recorded more in the lower social class (47.6%; 1903/3998). There were more extractions in the permanent (85.0%; 3398/3998) than deciduous (15.0%; 600/3998). The commonest reasons for teeth extraction were caries (55.2%; 2208/3998). **Conclusion:** The result of this study shows that dental caries is the commonest reason for tooth extraction in Eastern Nigeria. It is hoped that the study will facilitate the development of treatment and preventive procedures relevant to the problems observed in this part of Nigeria, thus minimizing the loss of teeth and its expected adverse consequences.

Keywords: Eastern Nigeria, Extraction, Reasons, Survey, Teeth

Introduction

Extraction of teeth is the commonest surgical procedure carried out in the dental surgery setting by the practicing dental surgeon.^[1] From a historical perspective, dental extractions have been used to treat a variety of diseased conditions, and as a method of severe punishment or torture to obtain forced confessions from suspected criminals.^[1-3] Also, before the advent of antibiotics, chronic tooth infections were sometimes linked to a variety of health-related problems and removal of such diseased tooth was therefore a common treatment option for various medical conditions.^[2] Likewise, it was once a common practice to remove the front teeth of institutionalized psychiatric patients who had a history of biting.^[3] Tooth mortality, which is mainly a

reflection of untreated dental caries and periodontal disease, is considered as a crude but useful measure for the dental status of a community.^[4] Causes of tooth extractions had large geographical and cultural differences between various regions in a country and from one country to another.^[4,5] Healthcare provision in Nigeria is a concurrent responsibility of the three tiers of government in the country.^[6] However, because Nigeria operates a mixed economy, private providers of healthcare have a visible role to play in healthcare delivery. In May 1999, the government also created the National Health Insurance Scheme (NHIS), which encompasses government employees, the organized private sector, and the informal sector. Legislative wise, the scheme also covers children under the age of 5 years, permanently disabled persons, and prison inmates. Eastern region of Nigeria comprises nine out of the 36 states of the federation, and it has a heterogeneous type of society. To the best of our knowledge, no previous study has been carried out in this area to determine the dental needs and treatment of her people, which may probably be a direct reflection of their oral health problems. The present study was therefore designed to study tooth mortality in this part of Nigeria.

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Subjects and Methods

Randomly selected 100 dentists, practicing in different localities in the Eastern part of Nigeria, were contracted to participate in this survey. The dentists were visited by the authors in their practice locations, and after discussing the purpose and modalities of the study were handed over a record form for entering the data and a self-addressed return envelope. Each of the participating dental surgeons was required, during a period of 1 month, to record the information on every tooth extracted. The information recorded in the record form included patient's age, gender, social class, tooth number, and the reasons for tooth extraction. The social class of the subjects was determined using Adedeji's classification of 1985. The reasons for tooth extraction were assigned to eight groups: caries, periodontal diseases, orthodontic, prosthetic, impaction, trauma, cosmetic, and others.

The record forms were given to the dental surgeons in January and February 2011, while the actual study commenced from March 1, 2011, and ended on March 31, 2011. This is usually the dry season period in this area and it was assumed that the greatest possible number of patients would be attending the various clinics and hospitals for treatment.

The record forms were returned by the dental surgeons at the end of the study, which were then checked to eliminate any record form that does not conform to the full information as required in the study design. Descriptive statistics and statistical analysis for significance were performed with EPI Info 2008 version software. Statistical testing was done with the Chi-squared test. *P* values less than 0.05 were considered significant.

Results

Seventy-one (71.0%) dentists responded to the request to enter data from their clinics and hospitals in the record form. The total number of record forms returned was 2458 (83.3%) out of 2950 distributed. Out of this, 23 (0.9%) record forms were not properly filled and therefore were not included in the data analysis. The total number of extractions carried out, with reason for each extraction, was 3998. This averages 1.6 extractions per patient. The age of patients ranged from 3 to 96 years, with mean age of 40.3 (9.2) years. There were 1508 (37.7%) extractions in males and 2490 (62.3%) in females with male-to-female extraction ratio of 1:1.7. In both male and female gender, there were more teeth extractions between the ages of 11 and 30 years than in all the other age categories [Table 1]. Likewise, more extractions were done in the young age categories than the intermediate and older age groups. Caries and periodontal diseases were the more frequent reasons for extraction in both the male and female gender [Table 2]. Also, more extractions were carried out in the intermediate and lower social class than in the higher

