J Indian Prosthodont Soc (Oct-Dec 2013) 13(4):587–592
DOI 10.1007/s13191-012-0231-9

ORIGINAL ARTICLE

# Dental Prosthetic Status and Prosthetic Needs of Institutionalised Elderly Population in Oldage Homes of Jabalpur City, Madhya Pradesh, India

**Suryakant C. Deogade · S. Vinay · Sonal Naidu**

Received: 30 August 2012 / Accepted: 29 November 2012 / Published online: 9 December 2012


**Abstract** Oral disorders are cumulative throughout life and hence unfavourable outcomes are likely to be greatest among the elderly. A descriptive cross-sectional study was conducted among institutionalized geriatric population in old-age homes of Jabalpur city, Madhya Pradesh, to assess their prosthetic status and prosthetic needs. A cross-sectional survey was conducted in all the four old-age homes of Jabalpur city, Madhya Pradesh state, India. All residents aged 60 years and above formed the study population. The recording of prosthetic status and prosthetic needs was carried out according to the World Health Organisation (WHO) Oral Health Assessment Form (1997). A total of 224 individuals were included in the study of which 123 were females and 101 were males. Seventy five percent of the females and 55 % of the males had no prostheses in their upper arch and 61 % of the females and 76 % of the males had no prostheses in their lower arch. More number of males presented with 'Bridges' in their upper arch when compared to females ($P$ value = 0.006). Highest prosthetic need in males was multi-unit prosthesis (42 % in upper arch and 41 % in lower arch) whereas, females' required full prosthesis (39 % in both the upper arch and lower arches). Ageing presents some formidable challenges, particularly with the institutionalised. This study clearly demonstrates a high insufficiency of prosthetic care among the institutionalized elderly population. Any preparation towards the provision of oral health care should not be limited to treatment alone but, more importantly focus on empowering this elderly community with information and education programmes.

**Keywords** Dental prosthetic status · Prosthetic need · Geriatric home · Edentulous

S. C. Deogade
Department of Prosthodontics, Hitkarini Dental College & Hospital, Jabalpur, India

S. C. Deogade (✉)
Flat No-502, Block-D, Apsara Apartment, South Civil Lines, Pachpedi Road, Jabalpur, MP 482001, India
e-mail: dr_deogade@yahoo.co.in

S. Vinay
Department of Public Health Dentistry, Hitkarini Dental College & Hospital, Jabalpur, India

S. Naidu
Department of Pedodontics and Preventive Dentistry, Modern Dental College and Hospital, Indore, India

## Introduction

Throughout the world, a demographic revolution is underway as the proportion of older people is growing faster than any other age group [1]. Aging is a universal process and a normal inevitable biologic phenomenon. Man, from time immemorial, has tried to increase the life span and enhance his health from various scientific innovations. With discoveries in medical science and improving social conditions, the average life span in most parts of the world continues to increase [2], and it becomes the mission of the health professionals to work not merely to increase the life span but also and perhaps more importantly, make later years of life more productive and enjoyable [3].

Elderly or old-aged consists of individuals with their ages nearing or surpassing the average life span of human beings. Government of India adopted 'National Policy on Older Persons' in January 1999 [4]. The policy defines 'senior citizen' or 'elderly' as a person who is of age 60 years or above. Approximately 600 million people are

aged 60 years and over, and this number will double by 2025 and by the year 2050, there will be 2 billion and 80 % of them living in developing countries [1, 5]. It is predicted that the elderly population of India shall be the highest in the world by 2025 and their contribution to the demographic profile is increasing everyday [2]. According to the 1991 census, the geriatric population constituted 6.3 % of the total Indian population [6].

