



PROSTHETIC STATUS AND NEEDS IN PATIENTS VISITING DENTAL TEACHING HOSPITALS OF PESHAWAR.

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ABSTRACT... Objectives: The study aimed to collect the data regarding prosthetic status and need. **Study Design:** Cross sectional study. **Setting:** Three Teaching Dental Hospitals of Peshawar. **Period:** October to December 2017. **Materials and Methods:** Participants was given a pre-structured questionnaire which was designed to collect information regarding prosthetic need and prosthetic status. It consisted of two parts—the first part recorded data on socio-demographic factors (age, gender, educational level, socioeconomic status), while the second recorded the prosthetic status and need. **Results:** A total of 600 subjects were included comprising of 310 (51.6%) males and 290 (48.3%) females. The age ranged from 15 to 88 years with mean age 35 years. A total of 199 (33.1%) respondents were uneducated and 400 were educated. Out of 400, 63 (10.5%) had primary education, 167 (27.8%) had secondary education, 91 (15.1%) were graduates and 79 (13.1%) had a post-graduation There was significance difference found between age, education, socioeconomic status and prosthetic status. ($p=0.000, 0.000, 0.004$). There was no significance difference in prosthetic status between genders. There was significance difference found between education, socioeconomic status and prosthetic need (P value is 0.000, 0.012). There was no statistical significance found with respect to gender and prosthetic need. **Conclusion:** Hence, it can be concluded that most of the prosthetic needs of the studied population were unmet with prosthetic needs being approximately two fold greater than the prosthetic status.

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INTRODUCTION

Oral health is an integral part of general health and awareness about oral health plays a significant role in determining the dental health of a person.¹ With increasing age, changes appear in the oral cavity partly due to normal wear and tear and also, due to certain diseases that become common as age advances.²

Tooth loss is shown to be an important deterrent to oral health and has proven to adversely affect the dietary intake and nutritional status of individuals³, hence, leading to a compromise in general health and substantially reducing the quality of life.³ The major reason for tooth loss has been attributed to poor oral health, periodontal disease⁴ and dental caries.² Oral diseases alone do not contribute to tooth mortality but a variety

of non-disease indicators also play a role. These include socio-demographic and socioeconomic factors, education, dental attitudes and dental utilization behaviors.³ Moreover, psychosocial factors as well as age, gender, lifestyle (dietary habit, smoking, alcohol intake, etc.) and oral health behavior may modify the progression of oral diseases/disorders.³

Various studies in the past have revealed that socioeconomic status and education level have a strong association with oral health.⁵ Dental health has improved considerably over the past century, being considerably better among the people belonging to high socioeconomic status.⁶ Findings from recent studies show that people with low and very low incomes are 5 times more likely to have a poor oral health status compared

to those with high incomes.⁷ In addition, a higher level of education is commonly related to better oral health and quality of life.⁷ Higher level of education also ensures the possibility to attain and understand information regarding oral health.⁷

Dental prosthesis has the ability to reduce and in many cases eliminate the deficits attributed to lost teeth.³ Prosthodontic rehabilitation is very important in patients with post endodontic therapy and who are completely or partially edentulous, because it improves their chewing ability, digestion, aesthetics, and as a result, their quality of life.^{8,9,10}

In order to promote oral health of a population, it is imperative to know their prosthetic status and needs.^{11,12,13,14,15,16} However, there is a major discrepancy between prosthetic need and their fulfillment via treatment. This issue needs to be addressed and calls for a thorough assessment of the current prosthetic status and a proper healthcare plan accordingly. From the extensive literature review it was found that there is limited data available regarding prosthetic status and needs of the population of Peshawar region.⁸ Hence, it is essential to collect baseline data for policy formulation, planning, monitoring and to evaluate oral health services.¹⁷ Therefore, the present study was aimed to collect the base line data regarding prosthetic status and need and their relation to age, gender, socioeconomic status and educational level, which helps dentists as well as policy makers to address this issue.

MATERIALS AND METHODS

This cross sectional study was conducted in October to December, 2017 and included patients reporting to three teaching dental hospitals of Peshawar i.e. Peshawar Dental Hospital, Sardar Begum Dental Hospital & Khyber College of Dentistry. The study was conducted to find out a relationship between the prosthetic status and prosthetic need and compared that with age, gender, socioeconomic status and educational level of patients reporting to the aforementioned dental teaching hospitals of Peshawar.

