ISSN: 0976-3031

*Available Online at http://www.recentscientific.com*

**CODEN: IJRSFP (USA)**

*International Journal of Recent Scientific Research*
*Vol. 8, Issue, 9, pp. 19917-19922, September, 2017*

**International Journal of Recent Scientific Research**

**DOI: 10.24327/IJRSR**

**Research Article**

# INCIDENCE, AETIOLOGY AND CONSEQUENCES OF TOOTH LOSS IN ADULT POPULATION: AN AREA BASED CROSS-SECTIONAL STUDY

**Devika Chakravarty*., Sangeeta Muglikar., Rashmi Hegde., Sana IQBAL and Saba Lambe**

Department of Periodontology and Oral Implantology, M.A. Rangoonwala College of Dental Science and Research Centre, Pune, Maharasht

**DOI: http://dx.doi.org/10.24327/ijrsr.2017.0809.0787**

**ARTICLE INFO**

***Article History:***

Received 17th June, 2017
Received in revised form 21th July, 2017
Accepted 28th August, 2017
Published online 28th September, 2017

***Key Words:***

Tooth loss, caries, Edentulism, Periodontitis and Age

**ABSTRACT**

**Background:-**Tooth loss has detrimental effects on masticatory ability, aesthetics and nutritional status. People with tooth loss experienced more social and psychological impact on their quality of life. Potential risk factors may be older age, gender, caries, attachment loss, periodontal disease, trauma, cigarette smoking etc.

**Aims and Objectives:-**To investigate the incidence, aetiology and consequences of tooth loss in adult population of pune city.

**Material and Methods:-**300 subjects visiting the dental OPD of two centres were included in the study. A Questionnaire including variables such as gender, age, dental history, medical history, aetiology of tooth loss and willingness for prosthetic rehabilitation was asked.

**Results:-**The statistical analysis showed significant association between age and tooth loss (0.0001). Dental caries was seen as the major etiological factor in maximum number of cases (55.3%) followed by periodontitis (41%) and trauma (6%). Females (n=168) were more prone to tooth loss compared to males (n=132). In this study, 42.33% of individuals had difficulty in mastication which was the most frequently observed consequence following tooth loss. Overwhelming response was observed in 96% of the patients for prosthetic rehabilitation.

**Conclusion:** In this study, higher number of missing teeth was reported in people with low socioeconomic status and poor educational background. Oral health awareness and education programs should be conducted at the community level for every individual. Efforts to preserve more natural teeth of the ageing population should focus on the prevention and treatment of caries and periodontal diseases. The need to replace missing teeth should be carefully explained to the patient.



## INTRODUCTION

Tooth loss is known to have an integral role in the loss of masticatory ability, aesthetics and nutritional status of an individual. Worldwide, the prevalence of edentulism is high and depends on many factors (Heath RM 1992 Khazaei S 2013, Nassani MZ 2009). Weintraub and Burt used the term edentulism to describe the complete absence of natural teeth, regardless of whether they had been replaced or not.It has been shown that it considerably affects the oral function and quality of life (Johnson GK 2001).

Slade and Spencer reported that compared to dentate people, edentulous ones experienced more social and psychological impacts on their quality of life including feeling self-conscious and avoiding social interactions. Also, they have been reported to experience more pain and discomfort (Slade GD; Spencer AJ 1994).

A higher proportion of edentulous individuals and a lower number of remaining teeth in dentulous subjects have been found in low socio economic classes and in groups with poor educational background (Ahlqwist *et al*, 1991). Burt *et al*. evaluated risk factors of tooth loss over a period of 28 years and found that the effect of social behavioural risk factors was more evident in the complete edentulous individuals compared to the group with partial edentulism (Burt *et al*, 1990). Low income has also been suggested to be a risk factor for edentulism (Dolan TA *et al* 2001; McGrath *et al* 2002).

Caries experience, attachment loss, periodontal diseases, trauma and cigarette smoking, gender, marital status and oral hygiene practices are other major risk indicators of tooth loss

**Corresponding author:* **Devika Chakravarty**
Department of Periodontology and Oral Implantology, M.A. Rangoonwala College of Dental Science and Research Centre, Pune, Maharasht

(Holm G 1994; Thomas-Weintraub A 1985). In addition, patterns of tooth loss vary by gender and population (Berkey DB *et al* 1996; Holm G 1994; Muller F *et al* 2007). There are various factors which are recognized to be associated with oral health of the adult population, such as literacy level, smoking or smokeless and alcohol consumption.

