*Indian Journal of Forensic Medicine and Toxicology*
*Volume 16 No. 4, October-December 2022*

# Dental Prosthetic Status and Prosthetic Needs of Geriatric Population: A Cross Sectional Study

**Arun A[1], Vidya K Shenoy[2], Kavishma Sulaya[3], Prashasthi Shetty[4], Sharanya Adhikari[5], Adarsh Hegde[6]**

**[1]D-Care Dental Clinic, Consultant Prosthodontist, Kerala, [2]Professor and Head, Department of Prosthodontics, AJ Institute of Dental Sciences, Mangalore, India, [3]Assitant Professor, Department of Prosthodontics, Manipal College of Dental Sciences, Manipal, Manipal Academy of Higher education, Manipal, India, [4-6]Assistant Professor, Department of Prosthodontics, AJ Institute of Dental Sciences, Mangalore, India.**

**How to cite this article:** Arun A, Vidya K Shenoy, Kavishma Sulaya. Dental Prosthetic Status and Prosthetic Needs of Geriatric Population: A Cross Sectional Study. Indian Journal of Forensic Medicine and Toxicology 2022;16(4).

**Abstract**

**Objective**: Oral health is considered as an indicator for health and quality of life in geriatric patients. It becomes essential to assess the prosthetic status and need in order to promote oral health. Hence, a survey was conducted on geriatric patients visiting a dental teaching institute in India.

**Materials and Method**: A cross-sectional survey was conducted among geriatric population aged above 60.The sample size was estimated to be 570. The information related to prosthetic status, prosthetic need was obtained using the World Health Organisation Oral Health Assessment Form 1997. Chi-square test was used to analyse the data.

**Results:** Out of 570 elderly people, 308 were males and 262 were females. The study results showed that 77% and 78% of the total subjects had no prostheses in maxillary and mandibular arch, respectively. Prosthetic status was better in males than in females. The level of prosthetic need was higher in females (82%) in mandibular arch compared to males (75%). In the age group of 80-85years need for complete denture was more. Requirement for single and multi unit prosthesis was higher in age groups of 60-65 years. Less percentage of subjects in the upper socio-economic categories needed prosthesis compared to those in the lower socio-economic categories

**Conclusion:** Unmet prosthetic needs were more in geriatric population attending the institutional outpatient department. There was no significant association of gender with prosthetic status and need and significant association was observed between age and socioeconomic status with prosthetic status and need.

**Keywords:** Prosthetic status, prosthetic need, complete denture, geriatric population.

## Introduction

The lifespan of an individual has improved with the advancements in the field of medical science and improvement in social conditions.[1] Oral health is an important part of general health and plays a crucial role in improving the quality of life.[2] An improved

**Corresponding Author: Vidya K Shenoy**, Professor and Head, Department of Prosthodontics, AJ Institute of Dental Sciences, Mangalore, India.

**E-mail:** vidyakshenoy@ajids.edu.in

oral health allows geriatric patients to gain self-confidence, increase social networking, physical and mental well being[3]. Untreated dental caries and periodontal diseases can lead to tooth loss which is quite common in developing countries such as India[4].

Often oral health is ignored because of the poor awareness and financial constraints. It is usually sought only for emergencies such as pain relief. Hence, extraction of painful tooth is an only option, which makes the person partially or completely edentulous.[4] Usually, the prosthodontic treatment is denied by most of the patients due to the expense prevailing it.[4] Systematic assessment of prosthetic treatment needs is essential to determine unmet oral health care needs and to bring about beneficial change to the oral health of the population.

Individuals with poor dentition consume soft, easily chewable foods that are low in dietary fiber and have low nutrient density which may affect the general health. Therefore, for optimum oral health in geriatric population, there is a need to find out prosthetic status and prosthetic need. The baseline information extracted may help health agencies to formulate policy, plan and monitororal health services.[5] Hence, the objective of this study was to evaluate the prosthetic status and treatment needs of geriatric population attending a dental institution in India.