Table 1: Distribution of teeth extracted by age and gender

| Age (Years) | Gender | | | | Total |
|-------------|--------|-------|--------|-------|-------|
| | Male | | Female | | |
| | No. | % | No. | % | |
| 0-10 | 122 | 8.1 | 148 | 5.9 | 270 |
| 11-20 | 308 | 20.4 | 379 | 15.2 | 687 |
| 21-30 | 370 | 24.5 | 455 | 18.3 | 825 |
| 31-40 | 221 | 14.6 | 309 | 12.4 | 530 |
| 41-50 | 149 | 9.9 | 250 | 10.0 | 399 |
| 51-60 | 87 | 5.8 | 200 | 8.1 | 287 |
| 61-70 | 132 | 8.8 | 301 | 12.1 | 433 |
| 71-80 | 66 | 4.4 | 266 | 10.7 | 332 |
| 81-90 | 40 | 2.6 | 127 | 5.1 | 167 |
| 91-100 | 13 | 0.9 | 55 | 2.2 | 68 |
| Total | 1508 | 100.0 | 2490 | 100.0 | 3998 |

Table 2: Distribution of extracted teeth by gender

| Reason | Gender | | | | Total |
|---------------------|--------|-------|--------|-------|-------|
| | Male | | Female | | |
| | No. | % | No. | % | |
| Caries | 627 | 41.6 | 1581 | 63.5 | 2208 |
| Periodontal disease | 402 | 26.7 | 521 | 20.9 | 923 |
| Trauma | 188 | 12.5 | 37 | 1.5 | 225 |
| Prosthetics | 72 | 4.8 | 116 | 4.6 | 188 |
| Impaction | 97 | 6.4 | 77 | 3.1 | 174 |
| Orthodontics | 60 | 4.0 | 64 | 2.6 | 124 |
| Aesthetics | 19 | 1.2 | 68 | 2.7 | 87 |
| Cystic lesion | 22 | 1.5 | 12 | 0.5 | 34 |
| Benign neoplasm | 19 | 1.2 | 10 | 0.4 | 29 |
| Deliberate | 2 | 0.1 | 4 | 0.2 | 6 |
| Total | 1508 | 100.0 | 2490 | 100.0 | 3998 |

Table 3: Distribution of teeth extracted by type

| Type | Deciduous dentition | | Permanent dentition | | |
|-----------|---------------------|------|---------------------|------|------|
| | No. | % | Type | No. | % |
| Lower jaw | | | | | |
| 1 | 56 | 1.4 | 1 | 91 | 2.3 |
| 2 | 31 | 0.8 | 2 | 75 | 1.8 |
| 3 | 38 | 1.0 | 3 | 55 | 1.4 |
| 4 | 122 | 3.0 | 4 | 116 | 2.9 |
| 5 | 56 | 1.4 | 5 | 105 | 2.6 |
| | | | 6 | 503 | 12.6 |
| | | | 7 | 334 | 8.4 |
| | | | 8 | 225 | 5.6 |
| Upper jaw | | | | | |
| 1 | 63 | 1.6 | 1 | 155 | 3.9 |
| 2 | 52 | 1.3 | 2 | 107 | 2.7 |
| 3 | 21 | 0.5 | 3 | 71 | 1.8 |
| 4 | 60 | 1.5 | 4 | 162 | 4.0 |
| 5 | 99 | 2.5 | 5 | 117 | 2.9 |
| Total | 598 | 15.0 | 6 | 671 | 16.8 |
| | | | 7 | 392 | 9.8 |
| | | | 8 | 221 | 5.5 |
| | | | Total | 3400 | 85.0 |

social strata [Figure 1]. There were more extractions in the permanent (85.0%; 3398/3998) than deciduous (15.0%; 600/3998) dentition [Table 3]. Also, molar extractions were

more frequently done in both categories of dentition than the other types of teeth. In the deciduous dentition, 50.8% (304/598) teeth were extracted from the lower jaw while 49.2% (294/598) from the upper jaw; whereas for the permanent dentition, 44.2% (264/598) teeth were extracted from the lower jaw and 55.8% (334/598) from the upper jaw [Table 3]. The most common reasons for teeth extraction were caries (55.2%; 2208/3998) and periodontal diseases (23.1%; 924/3998), while the least reason was deliberate extraction (0.1%; 4/3998) [Table 4]. Table 5 revealed that caries, impaction, orthodontic, aesthetic, and trauma contributed more to extractions in the younger age while periodontal diseases were more frequent in the older age groups.

