FACTORS AFFECTING TOOTH EXTRACTION AMONG ADULT DENTAL PATIENTS IN SANDEMAN PROVINCIAL HOSPITAL, QUETTA - PAKISTAN

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ABSTRACT

A cross-section study was conducted among 205 adult dental patients, at Sandeman Provincial Hospital, Quetta in 1999. The objective of the study was to determine the factors affecting tooth extraction among adult dental patients. It observed the attitude and practice of the patients and perception of the dentists utilizing face-to-face interview techniques and determined the oral disease status, particularly periodontal attachment loss using crystal violet solution.

The results showed that the extraction cases (n=134) were older than non-extraction cases (n=71), (p=0.001). The educational level was higher, (p=0.001) and the number of teeth present in oral cavity was also higher in non-extraction cases, (p=0.001). The dental caries was the main cause of tooth extraction (77.6%). There was higher proportion of dental caries in extraction cases than non-extraction cases but statistically not significant. The knowledge attitude and practice score was better in non-extraction cases than extraction cases, (p=0.001). Most of the dentists perceived that patients got their teeth due to extracted lack of knowledge and were not interested in other treatment. Seventeen percent of the patients were suffering from periodontitis.

In conclusion, the finding suggested that the dental caries was the major cause of tooth extraction, the majority of the patients were of older age group, had lesser number of teeth present, were less educated and had low KAP score as compared to non-extraction cases. Preventive and promotive programs were highly recommended.

Key Words: Tooth Extraction, Dental Caries, Periodontitis, Quetta

INTRODUCTION

Tooth retention in 1990s is much improved in all developed countries. Changes came about with improvements in restorative dentistry, increasing affluence and its accompanying improvement in attitudes towards tooth retention and significant research advances in preventing oral diseases. But the tooth loss is still an alarming problem in developing and under developed countries. Dental epidemiology is useful in...
determining the needs of the population. Dental diseases vary from country to country, indeed, from community to community's.

Thus tooth extraction is the result of disease-related, and attitude-related causes, and/or their interactions\(^3\,\text{to}\,\text{30}\). No single characteristic was measured for a predominant amount of variation in causes of tooth extraction. Because of the apparently multifactor etiology of tooth extraction, all these factors should be included in any study of tooth extraction. The aim of this study was to determine the causes for tooth extraction in Quetta city.

Number of studies conducted in many countries, and among different types of population, have been virtually unanimous in finding that caries is the principal cause of tooth loss at almost all ages \(^3\,\text{to}\,\text{12},\text{29}\), with the exception of some of the studies\(^6\,\text{to}\,\text{11}\). Differences in these findings may reflect cultural differences in habits, diet, socio-economic status and dental health services system.

Luan et al\(^12\) found that rural residents had more teeth indicated for extraction due to caries than urban residents. Beyond the age of 50 years the number of teeth requiring extraction were due to periodontal disease and the number was higher in urban people than of the rural persons and the number was higher in women than in men. Burt et al\(^13\) showed that the persons with greater tooth retention were generally of higher socio-economic status, and showed superior oral hygiene. OHI-S is consistently better for women than men at all levels of tooth retention, but overall pattern for men and women separately is the same. Akanayaka's\(^15\) study showed that in Sri Lanka more female than male were edentulous, a notable feature of the results was that the age specific edentulousness was consistently less as compared to populations in the U.K., USA, New Zealand, Norway and Germany. Besides gender and age, ethnicity may be one of the contributing factor\(^14\).

Davidson et al\(^16\) demonstrated that socio-behavioral determinants of oral hygiene were examined across several dentate ethnic and age groups. Many of the studies\(^6\,\text{to}\,\text{25}\) suggested that disease related factors (e.g., caries, periodontal attachment loss, and trauma) could not adequately predict tooth loss, and suggested that social, attitudinal, and behavior factors are likely to have significant impacts.

Moreover, research demonstrated that non-dental factors are important in dentists' decisions\(^27\,\text{to}\,\text{28}\). There is a communication gap between dentists and patients, with dentists ascribing the main problem to patients\(^27\,\text{to}\,\text{28}\), as well as the dentist's attitude to give education to the patients.

**MATERIALS AND METHOD**

A cross-sectional study was performed in Sandeman Provincial Hospital, Quetta. The hospital is the only teaching hospital in Quetta, and serves the patients of the province as well as the patients from Afghanistan. The patients who attended the out-patients department of Sandeman Provincial Hospital Quetta, during Jan and Feb 1999 were 25-65 years old.

The exposure variables of interest were dental caries, periodontal disease, socio-demographic variables of patients such as gender, caste, occupation and education. The measurement of dental caries and periodontal disease was done on extracted teeth which have been stained with crystal violet. The KAP of the patients was determined by using fact-to-fact interview. The knowledge attitude and practice score lowers or equal to mean was considered as low and higher than mean was considered high. In addition, using fact-to-face interview assessed dentist's perception. For outcome measurement, the patients’ dental records from the hospital and laboratory findings were assessed.

