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# Prevalence of Tooth Loss & its Prevailing Causes: A Cross Sectional Study

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**Abstract:**

- ***Aim:***
  **The aim of the survey was to investigate reasons for tooth loss.**

- ***Materials and Methods:***
  **The study was carried out among the patients visiting Dental main OPD (Outpatient department). A Special questionnaire proforma was designed mainly based on reasons for tooth loss especially due to dental caries, periodontal disease & other related etiological factors. The survey form was filled and at the end of the study data was subjected to statistical analysis.**

- ***Results:***
  **A total of 2104 teeth were loss for several reasons. The study found that 52.1 % tooth loss was due to dental caries in case of 31-40years age groups, which is more when compared to tooth loss due to periodontal diseases in this age group. i.e 42.6 % and tooth loss due to other reason was 7.01%.**

- ***Conclusion:***
  **It was concluded that, caries is the dominant reason for tooth loss in patients with 31-40 years of age while periodontal disease accounts second most common reason for tooth loss in the same age group.**

***Keywords:*** *Tooth Loss, Caries, Periodontal Diseases, Trauma.*

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## I. INTRODUCTION

A tooth is much more to be prized than a diamond." ― Miguel de Cervantes Saavedra, Don Quixote.

Dental plaque deposit on teeth is a concern for both cosmetic and its pathogenic nature. Presence of plaque is responsible for dental caries, gingivitis, periodontal problems, and halitosis. Loss of tooth/teeth affects overall health & quality of life, According to World health organization, a key aspect of oral health is the lifelong maintenance of functional & esthetic dentition. [1, 2]

The ancient Indian civilizations were reported to used traditional & mostly unscientific tooth cleaning methods to clean teeth, oral hygiene aids & awareness regarding oral health were limited, therefore percentage of dental caries & overall dental problems were more but now in 21st century the Indian population rural/urban in both, the awareness regarding oral hygiene aids, toothbrush, toothpaste & other

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herbal dentifrices, Advanced electronic toothbrushes has increased over the years & hence it is assumed that the percentage of dental caries, overall dental problems & ultimately tooth loss is reduced.

In developed countries the prevalence of tooth loss has constantly decreased but incongruity still exist in developing countries. [3, 4]

Tooth loss still remains to be a major worldwide health problem and has variable prevalence and distribution at national, regional and local levels. There are several reasons for which tooth loss occurs which includes dental caries, periodontal diseases, orthodontic treatments, traumatic injuries, prosthetic indications, tooth impaction, poor general health (mental, physical disability, depression), aging, neglect of oral hygiene other factors associated with tooth loss are age, gender, socio-behavioural factors, oral health behaviours, availability and quality of dental service. Non Communicable systemic diseases such as cardiovascular disease, stroke, diabetes, metabolic syndrome, dementia & depression share common risk factors as dental conditions.[5]

Cahen et al. (1985) reported that dental caries to be the main reason for tooth loss, [6] whereas another study reported that periodontal disease was the main reason, [7] while others found that dental caries and periodontal disease were equally responsible.[8] It was generally believed that dental caries was the main cause of tooth loss in the young, whereas periodontal diseases turned out to be more prominent after 40 years of age,[9] whereas socioeconomic and cultural aspects may also be related with attitude to seek dental care.[10]

Populations with poorer socioeconomic conditions have shown higher prevalence and extent of tooth mortality, which increases with aging. [11, 12]

Health workers, health centre are spreading awareness, but still the percentage of dental problems especially dental caries, periodontal diseases were same. So, to find out reasons for tooth loss this study was conducted.

## II. MATERIAL & METHODS

In the present study, inclusion of human Subjects was in compliance with Helsinki Declaration 1975, as revised in 2000. Institutional Ethical committee approval (CSMSS/DCH/EC/SS/2022-02) for study design & consent from all enrolled patient was taken. This was a cross-sectional study, examining the reason for tooth loss & was carried out in the main Dental OPD.

Subjects were enrolled, those having history of tooth loss. For this survey special designed questionnaire was prepared, which included subjects with 06+ age, both gender, and reason for tooth loss that included the periodontal problems, dental caries, accidental trauma, orthodontic purpose, method of tooth brushing, frequency of brushing & use of interdental aids were also included to find out other reasons.