Discussion

Several authors^[1-5,7,8] worldwide have recorded reasons for teeth extractions in their different localities and countries. Likewise, some researchers^[9-11] in other regions of Nigeria have also published their findings on reasons for teeth mortality. A critical scrutiny of these results shows that there have been considerable variations in their findings as regards the most important etiological factors responsible for teeth mortality. Also, one should be cautious in the extrapolation of results from these studies, as some of them considered only permanent teeth while others reported on both deciduous and permanent dentition. This study evaluated data from both

deciduous and permanent dentition and revealed that both dental caries (55.2%) and periodontal diseases (23.1%) are the main causes of teeth extraction in Eastern Nigeria. This result is comparable to earlier studies in Western Nigeria^[10,11] and other parts of the world.^[5,12] This may be due to transition from the customary fibrous diet to western diet.^[9-11] These researchers have shown from their studies that the incidence of dental caries and periodontal diseases are on the increase as refined sugar, fruit drinks, and sweet have become readily available in Nigeria. Other reasons identified for extraction of teeth in this study have been reported earlier by other researchers.^[2,5,8,13] Deliberate extractions (0.1%) were those suggested by patients and performed at their request rather than by the dental surgeon. Such deliberate extraction was reported by Hassan (42.0%)^[12] in his pilot study and was due to the patients refusing other treatment options as suggested by the dentist. The benign neoplasms encountered in the present study were ameloblastoma, fibrous dysplasia, ossifying fibroma, peripheral and central giant cell granuloma, and compound and complex odontome. The cystic lesions recorded include periodontal, dentigerous, and calcifying odontogenic. More extractions were carried out in the female (62.3%) population than males (37.7%). This may be attributed to the universal belief that females usually attend dental clinics more than males and are therefore more conscious of their health-related

Table 4: Distribution of reasons for teeth extraction

| Reasons | No. | % |
|----------------------|------|-------|
| Caries | 2208 | 55.2 |
| Periodontal diseases | 923 | 23.1 |
| Trauma | 225 | 5.6 |
| Prosthetics | 188 | 4.7 |
| Impaction | 174 | 4.4 |
| Orthodontics | 124 | 3.1 |
| Aesthetics | 87 | 2.2 |
| Cystic lesions | 34 | 0.9 |
| Benign neoplasm | 29 | 0.7 |
| Deliberate | 6 | 0.1 |
| Total | 3998 | 100.0 |