Simultaneously, the ratio of people of "working age" (15–59 years) to those of elderly population is shrinking and even within the working age group the average age also increasing [7]. For the developing countries like India, the ageing population may pose mounting pressures on various socio economic fronts including pension outlays, health care expenditures, fiscal discipline, and savings levels etc. [4]. In Thailand, the government has taken a number of steps at the national level to direct more resources into supporting older people, including the launch of a National Pension Fund in March 2011 [8]. The hope is that the expansion of the retirement pension among insured workers under the social security system and savers under a planned National Savings Scheme will be enough to counterbalance the likely loss of filial support. Judging by the experience of other countries, such schemes alone may not be sufficient [8].

We all know that, the traditional Indian society and the age-old joint family system has been instrumental in safeguarding the social and economic security of the elderly people in the country. However, with the rapid changes in the social scenario and the emerging prevalence of nuclear family set-ups in India in recent years the elderly people are likely to be exposed to emotional, physical and financial insecurity in the years to come [4]. In many other developing countries, children are by far the most common source of income for the older people, and expectations of filial support in old age are shared widely by the current generation of adults [8].

What is needed is a fundamental rethinking of our attitudes to older people, particularly the notion that older people constitute a "social burden". We would like to see a refocusing on the continuing contribution of older people to society, as part of what World Health Organization (WHO) calls an 'active ageing' approach, one of the key components of which is maintaining good health beyond 60 [8]. In 1995, in response to the global challenges of ageing populations, the WHO launched a programme on ageing and health [2]. It was designed to advance knowledge about health care in elderly through targeted training and research efforts, information dissemination and policy development. The World Health Report 1998 emphasized the need to strengthen health promotion amongst older people [9]. But however active and healthy people can remain after 60, there comes a point where older people start to become frail and lose autonomy. Some kind of care system has to be in place and that system has to be funded.

This explains why these non-communicable diseases (NCDs) are fast becoming the leading causes of disability and mortality [10]. However, experiences from developed countries show that the prevalence of chronic disease and high levels of disability in older people can be reduced through health promotion and appropriate NCDs prevention strategies designed to improve quality of life [11]. Oral disorders are cumulative throughout life and hence unfavourable outcomes are likely to be greatest among the elderly [12]. In the coming decades, dental practitioners will face the challenge of providing dental care for a growing number of elderly who retain more natural teeth [13].

Improved oral health will allow geriatric persons to improve their self-confidence, have active social contacts, and restore the ability to work at home or at the job location. Older people can be a valuable resource; they can contribute to society within their families, communities and national economies as either a formal or an informal part of the workforce or through volunteer work. For example, In Sub-Saharan Africa and many countries of Asia, old-age people played an important role in taking care of children whose parents have died of Acquired immuno deficiency syndrome [14].

According to a recent census the city of Jabalpur, the elderly constitute 35 % of the total population and correspondingly higher number of residents in the old-age homes [15]. Oral health care needs of these elderly living in such care facilities have been found to be significantly greater, but unfortunately these elderly are less able financially to afford it [16]. Also, the oral health status in the general elderly population has been addressed increasingly in the past years, but the oral health of institutionalized elderly and underprivileged populations continue to be a neglected issue [17].

In order to promote the oral health and formulating a plan for an oral health care programme for the institutionalised elderly, we need to know acquire the baseline information regarding their dental prosthetic status and prosthetic needs. As of today, there is no data available for Jabalpur district. Hence, an effort was made to collect this baseline information.

## Materials and Methods

All the four old-age homes of Jabalpur; one under the district administration and the remaining three under the management of Non-Governmental Organisations (NGOs) were included in the study. Approval for the study was obtained from the Institutional Review Board. The aim and

nature of the study was explained to the authorities of these institutions, their approval was obtained, and the dates and the time for the survey was finalised. Subjects had been informed of the nature of the investigation and have been included in the study after they signed a written consent.

This cross-sectional survey was conducted from April–June 2012 to determine the prosthetic status and prosthetic need among the institutionalized elderly residents of old age homes in Jabalpur city, Madhya Pradesh state, India. All inmates aged 60 years and above formed the study population.

