# Reasons underlying the extraction of permanent teeth in patients attending Peoples Dental College and Hospital

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## ABSTRACT

Extraction of permanent teeth is common in Nepal. The study was undertaken to determine the causes and pattern of missing permanent teeth among patients attending Peoples Dental College and Hospital (PDCH) and to see if there is any association between variables like socio economic status, patient education level, dental visit and extraction of permanent teeth. A prospective cross sectional survey was carried out in patients attending the Department of Oral Surgery in PDCH between August 2006 and October 2006. The data was collected by trained clinician through clinical examination and using semi- structured questionnaires. Computer software SPSS 15 was used for statistical analysis. In age groups ≤ 30 years, 90.0% it was reported that Dental caries was the most common reason for extraction of teeth. In age groups > 30 years, 55.6% periodontal disease was the most common reason for extraction of teeth. Distribution by type of teeth and dental disease was highly significant where. Dental caries was the reason for extraction of first permanent molar. Distribution by education level and visit to dentist was highly significant. About 93.1% of the people who were illiterate visited the dental surgeon while in pain and 76.0% of the university level graduates visited the dentist while in pain. Caries and its sequel remain the most important cause of tooth loss throughout adult life along with periodontal diseases at later stages.

**Keywords:** Teeth extraction, dental caries, periodontal disease.

## INTRODUCTION

Poverty is the world's biggest killer.[1] Dental diseases and periodontal diseases are a major public health problem in low income nations. The burden of dental caries is increasing in the developing countries whereas there is a decline in dental caries in the developed world.[2] As a result, loss of teeth due to dental caries and periodontal diseases are very common in developing countries whereas the number of edentulous patients have been declining in the developed countries.[3] However, retention of teeth is important for social, functional, psychological and economical reasons. Both dental caries and periodontal diseases can be prevented and treated in time. In the developing countries and socially and economically marginalized communities, restoration of teeth may be expensive and extraction may be the easier alternative in terms of finances and time. While dental caries is the main cause for tooth loss; periodontal disease also contributes to loss of teeth at later stages of life. Studies have reported tooth loss and its association with age groups, dental visit pattern and socioeconomic status in both adults and children.[4] The Adult Dental Health Survey in Scotland has also reported extraction of teeth associated with factors like socioeconomic status, dental visit pattern.[5] Studies have also reported dental caries and periodontal disease to be the main reasons behind extraction of teeth.[6-8]

WHO states good oral health as an indicator of good health and one of the global goals to be achieved by the year 2000 is 85% of the population should have all teeth by the age of 18 years.[9] Dental caries and periodontal diseases being highly prevalent in developing countries are a major public health problem. In the 2004, National Pathfinder survey reported that, dental caries in the deciduous dentition, especially in young children attending urban schools, was still above recommended targets, thus making dental caries one of the most prevalent childhood diseases (67.0%) in Nepal. The study also reported untreated dental caries having an effect on the quality of life leading to pain and loss of teeth. Amongst adolescent schoolchildren, the most frequently reported impact of pain and discomfort was the inability to eat, followed by the inability to speak.[10] In the rural areas an appreciable number of children are affected with dental caries with treatment needs reaching almost 90.0-100%. The average cost of restoring a tooth with silver amalgam in a single cavity would be approximately Rs. 300 – 350. All services are on a fee for service basis. In some public hospitals the cost of amalgam filling may be as low as Rs100 and simple

**Table-1:** Distribution by reasons for the extraction of tooth.

| Reasons for extraction | frequency | Percentage |
|---|---|---|
| Extraction due to dental caries | 129 | 45.7 |
| Extraction due to periodontal problem | 110 | 39.0 |
| Extraction due to failure of endodontic treatment | 5 | 1.8 |
| Extraction due to fracture of teeth | 3 | 1.1 |
| Extraction due to impaction of teeth | 12 | 4.3 |
| Extraction due to orthodontic problem | 8 | 2.8 |
| Extraction due to prosthodontic purpose | 6 | 2.1 |
| Extraction due to supernumerary teeth | 2 | 0.7 |
| Extraction due to over retained teeth | 6 | 2.1 |
| Extraction due to aberrant position of teeth | 1 | 0.4 |
| Total | 282 | 100 |

**Table-2:** Distribution by sex group and dental diseases

| Age group | Type of dental diseases | | | |
|---|---|---|---|---|
| | Dental caries | Periodontal | Other | Total |
| Male | 55 (43.7) | 55 (43.7) | 16 (12.6) | 126 (46.0) |
| Female | 74 (47.4) | 55 (35.3) | 27 (17.3) | 156 (54.0) |
| Total | 129 (45.7) | 110 (39.0) | 43 (15.3) | 282 (100.0) |

p = 0.2549 (insignificant). Chi-square test was used to find 'p' value.

extraction may be as less as Rs.10 to as much as Rs.100. It was reported in 2005 that 36.0% of the population then lived atlest 2 hours away from the nearest road where public transportation is available.[11] Expenses for transportation, accommodation and food may make dental treatment more expensive for most Nepalese people living away from health care services especially in the hills and mountains. Reasons underlying loss of teeth due to extraction could be useful in introducing national level preventive strategies like school based oral health programs, community education program, salt fluoridation, allocation and availability of dental resources.