## III. RESULTS

A total of 2070 subjects those having previous history of tooth loss were enrolled. The distribution of subjects were according to gender Female :663 32%, Male:1407 i.e 68%, age, tooth brushing habits, educational status of subjects, area of subject (rural & urban) & adverse habits as shown in (Table 1). Distribution of subjects as per reason of tooth loss, reasons for tooth loss according to gender, age, area shown in (Table 2). Tooth loss distribution in maxillary & mandibular arch as shown in (graph 1,2 & 3).

The present study showed 68% males & 32% females were affected with tooth loss. It was observed that 521 subjects were in age group between 31-40 years,446 subjects in 41-50 yrs, 409 subjects in 21-30 years, 335 subjects in 51-60 yrs, 209 subjects in 61-70 yrs, 81 subjects in 11-20 yrs, 64 subjects in > 70 yrs, 5 subjects in less than 10 yrs were affected as shown in (Table 1).

Considering residential & educational status total 70% of the subjects enrolled in the present study were from urban population and rest 30% of them were from rural area. Total 1300 secondary educational class subjects were affected by tooth loss which was more than other class as shown in (Table 1).

It was also observed that amongst 2070 subjects, all were using toothbrush for teeth cleaning but, only 1 % of them brush their teeth twice a day, rest 99% brush once a day as shown in (Table 1). None of them was aware of scientific brushing techniques & only 1 subject was using dental floss.

In the present survey, it was observed that 170(8.2%) subjects had adverse habit of tobacco chewing, 73(3.52%) subjects had habit of smoking, 43(2.07%) subjects with habit of ghutka chewing, & 32 (1.54%) with betelnut chewing shown in (Table 1)

As per the aim of present study, it was found that reasons for tooth loss predominantly were dental caries (52.1%) followed by periodontal disease (42.6%) shown in (Graph 1). Among 52.1% subjects 690 male & 388 females were affected with dental caries, & among 42.6% subjects 660 males & 221 females were affected with periodontal reasons.7.01% tooth loss were other reasons like accidental trauma & orthodontic purpose (113 males & 32 females) shown in (Table 2).

Total 302 subjects with maximum tooth loss because of dental caries were observed in age group of 31-40 years, 247 subjects in 21-30 yrs, 207 subjects in 41-50 yrs 159 subjects in 51-60 yrs, 94 subjects in 61-70 yrs, 30 subjects in 11-20 yrs, 37 subjects were more than 70 yrs,2 subjects were less than 10 yrs as shown in (Table 2).

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Second reason for tooth loss was periodontal diseases which were observed in 239 subjects in age group of 31-40 years, 217 subjects in 21-30 yrs, 189 subjects in 41-50 yrs, 109 subjects in 51-60 yrs, 68 subjects in 61-70 yrs, 34 subjects in 11-20 yrs, 22 subjects in more than 70 yrs, 3 subjects in less than 10 yrs & only 7.01% tooth loss was due to other reasons shown in (Table 2).

Among 52.1% of dental caries affected tooth loss subjects, 302 were from rural area, 776 were from urban area. Similarly, among 42.6% subjects who lost tooth because of periodontal diseases, 268 were from rural areas & 614 were from urban area. Remaining 7.01% subjects were from other reason group amongst them 37 subjects were from rural areas & 108 from urban area as shown in (Table 2).

The maximum number of tooth loss i.e 52.1% was because of dental caries and it was observed that in molars, mandibular left first molar was more frequently affected i.e 246 in number, tooth least affected was lower right third molar i.e 27 in number shown in (graph 1). In premolars mandibular right second premolar was most affected i.e 65 in number, least affected was maxillary right first premolar i.e 8 in number shown in (graph 2). Similarly in anterior teeth maxillary right central incisor was most affected i.e 17 in number & least affected was mandibular left canine i.e 4 in number shown in (graph 3).

Periodontal disease was the second reason for tooth loss (42.6%). In molars it was observed that mandibular left first molar was most affected i.e 109 in number, least affected tooth was mandibular right third molar i.e 11 in number shown in (graph 1). In premolars the tooth most affected was maxillary right second premolar i.e 63 in number, least affected was mandibular left first premolar i.e 30 in number shown in (graph 2). Similarly in anterior teeth maxillary right central incisor was most frequently affected i.e 100 in number & least affected was maxillary left canine i.e 20 in number (graph 3).

## IV. DISCUSSION

Tooth loss is a worldwide public health issue, especially in low and middle-income countries.