The inclusion criteria were based on two factors

i.e. age and permanent dentition. Patients aged 15 years or above with permanent dentition were considered for the study. Subjects were informed thoroughly after which their verbal consent was obtained.

Participants were given a pre-structured questionnaire which was designed to collect information regarding prosthetic need and prosthetic status. It consisted of two parts—the first part recorded data on socio-demographic factors (age, gender, educational level, socioeconomic status), while the second part contained a section of the World Health Organization (WHO) oral health assessment form (1997) to record the prosthetic status and need.

Socioeconomic status was determined using minimum wages that vary according to each class in this society. The lower, middle, and high classes were divided using the minimum income earned by an individual per month. These were as follows:

- 0-15,000 (Low socioeconomic status)
- 15,000-50,000 (Middle socioeconomic status)
- 50,000 and above (High socioeconomic status)

The level of education attained by each patient was found out by inquiring how many years they spent in an educational institute and was classified into four groups:

Uneducated (spending no time in an educational institute),
 Primary (up to fifth grade),
 Secondary (up to twelfth grade),
 Graduate (holding a bachelor's degree) and Post graduate (holding university degree).

The data regarding their oral health status was obtained through verbal interviews and direct intra-oral examination of the study subjects. The following criteria were used during examination.

Prosthetic Status

- 0 – No prosthesis
- 1 – Fixed Partial Denture
- 2 – More than one Fixed Partial Denture
- 3 – Partial denture

- 4 – Both Fixed Partial Denture and partial denture(s)
 5 – Full removable denture
 9 – Not recorded

Prosthetic Need

- 0 – No prosthesis needed
 1 – Need for one-unit prosthesis
 2 - Need for multi-unit prosthesis
 3 - Need for combination of one-and/or multi-unit prosthesis
 4 - Need for full prosthesis (replacement of all teeth)
 9 – Not recorded

Intra oral examination was conducted by various examiners trained by the principal investigator. The examination was conducted on a dental chair with the help of sterile examination instruments.

The data was analyzed using SPSS version 23.

RESULTS

In the present study, a total of 600 subjects were included comprising of 310 (51.6%) males and 290 (48.3%) females (ratio of 1.07:1). The age ranged from 15 to 88 years with mean age 35 years. (Table-I)

Age Range (Years)	Frequency (%)
11-20	53 (8.8%)
21-30	213 (35.5%)
31-40	156 (26%)
41-50	98 (16.3%)
51-60	56 (9.3%)
61-70	16 (2.7%)
71-80	5 (0.8%)
81-90	3 (0.5%)

Table-I. Age wise distribution of respondents

A total of 199 (33.1%) respondents were uneducated and 400 were educated. Out of 400, 63 (10.5%) had primary education, 167 (27.8%) had secondary education, 91 (15.1%) were graduates and 79 (13.1%) had a post-graduation (Table-II).

Education Level	Frequency (%)
Uneducated	199 (33.1%)*
Primary	63 (10.5%)
Secondary	167 (27.8%)
Graduate	91 (15.2%)
Postgraduate	79 (13.2%)

Table-II. Educational level of respondents

According to socioeconomic status 325 (54.2%) participants belonged to lower socioeconomic class whereas 230 (38.3%) individuals belonged to middle socioeconomic class and 45 (7.5%) participants belonged to high socioeconomic class (Table-III).

Socioeconomic Status	Frequency (%)
Low socioeconomic status	325 (54.2%)*
Middle socioeconomic status	230 (38.3%)
High socioeconomic status	45 (7.5%)

Table-III. Socioeconomic status of the respondents

Demographic wise Prosthetic Status of the participants

Age

94% of the participants aged between 11-20 years had no prosthesis. Fixed partial denture was common in 10.3% individuals aged 31-40 years and more than one fixed partial denture was common in 20% individuals aged 71-80 years. Removable partial denture was common in 18.8% persons aged 61-70 years, whereas both fixed and removable partial dentures were common in 33.3% people aged 81-88 years. Complete denture was common in 6.3% people in the age range 61-70 years. There was significance difference found between age and prosthetic status. ($p=0.000$).

Gender

In the current study sample, individuals having no prosthesis were common having a gender distribution of 236 (39.3%) male and 230 (38.3%) females (Figure-1). Whereas the number of males with prosthesis 23.9% was slightly higher than females 20.7%. There was no significance difference in prosthetic status between genders.