Other factors influencing oral health in the adult population are oral hygiene practices, perceptions regarding oral health, function of the dentists, social and cultural beliefs and attitudes etc.

During National Survey of Oral Health in US Employed adults and Seniors in 1985-86, only 4.2 percent of employed adults under age 65 were edentulous, though the corresponding proportion for those aged 65 and older was 41.1 percent (Miller AJ *et al* 1987). According to the World Health Organization (WHO), adults should have a minimum of 21 functional teeth to provide the ability to experience a good dietary intake without the need for dentures (Xie Q 1999). The percentage of edentulous people is expected to decrease in the coming years as a result of improved oral health where it will increase as a result of the strong increase in the aging population (Khazaei S *et al* 2013;Mack F *et al* 2008; Thompson GW *et al* 1998;Weintraub JA *et al* 1985). The Adult Dental Health Survey 1981 has shown not only a large decrease in the number of edentulous people over the last 30 years, but also shows that most patients will remain partially dentate for life. Patients' attitudes towards losing even small numbers of teeth are also changing and the same survey shows that patients are willing to undergo extensive treatment in order to save their teeth (Steele J *et al* 2000).

The purpose of the present study was to investigate the incidence, aetiology and consequences of tooth loss in adult population of Pune city.

## MATERIALS AND METHODS

### *Study Design and Population*

Study was a cross sectional observational study, where all adult patients aged between 18-60yrs visiting dental Out-patient department of two centres of Pune city(M.A. Rangoonwala College of Dental Sciences and Research Centre and Kamla Nehru Hospital) were screened for tooth loss. The study was approved by the ethical committee of the M.A.Rangoonwala College of Dental Sciences and Research centre, Pune.

A total of 300 systemically healthy patients were included in the study and duration of the study was 4 months. The examination was conducted using basic diagnostic tools like mouth mirror, periodontal probe, and explorer. Demographic information like name, age, gender and personal details like habits and oral hygiene practice of the individuals were recorded in a data collection sheet. A detailed Medical, Dental and family history was recorded for each individual. A Questionnaire comprising of variables of edentulousness such as number, aetiology of consequences of missing teeth and willingness for prosthetic rehabilitation was developed to acquire required data from the subjects and the information were filled personally by the operator.

### *Statistical Analysis*

For statistical analysis SPSS20 software was used. ANOVA test was used to find the significance of regression. To investigate the relationship between qualitative Risk factors and levels of tooth loss, chi-square test were used as a univariate method. P value<0.05 was considered as significant.

## RESULTS

Basis statistics for age and number of teeth lost is presented in Table:1. Mean age of the patients is 44.83 years with a standard deviation of 12.84years.The age varied from a minimum of 16 years to a maximum of 79 years. With respect to tooth loss, Mean tooth loss is 2.84 with a standard deviation of 2.17. The number of tooth lost varies from a minimum of 1 to maximum of 17.

**Table 1** Descriptive Statistics

| Variable | N | Minimum | Maximum | Mean | Std. Error | Std. Dev |
|---|---|---|---|---|---|---|
| Age | 300 | 16.00 | 79.00 | 44.8333 | .74144 | 12.84219 |
| Tooth Loss(N) | 300 | 1.00 | 17.00 | 2.8367 | .12533 | 2.17080 |

**Figure1**

***Questionnaire***

**Name:**

**Age:**

**Gender:** Male Female

**Habits:** Smoking YES NO
Tobacco/Pan Chewing YES NO

**Medical history:**

**Dental history:**

**Oral hygiene practice:**

**Missing teeth:**

| | |
|---|---|
| 8 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 8 |
| 8 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 8 |

**Cause of Edentulousness**

A.Dental Caries:
B.Periodontal Disease:
C.Trauma:

**Willingness for Prosthetic Rehabilitation**: YES NO

**Consequences of Tooth Loss:**
A.Drifting of Adjacent Teeth: YES NO
B.Decreased Vertical Dimension: YES NO
C.Difficulty In Mastication: YES NO
D.Supraeruption: YES NO

We have also found the correlation between age and tooth loss and fitted regression line of tooth loss versus age. The results of analysis are presented in Table: 2.