Tooth loss impacts negatively on the quality of life affecting our daily activities like chewing, swallowing, speech, esthetics, Phonetics and overall wellbeing. According to Marcenes et al.2013 and colleagues, severe teeth loss is ranked in the 36th position among the 100 chronic diseases that affect life expectation, reflecting the importance of this condition considering not only oral, but also the systemic health. [13] Immunological and genetic reasons are some of the contributory factors that may explain why some population exposed to the same bacterial etiologic factors did not develop similar pathological conditions. [14, 15]

In the present study it was observed that even after using a toothbrush, there is history of tooth loss in 2070 subjects, either due to caries or due to periodontal disease. So, looking at this current scenario use of interdental aids & scientific application of different brushing techniques should be implemented at school levels as well as by conducting community based oral health awareness camps.

The present study showed 68% males & 32 % females were affected with tooth loss (Table 1). Comparing tooth loss in male versus female, the number of tooth loss was more in male as compared to female similar results were found by Cahen et al., (1985)[6] & Barbato et al., (2007).[16] In contrast Kalyanpur et al., (2011) observed more tooth loss in females compared to males.[17]

In the present survey, the percentage of tooth/teeth extraction was more in male this may be because of adverse habits such as tobacco chewing, smoking, gutka chewing, betelnut chewing & other deleterious habits which ultimately affects the good oral hygiene maintenance & also considered as a potential risk indicator for periodontal disease.

Total 70% of the subjects which participated in present study were from urban area and rest 30% of them were from rural area shown in (Table 1). Maximum number of subjects i.e (1300) which were affected with tooth loss, were from secondary educational class shown in (Table 1). This could be due to the lack of awareness, negligence towards hygiene, poor socioeconomic status, low level of education & less affordability for treatment. Which is in agreement of the previous study by Manski et al., (1998)[18] who stated that demographic data such as race, socioeconomic conditions are the predictors of dental care utilization.

In the present study maximum number of tooth loss was i.e 52.1% because of dental caries most affected tooth in molars was mandibular left first molar shown in (graph 1). Premolar most affected was mandibular right second premolar shown in (graph 2). In the anterior teeth region tooth which was most affected was mandibular right central incisor shown in (graph 3).

Out of the 42.6% subjects with tooth loss because of periodontal disease in molars tooth most affected was mandibular left first molar shown in (graph 1). In premolars tooth most affected was maxillary right second premolar shown in (graph 2). In anterior region most affected tooth was mandibular left central incisor shown in (graph 3).

Similarly, Broadbent JM[19] & Batchelor PA et al.,[20] conducted study at Sri Sankara dental college Trivandrum, India, the teeth extracted were in descending order first premolar(Orthodontic reasons) > Molars(Dental caries) >Anterior teeth (Periodontal disease)Mandibular anterior > Maxillary anterior )

The results of this study indicates that dental caries and periodontal disease are the main reasons for tooth loss, which was similar to a previous studies done by Al-Shammari KF[9] that, caries was the dominant reason for extraction in patients with 20–30 years age group, while

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periodontal diseases accounts for the majority of tooth extraction in patients older than 40 years of age. Whereas McCaul LK et al., (2001)[21] reported that dental caries and its sequel remain the most important cause of tooth loss throughout adult life in Scotland.

As per meta-analysis conducted by Malinga Venkat et al.[22] also reported that most common irreversible dental disease are dental caries &periodontal diseases, both conditions are dominant reason for tooth loss. Similar results were observed in the present study it may be because of lack of knowledge about scientific brushing technique & lack of use of interdental aids.

The gingival interdental col is non-keratinized. The dental plaque present interdentally in col area remains untouched irrespective of any type of toothbrush & brushing techniques. This might be the reason, the disease process begins most frequently from the interdental areas, which if untreated will ultimately lead to tooth loss. Dental plaque is not only responsible for oral but also systemic diseases & conditions like cardiovascular, respiratory, stroke & risk for preterm low birth weight infant.[23]

So, looking at the current scenario more emphasis should be given on use of interdental aids & motivation regarding use of scientific brushing techniques should be implemented. The use of interdental aids along with scientific brushing technique will not only reduce tooth loss in future, but may also reduce the risk of systemic diseases.