A pretested proforma was used for data collection. It recorded the sociodemographic factors and enclosed the prosthetic status and prosthetic needs sections of the WHO Oral Health Assessment Form (1997) [18]. The investigators were trained, standardised and calibrated in recording the proforma on patients attending the Department of Public Health Dentistry, Hitkarini Dental College & Hospital. The armamentarium used included mouth mirrors, CPITN probes in sterile instrument carrying bins, disposable surgical gloves mouth masks and copies of the proforma. Most of the subjects were examined sitting in chairs under natural illumination and the non-ambulatory was examined in their beds. Artificial illumination (torch light) was used where required. The recorder was made to sit close to the examiner so that the codes were heard easily and the examiner could see the findings being recorded correctly. A maximum of 25 patients were examined on each visit.

After the completion of data collection, all the old-age homes were adopted by the Department of Public Health Dentistry, Hitkarini Dental College and Hospital, Jabalpur to cater to their oral health needs. With the permission of caretakers, the residents were brought-in for comprehensive care at the hospital and were followed up every month after their treatment during visits to their homes.

## Statistical Analysis

Data obtained was subjected to the Statistical Package for the Social Sciences (SPSS) Version 15.0 for analysis. Differences in proportions were compared using the Chi squared test. A difference was considered to be of statistical significance if the $P$ value was $<0.05$.

## Results

A total of 224 subjects [123 females (55 %) and 101 males (45 %)] aged 60 years and above with a maximum age of 94 years (mean age 68.78 ± 6.6) formed the study population (Fig. 1).

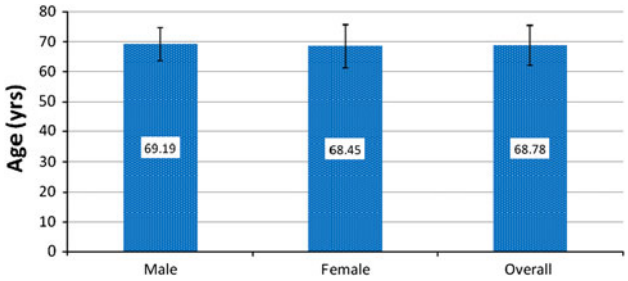


**Fig. 1** Mean age of the study samples

The distribution of study subjects according to gender and the prosthetic status of their upper and lower arches are shown in Table 1. Seventy five percent of the females and 55 % of the males had no prostheses in their upper arch comparatively 61 % of the females and 76 % of the males had no prostheses in their lower arch. More number of males presented with 'Bridges' in their upper arch when compared to females; this showed a significant ($\chi^2$ test $P$ value = 0.006).

The distribution of study subjects according to gender and the prosthetic need of their upper and lower arches are shown in Table 2. Higher number of male subjects required multi-unit prosthesis (42 % in upper arch and 41 % in lower arch) followed by combination of one & multi-unit prosthesis (17 % in upper arch and 16 % in lower arch) when compared to females. Higher number of females' required full prosthesis (39 % in both the upper arch and lower arches) followed by the need for a multiunit prosthesis (14 % in upper arch and 24 % in lower arch) when compared to males. Comparison of gender and the prosthetic need in their upper and lower arches showed significant differences ($\chi^2$ test $P$ value $\leq 0.001$).

Subjects from both the genders with edentulousness (partial or complete) in either of their arches were scored under prosthetic need (Table 3). Eighty two percent of males and 80 % of females showed some or the other form of edentulousness. No statistically significant difference was observed ($\chi^2 = 0.104$; $P = 0.747$).

## Discussion

Dental prosthetic status and prosthetic needs were investigated in elderly, residing in old-age homes, Jabalpur, Madhya Pradesh, India. Of the population aged 60 and above residing were selected and a total of 224 subjects were included in this study. These subjects were examined under standardized conditions and prosthetic status and prosthetic needs were recorded. The findings indicate that the prosthetic status was poor and the treatment needs were extensive.