**Laboratory procedure**

The dental caries and periodontal status was measured on extracted teeth. After identification of extracted teeth, periodontal status and dental caries was assessed. The periodontal status was measured by the loss of attachment. The extracted teeth were rinsed in running water to remove blood, and then tooth was fixed in 10% formalin before staining. After one minute staining in crystal violet, the tooth was rinsed with running water for 10-15 min and air-dried.\(^{31}\) Loss of attachment was expressed in term of the percentage of the root length no longer covered by periodontal fibers. All four surfaces were measured by a periodontal probe and the most severely affected surface determined the loss of attachment of the tooth. A loss of attachment of 50% or higher was chosen as the level at which advanced periodontal disease was considered to be present\(^31\). The dental caries was assessed visually and
measured as enamel caries, dentinal caries with pulp involvement and root caries. Broken root after extrac-
tion was excluded for laboratory data. From a total of
134 cases, 125 cases were included for the laboratory
analysis.

Data analysis was conducted using the Statistical
Program of Social Science (SPSS version 7.5). First a
total of 205 subjects were included in the analysis.
Descriptive statistics such as mean, median and fre-
quency distribution was used to describe the socio-
demographic characters, clinical examination. Then
extraction and non-extraction cases were compared for
socio demographic characters, clinical examination
and KAP score using Chi-square test and t-test. In
addition, multiple logistic regression was used to ex-
amine determines of tooth extraction simultaneously.
Finally, 125 extracted cases were analyzed and de-
scribed the oral disease status, which were determined
in vitro using frequency distribution.

RESULTS

Out of 205 patients, 134 were extraction cases and
71 were non-extraction cases. The average age was 37
years old. There were 64% male and 36% female and the
proportion of Pathan patients (61%) was the highest as
compared to other castes. More than half of the patients
had their earning less than Rs. 3000/- per month and
had education less than five years of schooling. The
average number of missing teeth was approximately 5
teeth. As shown in Table 1, overall extraction cases were
older than non-extraction cases (p=.001). The average
number of missing teeth was higher in extraction cases
as compared to non-extraction cases (p=.001). Educa-
tion of less than five year was more often found
among extraction cases than among non-extraction
cases, (p=.001). The high proportion of extraction cases
(76%) have low KAP score, and the patients with low
KAP score were 4.9 times more likely to have their teeth
extracted as compared to those with high KAP score
(p=.001). There was a higher proportion of dental caries
as a chief complaint in extraction cases as compared to
those in non-extraction cases but not statistically
significant (p=.141), as shown in Table 2. However
multivariate analysis was shown that dental caries as a
chief complaint was significant contribution to the tooth
extraction after adjusting for age, education and number
of missing teeth, as shown in Table 3. The patients who
perceived that extraction is the only
treatment were higher in extraction cases (74%) as
compared to non-extraction cases, (p=.001). The pro-
portion of patients with bad previous experience was
also higher in extraction cases (70%) as compared to
non-extraction cases (p=.002). All the dentists (n=16)
agreed that those patients who got their teeth ex-
tracted believed that no other treatment was
possible. Most of the dentists (94%) reported that
patients who got their teeth extracted fought improper curative treatment was provided to them in
the past. Half of the dentists claimed that patients
were not interested for dental education. As shown
in Table 4, dental caries was the main cause of tooth
extraction (77.6%). Tooth extraction due to
periodontists was 16.8% and 5.6% from other
diseases. Comparing dentists diagnosis with the
condition of the extracted teeth as assessed in the
laboratory afterwards, it appears that dental caries
was the major cause of tooth extraction among all
age groups and was higher in younger age group.

DISCUSSION

Our study showed that the extraction cases were
older and less number of teeth were present in their
mouth and they were less educated as compared to
non-extraction cases. Razaq's23 and Chauncey's4
studies also agreed that educational status showed
significant differences between those subjects with or
without extraction. Our study showed that there is no
difference between Urban and Rural population
regarding tooth extraction. Moreover, there is no
difference among gender between extraction and non
extraction cases. Burt et al13 also suggested that the
overall pattern of tooth retention for men and women is
the same, but the studies done by Luans's12 and
Ekanayaka's15 showed that edentulousness were more
frequently seen in women than in men. This difference
may reflect sample differences.

Research16,19 demonstrated that the presence or
absence of natural teeth significantly depended on oral
health behaviors. The patients who came for extraction
in our study, had lessor knowledge attitude and prac-
tice (KAP) as compared to the patients who came for
other treatments and the findings in the present study
agreed with the previous findings.