## Materials and Methods

A cross sectional study was conducted among the geriatric patients who visited the outpatient department of Prosthodontics, of a dental institution in India. Sample size was estimated to be 570. The inclusion criteria considered were participants aged 60 years and above who were willing to provide signed informed consent.

Data on general information of the participants was collected as per Annexure II. Modified Kuppuswamy socio-economic scale was used to classify subjects according to socio-economic status.[6]

Prosthetic status and needs was clinically assessed according to the criteria described by the World Health Organization (WHO) and Oral Health Assessment form 1997.[7]

Data was analysed using the statistical package SPSS 22.0 (SPSS Inc., Chicago, IL)

and level of significance was set at $p<0.05$. Descriptive statistics was performed to assess the proportion of each category of the respective groups. Normality of the data was assessed using Shapiro Wilkinson test. Inferential statistics to find out the difference between the groups was done using chi square test to find out the association between the groups. The level of significance was set at <0.05. Analysis was done using chi-square test**.**

The study was conducted after obtaining permission from the institutional ethics committee.

## Results

A total of 570 subjects comprising 262 females (46%) and 308 males (54%) aged 60 years and above (mean age 71.2±7.7 years) formed the study population.

77% and 78% of the subjects had no prosthesis in their maxillary arch and in mandibular arch respectively. Evaluation of prosthetic status showed no significant differences between the gender in the maxillary ($X2 = 0.509$; $P = .99$) and mandibular arches ($X2 = 6.075$; $P = .29$) respectively. No significant association between prosthetic status and gender ($p<0.05$)

(Table 1). The need was highest for complete prosthesis (37% and 38% in the maxillary and mandibular arch) followed by the need for a multiunit prosthesis (28% and 24% in maxillary arch mandibular arch); 23% and 22% subjects did not require any prosthesis in maxillary arch and mandibular arches respectively. Evaluation of prosthetic needs showed no significant differences between the gender in the maxillary arch ($X2 = 0.535$; $P = .97$) and mandibular arch ($X2 = 2.579$; $P = 0.63$) respectively. No significant association was found between prosthetic needs and gender ($p<0.05$) (Table 2).

**Table 1: Distribution of study subjects according to gender & prosthetic status of their lower and upper arch.**

| Prosthetic status | Male (Lower) | Female (Lower) | Total | X2 value | P value | Male (Upper) | Female (Upper) | Total | X2 value | P value |
|---|---|---|---|---|---|---|---|---|---|---|
| No prosthesis | 230(75%) | 215(82%) | 445(78%) | 6.075 | 0.29 | 230(75%) | 215(82%) | 445(78%) | 0.509 | 0.99 |
| Bridge | 13(4%) | 6(2%) | 19(3%) | | | 13(4%) | 6(2%) | 19(3%) | | |
| More than one bridge | 2(0.6%) | 1(0.3%) | 3(0.5%) | | | 2(0.6%) | 1(0.3%) | 3(0.5%) | | |
| Partial denture | 37(12%) | 19(7%) | 56(10%) | | | 37(12%) | 19(7%) | 56(10%) | | |
| Both bridge & partial bridge | 1(0.3%) | 0 | 1(0.1%) | | | 1(0.3%) | 0 | 1(0.1%) | | |
| Full removable denture | 25(8%) | 21(8%) | 46(8%) | | | 25(8%) | 21(8%) | 46(8%) | | |
| Total | 308(100%) | 262(100%) | 570(100%) | | | 308(100%) | 262(100%) | 570(100%) | | |