**Table 2** Pearson Correlation and Regression Equation

| Variables | r-Value | P-Value | Regression Equation | F | P-Value |
|---|---|---|---|---|---|
| Age, Tooth Loss(N) | 0.595 | 0.0001 | Tooth Loss(N) = - 1.67 + 0.101 Age | 163.546 | 0.0001 |

The correlation between age and tooth loss (0.595) is highly significant (p=0.0001), as expected. The regression is also found to be significant. The rate of increase in the tooth loss is equal to 0.102 per year of age. Significance of regression was evaluated by ANOVA Test and is highly significant (F=163.54, p=0.0001).The graph of regression equation is present in Figure:2,

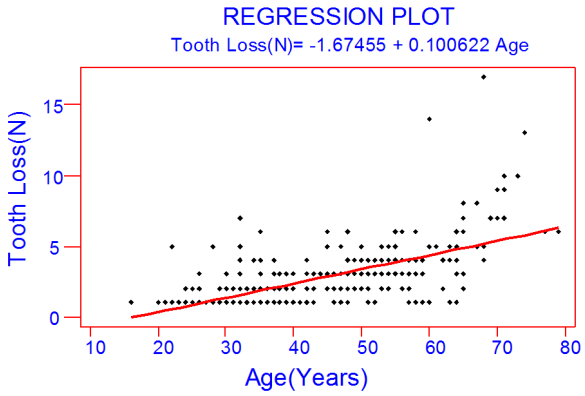


**Figure 2** Graph of Regression Line (Age Vs Tooth Loss)

We have also analysed if there are significant differences in mean age of patients in different aetiology groups. An ANOVA Test was carried out for this purpose. The results of ANOVA Test is presented as Table: 3, along with mean age and standard deviation for different aetiology classes.

**Table 3** Mean, Standard Deviation and Anova Results: Age Vs Etiology

| Etiology | N | Mean Age | St Dev | F P-Value |
|---|---|---|---|---|
| Caries | 160 | 40.44 | 10.68 | 47.81 | 0.0001 |
| Caries + Periodontitis | 6 | 61.50 | 12.13 | | |
| Periodontitis | 117 | 52.39 | 0.52 | | |
| Trauma | 17 | 28.29 | 9.76 | | |

From the Table: 3, we find the least mean age for Trauma (28.29 years) followed by in increasing order; Caries (40.44 years), Periodontitis (52.39 years) and Caries+Periodontitis (61.50 years). Differences among the mean age are statistically highly significant (F=47.81, p=0.0001). Distribution of age in different aetiology are presented by Box plots in Figure: 3,

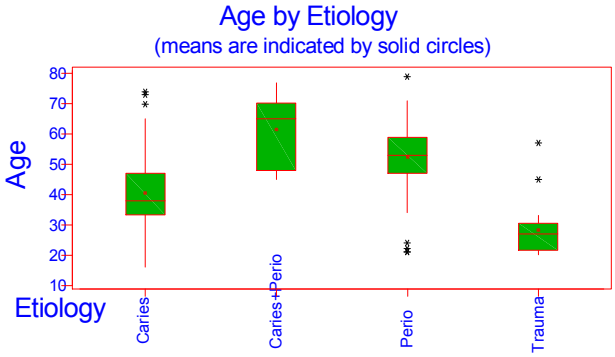


**Figure3** Box Plots

We also present number of cases and percent occurrence for each aetiology separately reflected in Table: 4, Trauma was observed in minimum number of cases n=18(6%), periodontitis n=123(41%) and Caries was observed in maximum number of cases n=166(55.3%). The Distribution of cases for etiology is also presented by a bar Graph (Figure-4) appended,

**Table 4** Occurrence of Etiology

| Etiology | N | Percent |
|---|---|---|
| Caries | 166 | 55.3 |
| Periodontitis | 123 | 41 |
| Trauma | 18 | 6 |