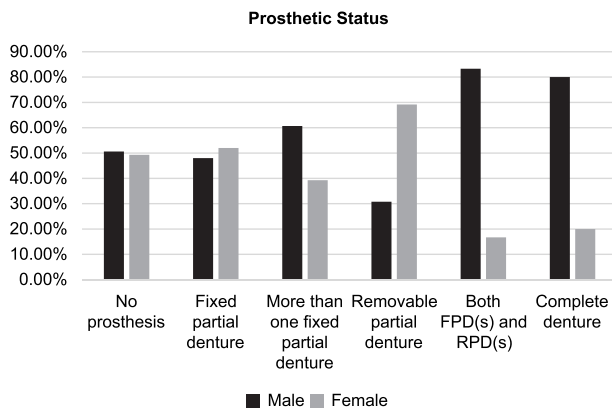


Figure-1

Education

Individuals having no prosthesis were common in the graduate group 83.7%. Fixed partial denture was common in 12.7% individuals with primary education. Moreover, 27.8% participants with post graduate degree had more than one fixed partial

denture. Participants with no education had more cases of removable partial denture (4%) and both removable and fixed partial denture (1.5%) than other groups. Whereas complete denture was common in only 1.8% subjects with secondary education (Table-IV). There was significance difference found between level of education and prosthetic status. (p=0.000).

Socioeconomic Status

Individuals belonging to the lower class had more cases of no prosthesis (82.5%). Individuals belonging to middle class had more cases of more than one fixed partial dentures (15.7%), removable partial dentures (2.6%) and complete dentures (1.7%). Individuals belonging to upper class had more cases of fixed partial dentures (15.6%) and both fixed and removable partial dentures (2.2%) as shown in Table 5. Significant difference was found between socioeconomic and prosthetic status (p=0.004).

	No Prosthesis	Fixed Partial Denture	More than one Fixed Partial Denture	Removable Partial Denture	Both FPD(s) and RPD(s)	Complete Denture	Not Recorded	Total
Uneducated	159(80%)	13(6.5%)	15(7.5%)	8(4%)*	3(1.5%)*	1(0.5%)	0	199
Primary	48(76.2%)	8(12.7%)*	7(11.1%)	0	0	0	0	63
Secondary	133(79.6%)	13(7.8%)	14(8.4%)	2(1.2%)	2(1.2%)	3(1.8%)*	0	167
Graduate	77(83.7%)*	10(10.9%)	3(3.2%)	1(1.1%)	0	1(1.1%)	0	92
Postgraduate	49(62%)	4(5%)	22(27.8%)*	2(2.5%)	1(1.2%)	0	1(1.2%)	79
Total	466(77.7%)	48(8%)	61(10.2%)	13(2.2%)	6(1%)	5(0.8%)	1(0.1%)	

Table-IV. Education level and prosthetic status of respondents

	No Prosthesis	Fixed Partial Denture	More Than one Fixed Partial Denture	Removable Partial Denture	Both FPD(s) and RPD(s)	Complete Denture	Not Recorded	Total
Lower socioeconomic class	268 (82.5%)*	28 (8.62%)	20 (6.2%)	7 (2.2%)	1 (0.3%)	1 (0.3%)	0	325
Middle socioeconomic class	166 (72.2%)	13 (5.6%)	36 (15.7%)*	6 (2.6%)*	4 (1.7%)	4 (1.7%)*	1 (0.4%)	230
Upper socioeconomic class	32 (71.1%)	7 (15.6%)*	5 (11.1%)	0	1 (2.2%)*	0	0	45
Total	466 (77.7%)	48 (8%)	61 (10.2%)	13 (2.2%)	6 (1%)	5 (0.8%)	1 (0.2%)	

Table-V. Socioeconomic status and prosthetic status of respondents

Demographic wise prosthetic need of the participant

Age

Majority of the participants in the age group 15-20 years did not need any prosthesis 77.3%. On average, one-unit prosthesis was required in 20.5% of participants aged 31-40 years. Multiunit fixed prosthesis was required in 30.4% individuals aged 51-60 years. Those requiring a combination of one and multi-unit prosthesis (37.5%) were aged 61-70 years. Whereas complete denture was required in 66.7% individuals aged 81-90 years.

Gender

In the current study, 51% of males and 43.9 % females did not need any prosthesis, whereas 49% males and 56.1% females needed prosthesis of some kind. There was no statistical significance found with respect to gender and prosthetic need (Figure-2).