*P<0.05 is statistically significant

**Table 2: Distribution of study subjects according to gender & the prosthetic need of their lower and upper arch.**

| Prosthetic needs | Male (Lower) | Female (Lower) | Total | X2 value | P value | Male (Upper) | Female (Upper) | Total | X2 value | P value |
|---|---|---|---|---|---|---|---|---|---|---|
| No prosthesis required | 78(25%) | 47(18%) | 125(22%) | 2.579 | 0.63 | 72(23%) | 57(23%) | 129(23%) | 0.535 | 0.97 |
| Need for single unit prosthesis | 30(10%) | 35(13%) | 65(11%) | | | 25(8%) | 20(8%) | 45(8%) | | |
| Need for multi-unit prosthesis | 75(24%) | 63(24%) | 138(24%) | | | 84(27%) | 76(30%) | 160(28%) | | |
| Needs for combination of single or multi-unit prosthesis | 10(3%) | 15(6%) | 25(4%) | | | 10(3%) | 13(5%) | 23(4%) | | |
| Need for full mouth prosthesis | 115(37%) | 102(39%) | 217(38%) | | | 117(38%) | 96(38%) | 213(37%) | | |
| Total | 308(100%) | 262(100%) | 570(100%) | | | 308(100%) | 262(100%) | 0.535 | | |

*P<0.05 is statistically significant

78% of the subjects had no prostheses in their mandibular arch. Among the age group of 60-65 years 83% of them did not have any prosthesis . 81% of the population in the age group of 65-70 years needed prosthesis in maxillary arch. Evaluation of subjects showed significant differences between the age and the prosthetic status of their maxillary ($X2$ =64.579; $P$ = 0.0001) and mandibular arches ($X2$ =54.413; $P$ = 0.0005).

Among the age group of 80-85, 72% needed complete prosthesis in the maxillary and mandibular arch. Need for multi unit prosthesis was highest in the age group of 60-65 years. Evaluation of subjects according to age and the prosthetic need of their maxillary arches showed significant differences between the age ($X2$ = 137.28; $P$ = .0.0001) whereas in the mandibular arch, the difference was significant ($X2$ = 150.811; $P$ = 0.0001).

86% of upper middle and lower middle class subjects had not opted for prosthetic rehabilitation in the upper arch. In mandibular arch 87% of lower middle-class subjects did not replace the missing teeth. Evaluation of subjects showed significant differences between the socioeconomic status and the prosthetic status of their maxillary ($X2$ =119.232; $P$ = 0.0001) and mandibular arches ($X2$ =103.259; $P$ = 0.0001). Significant association was found between prosthetic status of mandibular arch, maxillary arch and socioeconomic status (p<0.05)

The need of complete prosthesis was highest in lower middle-class subjects. Prosthetic need, according to socio-economic status was statistically significant in the maxillary ($\chi 2$ = 146.375, $P$ = 0.0001)

and mandibular arch ($\chi 2$ = 146.613, $P$ = 0.0001). Significant association was found between prosthetic need and socioeconomic status ($p<0.05$)

## Discussion

Prosthetic status among the geriatric patient was unsatisfactory which may be attributed to older people not using the available dental facilities, lack of awareness, financial constraints, reduced mobility, misconceptions about dentures and lack of interest. The result was similar to the studies done by Choudhury GK et. al.[5] and Soh et. al.[8]

Prosthetic status was better in males than in females which could be attributed to a lower level of education, lack of access, dependency on male members and unemployment. The difference was not significant.

The clinical possibilities to prosthetic replacement for each patient according to the missing teeth were significantly different from patient desire. The level of prosthetic need was higher in females in mandibular arch compared to males.

Patients aged 70 years and above had better prosthetic status compared to other age groups. This may be due to geriatric patients having lower expectations and frequently retaining them beyond their useful life which may be either due to economic circumstances or a learned pattern of functioning[9]. Prosthetic status was better with increasing age. Similar findings were found in study conducted by Pavan T P et. al.[11] This could be an indication of a lower subjective demand for prosthetic care among partially edentulous subjects when compared to edentulous subjects.[8]

Requirement for one-unit prosthesis was higher in age groups of 60-65 years (17% in mandibular arch, 8% in maxillary arch), the need for multi-unit prosthesis was higher in age group of 60-65 years (35% in mandibular arch and 39% in maxillary arch). The need for complete denture was more in age group of 80-85 years (72% both in maxillary and mandibular arch). Requirement of prosthesis increases with advancement of age with complete edentulism and the findings are in agreement with studies done by George et. al.[12], and Hamasha et. al.[13] Tooth loss without prosthetic intervention in elderly results in psychological feeling of inferiority, mental stress due to general appearance and malnutrition. Rehabilitation of the physical, psychological and social state of elderly, along with restoration of masticatory function plays a significant in improving the quality of life.[8]