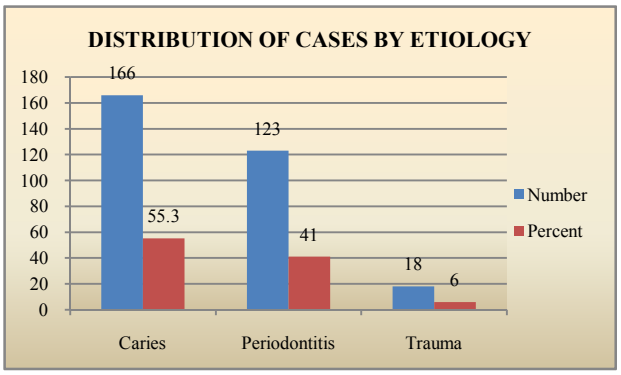


**Figure 4** Distribution of Cases By Etiology

Table:5 presents the number, percent as well as prevalence rate for different consequences in relation to total subjects having one or the other etiology, Posterior bite collapse was observed in minimum number of cases n=30(10%) with a prevalence rate of 100/1000. Next higher prevalence rate with respect to No abnormality detected (207/1000) increasingly followed by drifting (320/1000), Supraeruption (353/1000) and difficulty in mastication (423/1000) (Table:5) Distribution of consequences is also depicted by a bar Graph (Figure-5).

**Table 5** Occurrence of Consequences

| Consequences | N | Percent | LEGENDS | Prevalence Rate |
|---|---|---|---|---|
| DIM | 127 | 42.33 | DIM = Difficulty In Mastication | 423.3/1000 |
| DRIFTING | 96 | 32 | | 320/1000 |
| PBC | 30 | 10 | PBC = Posterior Bite Collapse | 100/1000 |
| SE | 106 | 35.32 | SE = Supraeruption | 353.2/1000 |
| NAD | 62 | 20.67 | NAD – Nothing Abnormal Detected | 206.7/1000 |

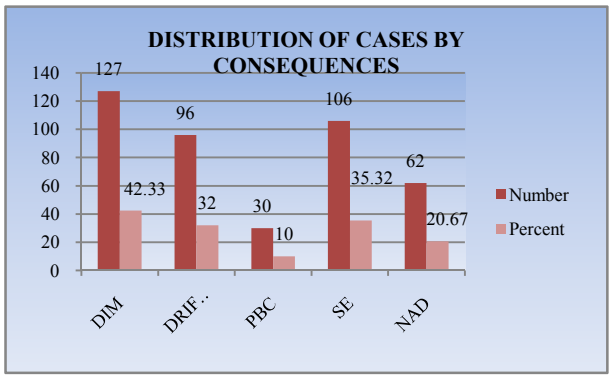


**Figure 5** Distribution of Cases By Consequences

**NOTE-1: For both Tables occurrences are out of 300 cases. NOTE-2: Total % > 100 as there are cases with multiple Etiologies/Consequences**

Association between different pair of factors is done by using Chi-square test (Table:6) From the table, we see that association of sex with etiology, consequence as well as prosthetic rehabilitation are not significant. The related values are (Chi-square=0.881,p=0.830),(Chi-square=13.316,p=0.307) and (Chi-square=1.042,p=0.307). However the association between consequences and etiology is statistically very highly

significant (Chi-square=109.37,p=0) respectively. Thus, the association between etiology and consequences is very strong as expected.

**Table 6** Results for Association

| FACTORS | DF | Chi-Square Value | P-Value |
|---|---|---|---|
| Sex x Etiology | 3 | 0.881 | 0.830 |
| Sex x Consequence | 13 | 13.316 | 0.307 |
| Sex x Prosthatic Rehabilitation | 1 | 1.042 | 0.307 |
| Consequence x Etiology | 36 | 109.37 | 0 |

## DISCUSSION

The preservation of dentition can be justified on the following grounds that, teeth are useful for maintenance of arch length, esthetics, maintenance of healthy oral environment, mastication, phonetics etc (Basnvat SK *et al* 2015). Dental status is multidimensional, and several studies have investigated the risk indicators of missing teeth in different parts of the world (Reddy PS *et al* 2014). Indicators of tooth loss reflect oral impairment and indicators of tooth retention reflect oral health and well-being and dental status is related to a number of social and socioeconomic factors (Barbato PR *et al* 2007). A higher proportion of edentulous individuals and a lower number of remaining teeth in dentulous subjects have been found in low socio economic classes and in groups with poor educational back ground (Xie Q *et al* 1999). Older people exhibit higher number of missing teeth than younger individuals, reflecting the fact that age is the most important reported factor associated with missing teeth.