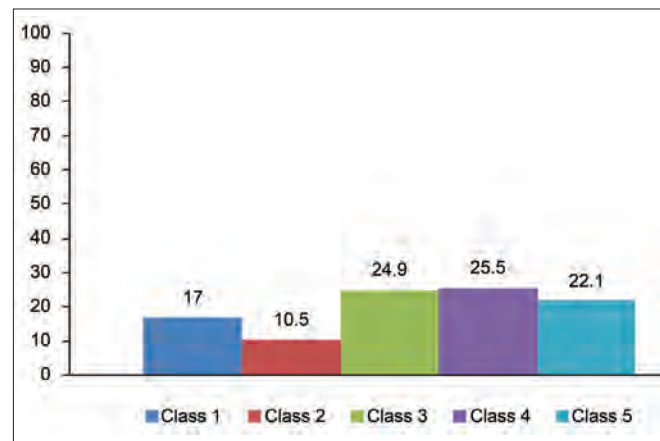


Figure 1: Distribution of extracted teeth by social class

Table 5: Distribution of reasons for teeth extraction by age

| Age (yrs) | Reasons for teeth extraction | | | | | | | | | | |
|-----------|------------------------------|-------|--------|--------|--------|-------|-------|--------|----|-------|------|
| | Caries | Perio | Trauma | Impact | Prosth | Ortho | Aesth | Cystic | BN | Delib | T |
| 0-10 | 176 | 2 | 47 | 0 | 0 | 35 | 0 | 10 | 0 | 0 | 270 |
| 11-20 | 499 | 21 | 56 | 23 | 14 | 66 | 3 | 5 | 0 | 0 | 687 |
| 21-30 | 616 | 33 | 65 | 44 | 6 | 20 | 25 | 7 | 4 | 5 | 825 |
| 31-40 | 312 | 64 | 13 | 59 | 42 | 3 | 31 | 0 | 6 | 0 | 530 |
| 41-50 | 192 | 116 | 19 | 30 | 13 | 0 | 15 | 9 | 4 | 1 | 399 |
| 51-60 | 86 | 108 | 21 | 13 | 53 | 0 | 6 | 0 | 0 | 0 | 287 |
| 61-70 | 142 | 234 | 4 | 5 | 37 | 0 | 6 | 3 | 2 | 0 | 433 |
| 71-80 | 131 | 187 | 0 | 0 | 8 | 0 | 1 | 0 | 5 | 0 | 332 |
| 81-90 | 45 | 103 | 0 | 0 | 12 | 0 | 0 | 0 | 7 | 0 | 167 |
| 91-100 | 9 | 55 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 68 |
| Total | 2208 | 923 | 225 | 174 | 188 | 124 | 87 | 34 | 29 | 6 | 3998 |

Perio: Periodontal disease, Impact: Impaction, Prosth: Prosthetics, Ortho: Orthodontics, Aesth: Aesthetics, BN: Benign neoplasm, Delib: Deliberate, T: Total

problems.^[14,15] However, this contrasts the result of Hassan^[12] who recorded more males (68.0%) than females (32.0%). The need for extraction of teeth due to caries, orthodontic, and trauma decreased with advancing age, while that due to periodontal diseases increased with age. These patterns may reflect the contrasting natural history of both dental caries and periodontal disease.^[4] Extractions were recorded more in the lower (47.6%) than in the higher social class (27.5%). This report is similar to the findings of Hassan^[12] who recorded more extractions in uneducated patients (53.0%) and only 12.0% among university graduates. A study^[16] in Australia showed that attendance for emergency treatment is experienced by socio-economically disadvantaged individuals who have delayed attendance at the appropriate time. This resulted in such individuals having extractions more than restorative and preventive treatment. Also, studies^[17,18] done in Scotland, where extractions are relatively common, revealed that irregular attendance to the dental clinic was a contributor to high morbidity rates. This may explain why regular dental visits would be the best way of reducing need for the more invasive and therefore more uncomfortable procedures such as extractions.^[19] In both dentitions, the molars and premolars were extracted more frequently than the anterior teeth. This is explained by the presence of pits and fissures in these sets of teeth, which cause more retention of plaque in them. The morphology, time of eruption, and positioning of tooth in the oral cavity confers an inherent disadvantage or advantage to the various methods employed in the control of plaque, and hence teeth decay and loss.^[9] Also, the reason for decreased teeth mortality in the mandibular anterior region than in the maxillary component may be due to the close proximity of the submandibular and sublingual salivary glands duct in this part of the mouth, as their secretions help to buffer and cleanse the products of bacterial plaque. Retention of a complete dentition throughout life should be one of the main goals of the dental profession.^[4] Also, extending the life span of the dentition, either by preventive or conservative treatment of dental diseases, is a major objective of dental care. However, dental caries and periodontal diseases among others are the main obstacle to achieving this goal in Eastern Nigeria. Various methods are available to prevent or decrease the adverse effects of these diseases. Community water fluoridation is one of the most cost-effective methods for preventing teeth decay. Several studies^[20,21] worldwide have recorded dental caries reduction of 40-50% in deciduous dentition and 50-65% in permanent teeth. Increasing the number of dentists and dental auxiliaries is also important for both prevention and treatment of oral diseases.^[4] Likewise, dental hygienists, including therapists and dental nutritionists, would help in the development of a sound oral hygiene and dietary modification, which in effect will reduce the incidence of dental caries and periodontal diseases. The result of this study will, therefore, facilitate the development of an approach in treatment and preventive procedures relevant to the problems observed in this part of Nigeria, thus minimizing the loss of teeth and its expected adverse consequences.

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