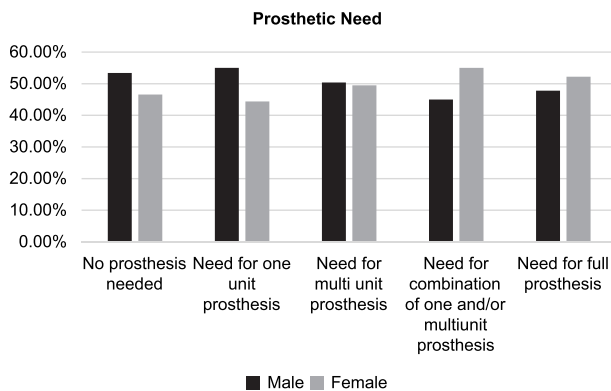


Figure-2

Education

In the uneducated group 41 (20.6%) people required a multiunit prosthesis, 39 (19.6%) people required a combination of single and multiunit prosthesis whereas 16 (9.5%) people required complete denture. No prosthesis 87 (52%) and single unit prosthesis 29 (17.3%) were common in subjects with secondary education as shown in Table 6. Significant difference was found between level of education and prosthetic need (P value is 0.000).

Socioeconomic Status

The study revealed that need for no prosthesis was highest in the upper socioeconomic group 62.3%. One-unit prosthesis was required more in low socioeconomic group 16.9%. In middle socioeconomic class 21.7% need for multi-unit, 22.1% needed combination of one and multi-unit prosthesis, and 4.8% needed full prosthesis, was highest in middle class individuals as presented in Table-VII. There was significance difference found between socioeconomic status and prosthetic need (P value is 0.012).

DISCUSSION

Studies related to assessment of prosthetic status and prosthetic needs in dental teaching institutions are rarely conducted in Pakistan. There is no documented data available for the prosthetic status and needs therefore, an attempt was made to assess the prosthetic status and need of the patients. Results of this study showed that majority of participants below 20 years of age were dentate.

	No Prosthesis Needed	Need for One-unit Prosthesis	Need for Multi-unit Prosthesis	Need for a Combination of One and/or Multi-unit Prosthesis	Need for Full Prosthesis	Not Recorded	Total
Uneducated	77(38.7%)	26(13%)	41(20.6%)	39(19.6%)	16(8%)*	0	199
Primary	32(50.8%)	11(17.5%)*	10(15.9%)	10(15.9%)	0	0	63
Secondary	87(52.1%)	29(17.4%)	27(16.2%)	20(12%)	3(1.8%)	1(0.6%)	167
Graduate	53(57.6%)*	15(16.3%)	19(20.7%)*	3(3.3%)	2(2.2%)	0	92
Postgraduate	30(38%)	9(11.4%)	10(12.7%)	28(35.4%)*	2(2.5%)	0	79
Total	279(46.5%)	90(15%)	107(17.8%)	100(16.7%)	23(3.8%)	1(0.2%)	600

Table-VI. Education level and prosthetic need of respondents

	No Prosthesis Needed	Need for One-unit Prosthesis	Need for Multi-unit Prosthesis	Need for a Combination of One and/ or Multi-unit Prosthesis	Need for Full Prosthesis	Not Recorded	Total
Lower socioeconomic class	162 (49.8%)	55 (16.9%)*	53 (16.3%)	45 (13.8%)	10 (3%)	0	325
Middle socioeconomic class	89 (38.7%)	28 (12.2%)	50 (21.7%)*	51 (22.1%)*	11 (4.8%)*	1 (0.4%)	230
Upper socioeconomic class	28 (62.3%)*	7 (15.6%)	4 (8.9%)	4 (8.9%)	2 (4.4%)	0	45
Total	279 (46.5%)	90 (15%)	107 (17.8%)	100 (16.7%)	23 (3.8%)	1 (0.2%)	600