Caries variables and periodontal disease variables seem to be important predictors of occurrence of tooth loss, but at the tooth level, caries would seem to be predominant cause of tooth loss in all age group (Eklund SA, Burt BA 1994). Other reported factors associated with missing teeth include education, income, oral hygiene practices, marital status, gender and smoking (Ahlqwist M *et al* 1989).

The importance of this study is to establish base line data on the prevalence of edentulism in adult population seeking care. Shah N *et al*. showed that tooth loss increased with advancing age and was higher among the elderly subjects (Shah N *et al* 2004). Numerous studies have shown that tooth loss and edentulism are significantly highly associated with aging, which is similar to the results of present study that also corroborates the finding showing that older individuals were more susceptible to tooth loss. The correlation between age and tooth loss (0.595) was highly significant (p=0.0001) as expected.

In this study, the number of male subjects were 132 and the number of female subjects were 168. It was seen from the similar study by Prabhu *et al*. that the number of partially edentulous females outnumbered the males (Prabhu N *et al* 2009). This is in accordance with earlier studies, which have reported more females than males having partial edentulousness (Liss J *et al* 1982; Mersel A *et al* 1984; Oginni FO 2005; Osterberg T *et al* 1991). A higher proportion of males were dentulous compared to females (Basnvat SK *et al* 2015). This could be because most males were employed and had better access to treatment (Suominen-Taipale AL *et al* 1999). This is in agreement with the study by Udani *et al* (Udani TM1954). Some earlier studies have also shown significant gender difference in edentulism with more males becoming edentulous than females (Hoover JN; McDermott RE 1989).

In contrast to the above finding, present study showed that there is no significant statistical association between sex and edentulousness (p=0.464). This may be ascribed to the fact that our present study did not cover various socioeconomic and psychological factors

Another important finding was that dental caries (55.3%) topped the aetiology for tooth loss, followed by dental caries and periodontal disease (43%), periodontitis (41%) and trauma (6%). The result is in conformity to the previous studies by Cahen PM *et al*. (Cahen PM *et al* 1985). The fact that dental caries is the leading cause of tooth loss may be attributed to the changes in dietary patterns, a departure from coarse/tough and fibrous diet to more cariogenic refined carbohydrate-rich food, socioeconomic background and lifestyle of the people over the years (Prabhu N *et al* 2009). Periodontitis is one of the major risk factors for tooth loss (Renvert S *et al* 2013). The prevalence of periodontitis is increased by microbial tooth deposits, smoking, aging, genetic factors, systemic conditions etc. (S.Renvert *et al*)

According to this survey, posterior bite collapse was observed in least number of cases (10%).20.67% patients had no abnormality detected, 32% had drifting and 35.3% had supra eruption as a consequence of tooth loss. According to this study, 42.33% of individuals exhibited difficulty in mastication which was the most frequently observed consequence following tooth loss. This finding was similar to the previous studies done by Annette Thomas-Weintraub *et al*, who stated that masticatory difficulty was the most frequently voiced complaint (Thomas-Weintraub A 1985).

Overwhelming response was observed attributed to the willingness to accept prosthetic treatment by the patients (96%) who were involved in the study, which may be due to their increased responsiveness and awareness during dental examinations. This shows that majority of subjects were willing to accept prosthodontic treatment, if they are motivated which is in accordance to previous study by Henry A Collett *et al* (Collett HA 1967). The negative attitude among patients might be due to the influence of their lack of education, income and availability of dental treatment facilities (Basnyat SK 2015).

## CONCLUSION

In this cross-sectional observational study**,** higher number of missing teeth was reported in people with low socioeconomic status and poor educational background. There was a highly significant correlation between age and tooth loss which shows that tooth loss is directly proportional with ageing. Dental caries played an important role in edentulousness followed by periodontitis. Efforts to preserve more natural teeth of the ageing population should focus on the prevention and treatment of caries and periodontal diseases (Kida IA 2006).

Majority of the patients exhibited difficulty in chewing following tooth loss followed by other consequences like drifting of adjacent tooth, Supraeruption and posterior bite collapse. The importance of prosthetic rehabilitation should be

carefully explained to the patient. Due to shorter study period, smaller sample size could be assessed and there was no standardization of the age groups therefore further prospective research should include more number of sample size and age wise selection of groups so as to obtain more accurate and reliable result.