Prosthetic status was better in lower socioeconomic group compared to the upper socioeconomic groups which is in agreement with the studies by Hanson et. al.[14] Eklund et. al.[15] The social pressure of maintaining aesthetics and functions in upper class may influence people to replace their missing teeth.[16]

An inverse relationship was observed between the socioeconomic status and prosthetic need.[9] Unmet prosthetic needs were approximately three-fold greater than the prosthetic status, which is a cause of concern. The probable reasons could be passivity of enthusiasm for aesthetics, scarcity of information, lack of availability of dental clinics, monetary limitations.

## Conclusion

Within the limitations of the study, the results showed that unmet prosthetic needs were more in geriatric population attending the institutional outpatient department. There was no significant association of gender with prosthetic status and need and a significant association of age and socioeconomic status with prosthetic status and need.

**Source of support:** Nil

**Conflict of interest**: None

## References

1. Shenoy RP, Hegde V. Dental prosthetic status and prosthetic need of the institutionalized elderly living in geriatric homes in Mangalore: ISRN dentistry. 2011; 2011:987126.
2. Patil VV, Shigli K, Hebbal M, Agrawal N. Tooth loss, prosthetic status and treatment needs among industrial workers in Belgaum, Karnataka, India. J Oral Res.2012; 54:285-92.
3. Sharma A, Thomas S, Dagli R, Solanki J, Bhateja GA, Hans RM. Prosthetic Status and Prosthetic Needs

of Institutionalized Elderly People in Jodhpur City, Rajasthan, India. J Oral Res. 2015; 6:13-9.

4. Bhatt S, Rajesh G, Rao A, Shenoy R, Mithun Pai BH, Nayak V. Tooth loss, prosthetic status, and prosthodontic treatment needs of an Indian fishing community. SRM J Res Dent Sci 2020; 11:30-4.
5. Choudhury GK, Vadavadagi SV, Kumari KH, Mandokar RB, Prathima K. Prosthetic status and prosthetic needs of patients attending the Prosthodontic Department of a Dental Teaching Institution, India. J Int Oral Health.2016; 8:338.
6. Khairnar MR, Wadgave U, Shimpi PV. Kuppuswamy's socio-economic status scale: a revision of occupation and income criteria for 2016.Indian J Pediatr 2017; 84:3-6.
7. World Health Organization, *Oral Health Surveys – Basic Methods*, World Health Organization, Geneva, Switzerland, 4th edition, 1997.
8. 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; 17:175-81.
9. Karunakar shetty et. al.Dental Prosthetic Status and Treatment Needs of Adult Population in Makkah Region of Saudi Arabia: A Survey Report. Int Health Res J. 2019;3:240-247.
10. Mersel A, Anaise JZ, Shem-Tov A. Prosthetic needs and demands for services of a group of elderly people in Israel. Community Dent Oral Epidemiol 1984; 12:315-8.
11. Pavan TP. et. al. Exploration of prosthetic status and treatment needs among elderly population in bangalore city. Int J Dent Health Sci. 2014; 1:451-458.
12. 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; 22:364.
13. Hamasha AA, Sasa I, Al-Qudah M. Risk indicators associated with tooth loss in Jordanian adults. Community Dent Oral Epidemiol 2000; 28:67-72.
14. Hanson BS, Liedberg B, Owall B. Social network, social support and dental status in elderly Swedish men. Community Dent Oral Epidemiol 1994; 22:331-7.
15. Eklund SA, Burt BA. Risk factors for total tooth loss in the United States; longitudinal analysis of national data. J Public Health Dent 1994; 54:5-14.
16. Khanal S, Bhattarai R, Rao GN, Shrestha S. Institutionalized elderly people oral health status and treatment needs assessment in Kathmandu district. J Dent Allied Sci 2018; 7:8-12.