Table-VII. Socioeconomic status and prosthetic need of respondents

Middle age group showed various degrees of partial edentulousness gradually being replaced by complete edentulousness with increasing age. It is evident from the collected data that with the advancement of age, requirement of more prostheses was noted in this study which is similar to other studies by George et al¹⁸, and Hamasha et al¹⁹ i.e need for multiunit prosthesis were more for middle age group while full removable denture was the requirement of individual above 50 years. Higher need may be attributed to tooth loss associated with an increase in age. This is in accordance with trends reported in studies conducted by Angelillo et al²⁰, Crabb²¹, Hobdell et al²², Liss et al²³ and Varelzides et al²⁴, Prateek et al.²⁵ There were fewer participants in above fifty years' age group which may be due to a lower priority given to dental health services as compared to medical services by geriatric individuals¹¹. Current study revealed that majority (77.7%) of total population examined did not have any prosthesis. Our results are in agreement with study done by Soh et al²⁶, while studies by Choudhury¹⁷, Nerby and Hedge^{27,28} showed that a total of 88% of population didn't have any prosthesis i.e more population without prosthesis than our study. This low proportion of participants with prosthesis may be due to lack of awareness, financial difficulties and may be associated with limited mobility in old age.^{29,30,31,32,33,34,35,36,37,38} In contrast, studies by Hawkins et al³⁹ (1998) reported 80% of subjects wore at least one denture and Angelillo et al.²⁰ (1990) reported 44.3% of the edentulous patients wore complete

dentures. Cardoso et al³³ reported higher use of upper (79.2%) and lower (37.1%) total prostheses among the elderly people of Manaus city as a result of higher utilization of dental services by them. This difference is due uneducated population and low socioeconomic status as evident from our study.

The prosthetic status was slightly better in males 23.9% than in females 20.7% which is similar to a study by Shenoy and Hedge.²⁸ This may be attributed to females' dependency on male members of the families to provide access to treatment facilities. Also, according to our study the proportion of uneducated females (48.3%) was higher compared to males (19%). Hence, a lower level of education and employment could be possible reasons for females having less prostheses than males. There was no statistical difference between genders regarding the prosthetic status and need which is in accordance with the findings of Merselet al³¹, Shroff²⁹ and Mulay³⁰, and Master.

A higher percentage of respondents in the upper socioeconomic group had prosthesis of some kind, compared to those in the lower socio economic groups. The social pressure of maintaining esthetics and function in upper class may influence people to replace their missing teeth. Additionally, attitude and awareness towards dental care, and cost of dental treatment might also contribute significantly to prosthetic status in a person.^{11,13} Less percentage (38%)

subjects in the upper socio-economic categories needed prosthesis of some kind, compared to those in the lower socio-economic categories 50%. This shows better attitude and awareness toward dental care among subjects in the upper socio-economic categories. These findings are supported by other similar studies.^{38,39,40} 53.3% of the subjects were in need of either fixed, removable or combined prosthodontic treatment, and there was no statistically significant difference among genders. Prosthetic needs in the present study were found to be lower than findings by Mann J et al.³⁴ (1985) 76% in Israel and 72% by Shah et al¹² in India. Even lower findings were reported by Miyazaki et al³⁵ in Japan where prosthetic need was 36%. Prosthetic needs of our study population were high. This is similar to an article by Choudhury et al¹⁷ who reported 67.49% and 64.31% prosthetic need for upper and lower arches respectively. Other studies have shown the prosthetic needs of the study subjects in the range of 51.5% to 59.7 % which is similar to our results (Hongalet al³⁷ Nadgere et al¹¹).

Differences in prosthetic treatment need between genders have been reported by Palmqvist³² and Shah² where males showed a higher degree of prosthodontic need. In the current study, the need for one-unit and multi-unit prostheses was higher in males. Whereas the need for a combination of one and multi-unit, and full prosthesis was higher in females. Our study reported a higher overall need for multiunit prosthesis which is similar to study by Shenoy and Hegde²⁸ (2010) in Mangalore where the need for multi-unit prostheses was more than the need for one-unit prostheses. Different results were reported by Goel P et al³⁶ and Christensen J. Also, Hongalet al³⁷ reported that need for one unit prostheses exceeded 21.75% that of multi-unit prostheses.

Hence, it can be concluded that most of the prosthetic needs of the studied population were unmet with prosthetic needs (53.3%) being approximately two fold greater than the prosthetic status (22.2%). Factors such as lack of awareness, social pressure and attitude to maintain good and healthy teeth may result in the lack of dental service utilization in low class individuals

(Chandra Shekar¹⁴, 2010). This emphasizes that even if cost barrier is removed, these individuals will not avail dental facilities.