## V. CONCLUSION

Inspite of increased awareness regarding toothbrush in urban & rural areas, the prevalence of tooth loss remains same as it was in the past decades. In the present study it was observed that dental caries in 31-40 years of age group followed by periodontal diseases are the most common reasons for tooth loss. There is need to increase awareness regarding plaque control, by demonstrating use of different brushing techniques such as modified bass technique with its importance & proper use of interdental aids to improve the oral hygiene. Measures at the different community level should be implemented to prevent tooth loss in near future.

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- Ethical Approval: Obtained


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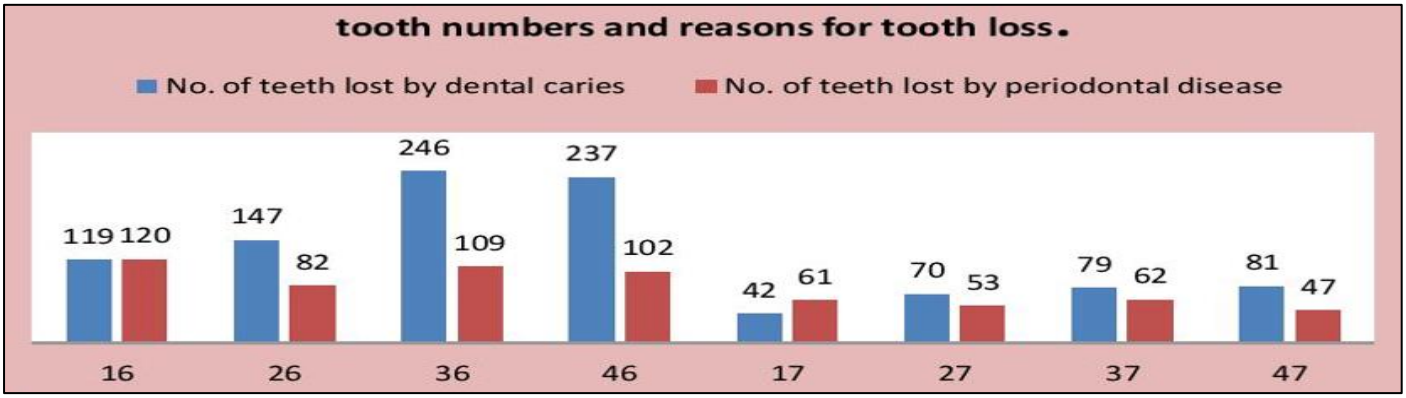