Patients and dentists perception also plays an
important role towards tooth loss. Kiyak's25 study
TABLE 1. GENERAL CHARACTERISTICS AMONG TOOTH EXTRACTION AND NON-TOOTH EXTRACTION CASES IN SANDEMAN PROVINCIAL HOSPITAL, QUETTA (n=205)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Extraction cases n=134</th>
<th>Non-extraction case n=71</th>
<th>p — Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Mean± sd)</td>
<td>39.41 ± 11.68</td>
<td>33.55 ± 8.75</td>
<td>.001</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (Percentage)</td>
<td>63</td>
<td>66</td>
<td>.609</td>
</tr>
<tr>
<td>Urban (Percentage)</td>
<td>53</td>
<td>49</td>
<td>.615</td>
</tr>
<tr>
<td>Number of missing teeth (meant ± sd)</td>
<td>5.59 ± 7.01</td>
<td>2.45 ± 4.36</td>
<td>.001</td>
</tr>
<tr>
<td>Education &lt; 5 years (Percentage)</td>
<td>66</td>
<td>35</td>
<td>.001</td>
</tr>
</tbody>
</table>

TABLE 2. COMPARISON OF KAP OF PATIENTS AND DENTAL CARIES AS A CHIEF COMPLAINT AMONG TOOTH EXTRACTION AND NON-TOOTH EXTRACTION CASES IN SANDMAN PROVINCIAL HOSPITAL, QUETTA. (n=205)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Extraction cases</th>
<th>Non-extraction cases</th>
<th>OR (95% CI)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>KAP score lower than mean score</td>
<td>76%</td>
<td>39%</td>
<td>4.895 (2.63-9.09)</td>
<td>.001</td>
</tr>
<tr>
<td>Dental caries as a chief complain</td>
<td>77.6</td>
<td>69</td>
<td>1.626(.849-3.11)</td>
<td>.141</td>
</tr>
</tbody>
</table>

TABLE 3. FACTORS CONTRIBUTING TO TOOTH EXTRACTION AMONG DENTAL PATIENTS IN SANDEMAN PROVINCIAL HOSPITAL QUETTA USING MULTIPLE LOGISTIC REGRESSION.

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>OR (95%CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental caries</td>
<td>1.20</td>
<td>.0047</td>
</tr>
<tr>
<td>Education &lt; 5 years</td>
<td>1.04</td>
<td>.0014</td>
</tr>
<tr>
<td>Age</td>
<td>.042</td>
<td>.0339</td>
</tr>
<tr>
<td>Number of missing teeth</td>
<td>.084</td>
<td>.040</td>
</tr>
</tbody>
</table>

TABLE 4. COMPARISON OF CAUSES OF TOOTH EXTRACTION AS DIAGNOSED BY DENTISTS AND IN VITRO DETERMINATION OF EXTRACTED TEETH IN SANDEMAN PROVINCIAL HOSPITAL, QUETTA (n=125)

<table>
<thead>
<tr>
<th>Oral Diseases</th>
<th>As diagnosed by dentists in n</th>
<th>In vitro determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental caries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Periodontitis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Diseases</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
about dental beliefs, behaviors and health status among Pacific Asians and Caucasian's showed that Asians felt that there was little one could do about dental problems. In our study, the patients because of their traditional belief thought that the extraction is the best treatment of the diseased teeth. Their number was also statistically significantly higher in extraction cases as compared to the non-extraction cases. The patients with bad previous experience of dental treatment, particularly restorative treatment were also more in extraction cases as compared to the non-extraction cases.

Moreover, this study showed that all of the interviewed dentists perceived that many patients got their teeth extracted due to lack of knowledge about other treatment possibilities or due to bad previous experiences. Bouma's study also showed that in 43% of the cases dentists gave non-disease reasons for total tooth extraction instead they used words like patients not motivated, "patients not interested", 'financial problems". In present study half of the dentists informed that the patients were not interested, seventy five percent reported that they have too many patients per day, sixty two percent claimed that they have no time to give education to the patients. More than half of them also reported that facilities other than extraction were not available in the hospital.

Our study also confirmed that dental caries was the primary cause of tooth extraction in all age groups. Distribution of extracted teeth showed that 77.6% of extractions were due to dental caries. A series of studies from a number of countries, and among different types of populations have been virtually unanimous in finding that caries is the principal cause of tooth extraction at almost all ages. The Periodontitis was 16.8% of all extracted teeth as diagnosed by the dentists and the result is similar with Chauncey's findings. However, during vitro measurement it was found that out of 21 teeth which were extracted due to Periodontitis, 62% had loss of attachment less than 50%, which means that those extracted teeth could have been treated by periodontal therapy. In addition, the majority of misdiagnosed patients were of older age and this may have been due to traditional concept among dentists that the progression of periodontitis increases with age. Klock's study had similar findings in Norway. Of 93 teeth for which dentists' reason for extraction included periodontal consideration, approximately half of the extracted teeth had less than 50% of attachment loss. The rest had only dentinal caries, which could have been restored by simple fillings.

There is a need to improve the dental care services in this hospital as more than half of the dentists working in the hospital informed that facilities except extraction equipment are lacking.

In this regard, designing effective dental care messages are highly recommended which should be initiated in the community to modify the patient's beliefs regarding tooth extraction. Furthermore research is needed to identify patients at higher risk for tooth extraction with seasonal variation as well as to explore further the dissemination of dental health information aiming at increasing positive attitude towards tooth retention.

REFERENCES


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