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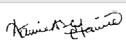
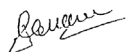


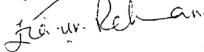
REFERENCES

1. Shigli K, Hebbal M, Angadi GS (2009) **Prosthetic status and treatment needs among patients attending the prosthodontic department in a dental institute in India.** Eur J Prosthodont Restor Dent 17(2):85–89.
2. Shah N, Parkash H, Sunderam KR (2004) **Edentulousness, denture wear and denture needs of Indian elderly: A community based study.** J Oral Rehabil 31:467–476.
3. Pallegedara C, Ekanayake L (2005) **Tooth loss, the wearing of dentures and associated factors in Sri Lankan older individuals.** Gerodontology 22:193–199.
4. Cimões R, Caldas Júnior AD, Souza EH, Gusmão ES. **Influence of social class on clinical reasons for tooth loss.** Ciencia & saude coletiva. 2007 Dec;12(6):1691-6.
5. Mack F, Mundt T, Jørgensen EB, Mojon P, Schwahn C, Bernhardt O, Gesch D, John U, Biffar R, **Prosthodontic status among old adults in Pomerania, Related to income, Education level, and General Health (Results of the study of health in Pomerania, SHIP)** The international journal of prosthodontics 2003; 16(3): 313-318.
6. Thorstensson H, Johansson B (2010) **Why do some people lose teeth across their lifespan whereas others retain a functional dentition into very old age?** Gerodontology 27(1):19–25.
7. Esan TA, Olusile AO, Ojo MA, Udoye CI, Oziegbe EO, Olasoji HO (2010) **Tooth loss among Nigerians treated in teaching hospitals: A national pilot study.** J Contemp Dent Pract 11(5):17–24.
8. Gonsalves WC, Wrightson AS, Henry RG. **Common oral conditions in older persons.** Am Family Physician 2008; 78: 845-852.
9. Bedi R, Gulati N, McGrath C. **A study of satisfaction with dental services among adults in the United Kingdom.** British Dental Journal 2005; 198: 433-43.
10. National Institute on Aging/National Institutes of Health/ U.S. **Department of health and human services. Rising numbers of the oldest old.** In: Why Population Aging Matters: A Global Perspective (pp. 10-15). Bethesda, MD: NIA/NIH; 2007.