## MATERIALS AND METHODS

A cross sectional study was conducted in a sample population of patients attending the Department of Oral Surgery in Peoples Dental College and Hospital (PDCH) for extraction from 2006-8-23 to 2006-10-3. Patients are referred to the Department for extraction due to various reasons. Some of which may be dental caries and its sequel, periodontal disease, orthodontic reasons, failed restorations, impacted teeth, trauma etc. Clinical examination was conducted in each patient using a mouth mirror and probe. Findings of existing radiographs were also recorded to see the severity of dental caries and periodontal disease. For each patient, age and gender, type of tooth extracted, reasons for tooth extraction and caries and its sequel (pulpitis, crown failure, cellulites/abscess, restorative and endodontic failure), periodontal disease, orthodontic reasons, prosthetics, surgical indications, tooth injury was clinically examined and recorded. Questionnaires on educational level, dental visit pattern, barrier to utilization of dental services were given to the patients. Questionnaires were received and data collected were statistically analyzed to see if there is any association between variables like patient's education level, age and sex, dental visit and extraction of permanent teeth. Chi-square test was applied to see the significance differences and 5% level of significance was the standard p -value. For data analysis computer software SPSS 15 was used.

## RESULTS

The study sample comprised of total of 239 patients visiting PDCH. 45.7% of the teeth were extracted due to dental caries whereas 39.0% had teeth extracted due to periodontal disease (Table-1). About 46.0% of the study subjects were males while females formed 54.0% of the study subjects (Table-2). Distribution by age group and dental diseases was highly significant with p = 0.0000. Out of 50 subjects, 90.0% of the subjects in age groups 30 years and below had teeth extracted due to dental caries. Out of 189 subjects, 55.6% of the subjects who were more than 30 years of age reported to have teeth extracted due to periodontal diseases (Table-3). No significant difference was seen between gender, male

**Table-3:** Distribution by age group and dental diseases.

| Age group | Type of dental diseases | | |
|---|---|---|---|
| | Dental caries | Periodontal | Total* |
| ≤ 30 years | 45 (90.0) | 5 (10.0) | 50 (20.9 ) |
| > 30 years | 84 (44.4) | 105 (55.6) | 189 (79.1) |
| Total | 129 (54.0) | 110 (56.0) | 239 (100.0) |

* 43 cases of other dental diseases is not included because no age recorded

p = 0.0000 (highly significant). Chi-square test was used to find 'p' value.

**Table-4:** Distribution by sex group and dental diseases

| Age group | Type of dental diseases | | | |
|---|---|---|---|---|
| | Dental caries | Periodontal | Other | Total |
| Male | 55 (43.7) | 55 (43.7) | 16 (12.6) | 126 (46.0) |
| Female | 74 (47.4) | 55 (35.3) | 27 (17.3) | 156 (54.0) |
| Total | 129 (45.7) | 110 (39.0) | 43 (15.3) | 282 (100.0) |

p = 0.2549 (insignificant). Chi-square test was used to find 'p' value.

**Table-5:** Distribution by type of teeth extracted and dental diseases

| Teeth extracted | Type of dental diseases | | |
|---|---|---|---|
| | Dental caries | Periodontal | Total* |
| Central incisors | 4 (12.1) | 29 (87.9) | 33 (100.0) |
| Lateral incisors | 2 (11.8) | 15 (88.2) | 17 (100.0) |
| Canine | 3 (12.5) | 21 (87.5) | 24 (100.0) |
| First premolar | 6 (28.6) | 15 (71.4) | 21 (100.0) |
| Second premolar | 20 (54.1) | 17 (45.9) | 37 (100.0) |
| First molar | 41 (66.1) | 21 (33.9) | 62 (100.0) |
| Second molar | 34 (59.6) | 23 (40.4) | 57 (100.0) |

p=0.0000 (highly significant). Chi-square test was used to find 'p' value

(n=126) and female (n=156) and dental diseases where p = 0.2549 (Table-4). Distribution of type of teeth extracted and dental disease was highly significant with p = 0.0000. Out of the extracted teeth, First permanent molar, 66.1% was extracted due to dental caries and its sequel and extraction due to periodontal disease was common in central incisors 87.9% (Table-5). Although it was observed for patients with less than secondary school education to have more dental caries and periodontal disease; distribution by education level and dental diseases was insignificant where p = 0.1049 (Table-6). However distribution by education level and visit to dentist was significant with p=0.02927. The subjects who were illiterate, 91.5% visited the dental surgeon only while in pain compared to 76.0% of university graduates (Table-7). Overall, caries and its sequele was the most frequent reason for tooth extraction, followed by periodontal disease, surgical indications, orthodontic and prosthetic reasons.