## References


1. Ahlqwist M, Bengtsson C, Gröndahl HG, Lapidus L. Social factors and tooth loss in a 12-year follow-up study of women in Gothenburg, Sweden. *Community dentistry and oral epidemiology*. 1991 Jun 1; 19(3):141-6.
2. Ahlqwist M, Bengtsson C, Hollender L, Lapidus L, Österberg T. Smoking habits and tooth loss in Swedish women. *Community dentistry and oral epidemiology*. 1989 Jun 1; 17(3):144-7.
3. Barbato PR, Nagano HC, Zanchet FN, Boing AF, Peres MA. Tooth loss and associated socioeconomic, demographic, and dental-care factors in Brazilian adults: an analysis of the Brazilian Oral Health Survey, 2002-2003. *Cadernos de saude publica*. 2007 Aug; 23(8):1803-14.
4. Basnyat SK, Sapkota B, Shrestha S. Epidemiological Survey on Edentulousness in Elderly Nepalese Population. *Kathmandu University Medical Journal*. 2015 Oct 19; 12(4):259-63.
5. Berkey DB, Berg RG, Ettinger RL, Mersel A, Mann J. The old-old dental patient: the challenge of clinical decision-making. *The Journal of the American Dental Association*. 1996 Mar 1;127(3):321329331-7332.(2 lines)
6. Burt BA, Ismail AI, Morrison EC, Beltran ED. Risk factors for tooth loss over a 28-year period. *Journal of Dental Research*. 1990 May; 69(5):1126-30.
7. Cahen PM, Frank RM, Turlot JC. A survey of the reasons for dental extractions in France. *Journal of dental research*. 1985 Aug; 64(8):1087-93.
8. Collett HA. Motivation: A factor in denture treatment. *The Journal of prosthetic dentistry*. 1967 Jan 1; 17(1):5-15.
9. Dolan TA, Gilbert GH, Duncan RP, Foerster U. Risk indicators of edentulism, partial tooth loss and prosthetic status among black and white middle-aged and older adults. *Community dentistry and oral epidemiology*. 2001 Oct 1; 29(5):329-40.
10. Eklund SA, Burt BA. Risk factors for total tooth loss in the United States; longitudinal analysis of national data. *Journal of public health dentistry*. 1994 Jan 1; 54(1):5-14.
11. Heath RM. The dental health of elderly people in Britain, 1968 to 1988. *International dental journal*. 1992 Oct; 42(5):399.
12. Holm G. Smoking as an additional risk for tooth loss. *Journal of periodontology*. 1994 Nov;65(11):996-1001.
13. Hoover JN, McDermott RE. Edentulousness in patients attending a university dental clinic. *Journal (Canadian Dental Association)*. 1989 Feb;55(2):139-40.
14. Johnson GK, Slach NA. Impact of tobacco use on periodontal status. *Journal of Dental Education*. 2001 Apr 1;65(4):313-21.
15. Kalk W, Van Rossum GM, Van Waas MA. Edentulism and preventive goals in the treatment of mutilated dentition. *International dental journal*. 1990 Oct; 40(5):267-74.
16. Khazaei S, H Keshteli A, Feizi A, Savabi O, Adibi P. Epidemiology and risk factors of tooth loss among Iranian adults: findings from a large community-based study. *BioMed research international*. 2013 Oct 21; 2013.
17. Kida IA, Åstrøm AN, Strand GV, Masalu JR. Clinical and socio-behavioral correlates of tooth loss: a study of older adults in Tanzania. BMC Oral Health. 2006 Mar 15; 6(1):5.
18. Liss J, Evenson P, Loewy S, Ayer WA. Changes in the prevalence of dental disease. Bureau of Economic and Behavioral Research, Council on Dental Health and Health Planning. *Journal of the American Dental Association* (1939). 1982 Jul; 105(1):75-9.
19. Mack F, Abeygunawardhana N, Mundt T, Schwahn C, Proff P, Spassov A, Kocher T, Biffar R. The factors associated with body mass index in adults from the study of health in Pomerania (SHIP-0), Germany. J *Physiol Pharmacol.* 2008 Nov 1; 59(Suppl 5):5-16.
20. Mersel A, Anaise JZ, Shem-Tov A. Prosthetic needs and demands for services of a group of elderly people in Israel. *Community dentistry and oral epidemiology*. 1984 Oct 1; 12(5):315-8.
21. McGrath C, Bedi R. Severe tooth loss among UK adults-who goes for oral rehabilitation?. *Journal of oral rehabilitation*. 2002 Mar 1; 29(3):240-4.
22. Miller AJ, Brunelle JA, Carlos JP, Brown LJ, Löe H. The national survey of oral health in US employed adults and seniors: 1985-1986. Oral health of United States adults.(NIH publication no. 87-2868). 1987 Aug.
23. Müller F, Naharro M, Carlsson GE. What are the prevalence and incidence of tooth loss in the adult and elderly population in Europe?. *Clinical oral implants research.* 2007 Jun 1; 18(s3):2-14.
24. Nassani MZ, Locker D, Elmesallati AA, Devlin H, Mohammadi TM, Hajizamani A, Kay EJ. Dental health state utility values associated with tooth loss in two contrasting cultures. *Journal of oral rehabilitation*. 2009 Aug 1; 36(8):601-9.
25. Oginni FO. Tooth loss in a sub-urban Nigerian population: causes and pattern of mortality revisited. *International dental journal*. 2005 Feb 1; 55(1):17-23.
26. Österberg T, Carlsson GE, Mellström D, Sundh W. Cohort comparisons of dental status in the adult Swedish population between 1975 and 1981. *Community dentistry and oral epidemiology*. 1991 Aug 1; 19(4):195-200.
27. Prabhu N, Kumar S, D'souza M, Hegde V. Partial edentulousness in a rural population based on Kennedy's classification: an epidemiological study. *The Journal of Indian Prosthodontic Society*. 2009 Jan 1;9(1):18.
28. Reddy PS, Reddy AS, Jain AR, Pradeep R. Tooth loss prevalence and risk indicators in an isolated population of Kadapa-South India. *American Journal of Public Health Research.* 2014 Jan 23; 2(6):221-5.
29. Renvert S, Persson RE, Persson GR. Tooth loss and periodontitis in older individuals: results from the