11. Nadgere J, Doshi AG, Kishore S. **An evaluation of prosthetic status and prosthetic need amongst people living in and around Panvel, Navi-Mumbai-A survey.** *Int J Prosthet Dent* 2010; 1:6-9.
12. Burt BA, Eklund SA. **Tooth loss. Dentistry, dental practice and the community.** 5th ed. Philadelphia: WB Saunders Company; 2005. p. 203-11.
13. G Ajay Kumar, G Maheswar, S Malathi, K Sridevi, P Ratnakar, B Someshwar **Dental prosthetic status and prosthetic needs of the institutionalized elderly living in geriatric homes in Hyderabad: A Pilot Study.** *The Journal of Contemporary Dental Practice*, November-December 2013; 14(6):1169-1172.
14. Chandra Shekar, 2010 **Prosthetic status and prosthetic needs in relation to socioeconomic factors among the municipal employees of Mysore city.** *Indian Journal of Dental Advancements.* 2(1).
15. Vrinda R. Shah • Darshana N. Shah • Chaitanya H. Parmar. **Prosthetic status and prosthetic need among the patients attending various dental institutes of Ahmedabad and Gandhinagar district, Gujarat.** *J Indian Prosthodont Soc* (July-Sept 2012) 12(3):161-167.
16. Shrivastav A, Bhambal A, Reddy V, Jain M. **Dental prosthetic status and needs of the residents of geriatric homes in Madhya Pradesh, India.** *J Int Oral Health.* 2011 Aug 1;4:9-14.
17. Gopal Krishna Choudhury¹, Suneel V Vadavadi², K V Halini Kumari³, Ravikiran⁴, Rashmi B Mandokar⁵, K Prathima⁶ **Prosthetic status and prosthetic needs of patients attending the prosthodontic department of a dental teaching institution,** *India Journal of International Oral Health* 2016; 8(3):338-343.
18. George B, John J, Saravanan S, Arumugham IM. **Prevalence of permanent tooth loss among children and adults in a suburban area of Chennai.** *Indian J Dent Res* 2011; 22(2):364.
19. Hamasha AA, Sasa I, Al-Qudah M. **Risk indicators associated with tooth loss in Jordanian adults.** *Community Dent Oral Epidemiol* 2000; 28(1):67-72.
20. Angelillo IF, Sagliocco G, Hendricks SJH, Villari P. **Tooth loss and dental caries in institutionalized elderly in Italy.** *Comm Dent Oral Epidemiol* Aug 1990; 18(4): 216-218. 5.
21. Faulkner RK, Crabb HS. **Tooth mortality in a selected population in Leeds, UK.** *Community dentistry and oral epidemiology.* 1983 Dec;11(6):375-8.
22. Hobdell MH, Sheiham A, Slack GL. **Patterns of tooth loss in British populations.** *Br. Dent J;* 1969 April; 15: 349-351.
23. Liss J, Evenson P, Loewy S, Ayer WA. **Changes in the prevalence of dental disease.** *Bureau of Economic and Behavioural Research, Council on Dental Health and Health Planning.* *J Am Dent Assoc* 1982 July; 105(1): 75-79.
24. Varelzides A, Komboli M, Tsami A, Mitsis P. **Pattern of teeth loss in a selected population in Greece.** *Comm Dent Oral Epidemiol* 1986; 14: 349-352.
25. Prateek S, Kashyap B, Pankaj G, Renuka S. **Edentulousness and prosthetic needs of a rural population in southern India.** *J of Indian Prosth.Soc,* March 2001; 1(1): 20-24.
26. Soh G, Chong YH, Ong G. **Dental prosthetic status and needs of an elderly population living in long-term care facilities in Singapore.** *J Community Health* 1992;17(5):175-81.
27. Narby B, Kronström M, Söderfeldt B, Palmqvist S. **Prosthodontics and the patient. Part 2: Need becoming demand, demand becoming utilization.** *Int J Prosthodont.* 2007 Mar-Apr; 20(2):183-9.
28. Shenoy RP, Hegde V. **Dental prosthetic status and prosthetic need of the institutionalized elderly living in geriatric homes in mangalore: A pilot study.** *ISRN Dent* 2011; 2011:987126.
29. Shroff BC. **Edentulousness in India.** *Ind Dent Assoc. National Workshop on "Oral health goal"* June 1984; 17-20, Bombay. 12.
30. Nadgere JB, Doshi AG. **An evaluation of prosthetic status and prosthetic need amongst people living in and around Panvel, Navi-Mumbai-A Survey.** *International Journal of Prosthetic Dentistry.* 2010 Dec 18;11(1):6-9.
31. Mersel A, a NAISE JZ, Shem Tov A. **Prosthetic needs and demands for services of a group of elderly people in Isrel.** *Comm Dent Oral Epidemiol.* 1984; 12:315-318.
32. Palmqvist S. **Treatment needed and received in an elderly Swedish county population.** *Gerodontology* 1988; 4:272-276.
33. Cardoso EM, Parente RCP, Vettore MV, Rebelo MB. **Oral health conditions of elderly residents in the city of Manaus.** *Rev Bras Epidemiol* 2011; 14(1):1-10.
34. Mann J, Mersel A, Gabai E. **Dental status and dental needs of an elderly population in Israel.** *Community Dent Oral Epidemiol* 1985 Jun; 13(3):156-158.

35. Miyazaki H, Shirahama R, Ohtani I, Shimada N, Takehara T. **Oral health conditions and denture treatment needs in institutionalized elderly people in Japan.** Community Dent Oral Epidemiol 1992; 20(5):297-230/
36. Goel P, Singh K, Kaur A, Verma M. **Oral healthcare for elderly: Identifying the needs and feasible strategies for service provision.** Indian Journal of Dental Research 2006; 17:11-21.
37. S Hongal, NA Torwane, BR Chandrashekhar, V Saxena and KR CHavan. **An evaluation of dental prosthetic needs among eunuchs (Trans Genders) residing in Bhopal City, Madhya Pradesh, India: A Cross-sectional study.** Ann Med Health Sci 2014 4(6): 943-948.
38. Teodora Timiș, Dănilă I 2005 **Socioeconomic status and oral health.** The Journal of Preventive Medicine; 13 (1-2): 116-121.
39. Hawkins RJ, Main PA, Locker D. **Oral health status and treatment needs of Canadian adults aged 85 years and over.** Spec Care Dentist 1998; 18(4):164-9.
40. Christensen J. **Oral health status of 65 to 75 years old Danes; A preliminary report of the replication of WHO's international collaborative study in Denmark.** J Dent Res 1977; 56:149-153.

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