**Table-6:** Distribution by education level and dental diseases.

| Education level | Type of dental diseases | | | |
|---|---|---|---|---|
| | Dental caries | Periodontal | Other | Total |
| Illiterate | 40 (39.2) | 57 (55.9) | 5 (4.9) | 102 (100.0) |
| Secondary and below | 33 (38.8) | 42 (49.4) | 10 (11.8) | 85 (100.0) |
| Higher secondary | 22 (48.9) | 13 (28.9) | 10 (22.2) | 45 (100.0) |
| University graduate | 20 (40.0) | 16 (32.0) | 14 (28.0) | 50 (100.0) |
| Total | 129 (45.7) | 110 (39.0) | 43 (15.3) | 282 (100.0) |

p=0.1049 (insignificant). Chi-square test was used to find 'p' value.

## DISCUSSION

The results of this study show that dental caries and its sequele is the principal reason for extraction of teeth followed by periodontal disease. Nearly half of the teeth were extracted due to dental caries and its sequele whereas more than one third teeth extracted due to periodontal disease. Dental caries is one of the most common causes for tooth loss in both the developing and the developed countries. This finding is consistent with findings from other studies where dental caries is the main reason for tooth loss over all followed by periodontal disease. Most patients burdened with poverty sought relief of pain by extraction of teeth which is cheaper in comparison to restorative care. Availability, affordability to oral health care services, perceived need, dietary factors, oral hygiene measures are some of the associated factors of dental caries. Although patients visiting PDCH had access to oral health care services; socioeconomic factors, dental visit pattern as reported by this study could be reasons for extracting teeth affected by dental caries and its sequele than opting for restorative treatment. Distribution by age group and dental diseases was highly significant. 90.0% of the subjects in age groups 30 years and below had teeth extracted due to dental caries and 55.6% of the subjects who were more than 30 years of age reported to have teeth extracted due to periodontal diseases. This is consistent to a study conducted in Scotland where the proportion of extractions attributed to periodontal disease increased from age 31–60years.[12] The loss of teeth due to periodontal disease and dental caries is associated with age, low socioeconomic status and literacy rate as reported by this study. Prevalence of periodontal diseases is associated with increasing age and is common in age groups above 30-40 years. Distribution of type of teeth extracted and dental disease was highly significant. Out of the extracted teeth, first permanent molar, 66.1% followed by second molar, (59.6%) was extracted due to dental caries and its sequel. First molars are the first permanent teeth to erupt in the oral cavity and is at high risk of dental caries

**Table-7:** Distribution by education level and visit to dentist

| Education level | Visit to dentist | | |
|---|---|---|---|
| | Very rare and never | Only due to pain | Total |
| Illiterate | 7 (6.9) | 95 (93.1) | 102 (100.0) |
| Secondary and below | 14 (16.5) | 71 (83.5) | 85 (100.0) |
| Higher secondary | 6 (13.3) | 39 (86.7) | 45 (100.0) |
| University graduate | 12 (24.0) | 38 (76.0) | 50 (100.0) |
| Total | 39 (13.8) | 243 (86.2) | 282 (100.0) |

p=0.02927 ($p < 0.05$ significant). Chi-square test was used to find 'p' value.

in the absence of appropriate preventive measures. Overall, caries and its sequele was the most frequent reason for tooth extraction, followed by periodontal disease, surgical indications, orthodontic and prosthetic reasons as reported by this study. Dental caries may have declined in the developed world due to water fluoridation as a whole population strategy; it is a challenge for developing countries. Although it was observed for patients with less than secondary school education to have more dental caries and periodontal disease; distribution by education level and dental diseases was insignificant. However distribution by education level and visit to dentist was significant. The results of the study in terms of low educational level and low dental visit or dental visit only in pain and caries being the foremost reason for extraction of teeth is consistent with national level studies conducted in different countries.[13-14]

Information on the reasons for tooth extraction is useful in knowing the prevalence of dental diseases and associated factors like dental visits, socioeconomic status.

A common risk factor approach, effective public health measures like salt fluoridation, integration of oral health education component in community level such as Mother and Child Health (MCH) program and through WHO Health Promoting schools should be considered for reduction of dental caries in low income nations. In Nepal fluoridation of water is not feasible; the reasons being rugged topography and the need for well established centralized piped water distribution systems. Milk fluoridation and school water fluoridation is also not feasible in Nepal. Salt fluoridation therefore could be an effective means of preventing dental caries in Nepal. It was reported that using amalgam fillings to restore the teeth of child population between 6 to 18 years would cost between US$ 1618 to US$3513 for 1000 children.[15] With the urbanization and change in dietary habits, dental caries is becoming more prevalent in Nepal.

Dental caries and periodontal disease prevention is important from early ages of life. Preventive measures could be highly effective in reducing loss of teeth due to dental caries and periodontal disease. The financial burden of people in low income nation like Nepal will not be able to meet the curative approach of restoring decayed teeth and treating periodontal diseases and replacing missing teeth with prosthesis.

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