Fig 1 Tooth Number and Reasons for Tooth Loss

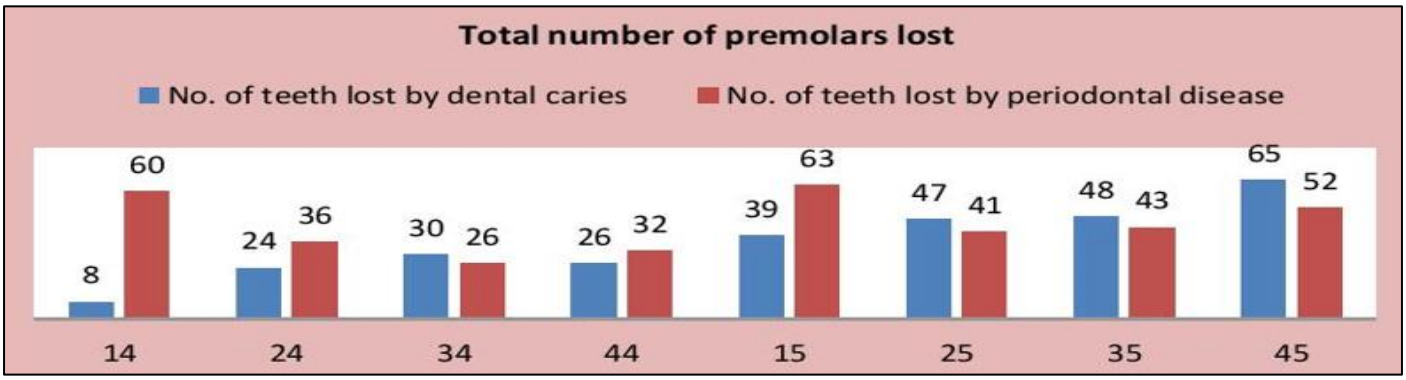

Fig 2 Total Number of Premolars Lost

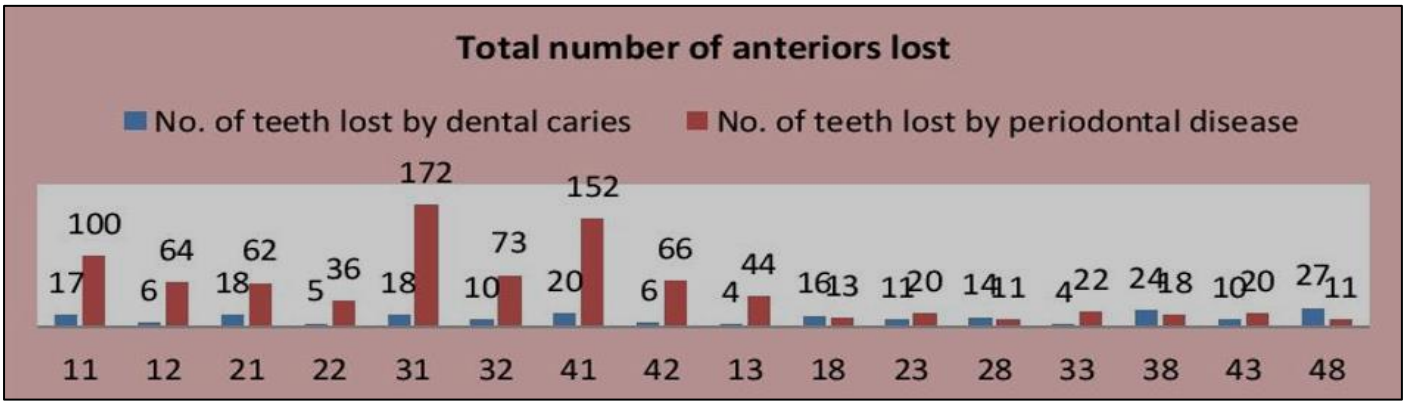

Fig 3 Total Number of Anteriors Lost

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Table 1 Demographic Profile of Participants

| Perticular | | No. of participants | Percenatge |
|---|---|---|---|
| Gender | Male | 1407 | 67.6 |
| | Female | 663 | 32.4 |
| Age-Groups | ≤10 years | 05 | 0.24 |
| | 11-20 | 81 | 3.91 |
| | 21-30 | 409 | 19.8 |
| | 31-40 | 521 | 25.17 |
| | 41-50 | 446 | 21.54 |
| | 51-60 | 335 | 16.18 |
| | 61-70 | 209 | 10.09 |
| | >70 | 64 | 3.09 |
| | Mean±SD | 42.79±14.74 years | |
| **Tooth Brushing** | once a day | 2052 | 99.13 |
| | Twice a Day | 18 | 0.87 |
| **Interdental aids** | Yes | 00 | 00 |
| | NO | 2061 | 100.0 |
| **Education** | Illiterate | 236 | 11.40 |
| | Primary | 175 | 8.45 |
| | Secondary | 1300 | 62.80 |
| | Higher Secondary | 319 | 15.41 |
| | Diploma | 10 | 0.48 |
| | Graduate | 27 | 1.30 |
| | Post-Graduate | 03 | 0.14 |
| **Area** | Rural | 614 | 29.7 |
| | Urban | 1456 | 70.3 |
| **Habits** | Smoking | 73 | 3.53 |
| | Tobacco | 170 | 8.21 |
| | Betelnut | 32 | 1.54 |
| | Ghutka | 43 | 2.08 |

Table 2 Distribution of Patients According to Sex, Age, Area and Reason for Tooth Loss

| | | | Partially dentate, tooth loss by caries only | Partially dentate, tooth loss by periodontal disease only | Other |
|---|---|---|---|---|---|
| **Gender** | **Male** | 1407 | **690** | **660** | **113** |
| | **Female** | 663 | **388** | **221** | **32** |
| **Age-Groups** | **≤10 years** | **05** | **02** | **03** | **02** |
| | **11-20** | **81** | **30** | **34** | **11** |
| | **21-30** | **409** | **247** | **217** | **32** |
| | **31-40** | **521** | **302** | **239** | **52** |
| | **41-50** | **446** | **207** | **189** | **20** |
| | **51-60** | **335** | **159** | **109** | **12** |
| | **61-70** | **209** | **94** | **68** | **12** |
| | **>70** | **64** | **37** | **22** | **04** |
| **Area** | Rural | 614 | **302** | **268** | **37** |
| | Urban | 1456 | **776** | **614** | **108** |