Swedish National Study on Aging and Care. *Journal of periodontology*. 2013 Aug;84(8):1134-44.
30. Shah N, Parkash H, Sunderam KR. Edentulousness, denture wear and denture needs of Indian elderly–a community-based study. *Journal of oral rehabilitation*. 2004 May 1;31(5):467-76.
31. Slade GD, Spencer AJ. Social impact of oral conditions among older adults. *Australian Dental Journal*. 1994 Dec 1;39(6):358-64.
32. Steele J, Treasure E, Pitts N, Morris J, Bradnock G. Total tooth loss in the United Kingdom in 1998 and implications for the future. *British Dental Journal*. 2000 Dec 9;189(11):598.
33. Suominen-Taipale AL, Alanen P, Helenius H, Nordblad A, Uutela A. Edentulism among Finnish adults of working age, 1978–1997. *Community dentistry and oral epidemiology*. 1999 Oct 1;27(5):353-65.
34. Susin C, Oppermann RV, Haugejorden O, Albandar JM. Tooth loss and associated risk indicators in an adult urban population from south Brazil. *Acta Odontologica Scandinavica*. 2005 Jan 1;63(2):85-93.
35. Thomas-Weintraub A. Dental needs and dental service use patterns of an elderly edentulous population. *The Journal of prosthetic dentistry*. 1985 Oct 1;54(4):526-32.
36. Thompson GW, Kreisel PS. The impact of the demographics of aging and the edentulous condition on dental care services. *The Journal of prosthetic dentistry*. 1998 Jan 31;79(1):56-9.
37. Udani TM. Age incidence of Indian patients in need of full denture service. *J Ind Dent Assoc*. 1954.
38. Weintraub JA, Burt BA. Oral health status in the United States: tooth loss and edentulism. *Journal of dental education*. 1985 Jun 1;49(6):368-78.
39. World Health Organization, *Oral Health Surveys: Basic Methods*, World Health Organization, Geneva, Switzerland, 4thedition, 1997.
40. Xie Q, Ainamo A: Association of edentulousness with systemic factors in elderly people living at home, CDOE 1999; 27: 202-9.

**How to cite this article:**

Devika Chakravarty *et al*.2017, Incidence, Aetiology And Consequences of Tooth Loss in Adult Population: An Area Based Cross-Sectional Study. *Int J Recent Sci Res.* 8(9), pp. 19917-19922. DOI: http://dx.doi.org/10.24327/ijrsr.2017.0809.0787

*******