**Table 1** The distribution of study subjects according to gender and the prosthetic status of their upper and lower arches

| Prosthetic status | Upper arch | | Lower arch | |
|---|---|---|---|---|
| | Male (%) | Female (%) | Male (%) | Female (%) |
| No Prosthesis | 56 (55) | 92 (75) | 62 (61) | 93 (76) |
| Bridge | 11 (11)[a] | 2 (2) | 4 (4) | 2 (2) |
| Partial denture | 9 (9) | 6 (5) | 13 (13) | 9 (7) |
| Both bridge & partial denture | 7 (7) | 4 (3) | 4 (4) | 0 (0) |
| Full mouth denture | 18 (18) | 19 (15) | 18 (18) | 19 (15) |
| Total | 101 (100) | 123 (100) | 101 (100) | 123 (100) |
| $\chi^2$ Test *P* Value | 0.006* | | 0.500 | |

[a] Denotes statistically significant difference ($P < 0.01$) as males have more number of "bridge" in their upper arch as prosthetic status compared to females

**Table 2** The distribution of study subjects according to gender and the prosthetic need of their upper and lower arches

| Prosthetic need | Upper arch | | Lower arch | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| No Prosthesis need | 23 (23) | 46 (37) | 19 (19) | 31 (25) |
| One-unit prosthesis | 7 (7) | 6 (5) | 12 (12) | 9 (7) |
| Multi-unit prosthesis | 42 (42) | 14 (11) | 41 (41) | 24 (20)[a] |
| Combination of one & multi-unit prosthesis | 17 (17) | 9 (7) | 16 (16) | 11 (9) |
| Full prosthesis | 12 (12) | 48 (39) | 13 (13) | 48 (39)[b] |
| Total | 101 (100) | 123 (100) | 101 (100) | 123 (100) |
| $\chi^2$ test *P* value | <0.001[a] | | <0.001[b] | |

[a] Statistically significant difference ($P < 0.001$) was observed in the percentage of males who required multi-unit prosthesis when compared to females

[b] Statistically significant difference ($P < 0.001$) was observed in the percentage of females who required full prosthesis when compared to males

**Table 3** The association between gender and their prosthetic needs

| | Male | | Female | | $\chi^2$ | *P* value |
|---|---|---|---|---|---|---|
| | *n* | % | *n* | % | | |
| Prosthetic need | 83 | 82 % | 99 | 80 % | 0.104 | 0.747 |
| Total | 101 | 100 % | 123 | 100 % | | |

No significant association is observed between gender and prosthetic needs ($P > 0.05$)

In all, over 80 % of the study population were partially edentulous, the majority in both arches. Although 18 % of the edentulous subjects possessed dentures, over 80 % of these subjects needed some form of prosthetic treatment. Similar incidence was reported in yet another district of Madhya Pradesh wherein, 76 % of the subjects were edentulous [19]. Analogous study conducted in Geriatric Homes of Mangalore city reported 88 % edentulous in upper and lower arches [2]. A further review of literature disclosed that yet another study concludes that the prosthetic needs among institutionalized geriatric individuals in Nashik City, Maharashtra is as high as 85 % [20]. This low proportion of subjects with prostheses in spite of the need may be attributed to one of these few reasons like, lack of awareness, lack of interest, lack of interest in aesthetics, financial constraints and the underuse dental facilities. These elucidations are supported in analogous studies conducted [2, 15]. Dependency of the elderly on others to satisfy their needs is held responsible for their higher unmet prosthetic needs. Similar conclusions were drawn in a study which recorded higher unmet prosthetic needs in elders of Ambala city [21].

A significant finding recorded in this study was that higher percentage of males had one or the other form of prostheses when compared to the females. This implies that the prosthetic status of males is better than females. Comparable findings have been recorded in studies conducted both in India [2, 16, 22] and abroad [16, 23, 24]. The rationale behind female subjects presenting fewer prostheses than their counterparts was due to their dependency, a lower level of education and lack of employment. These conclusions are in accordance with the study conducted by Shenoy and Hegde [2].

In the current study, the need for multi-unit prostheses (42 %) was more than the need for combination of one-and/or multi–unit prosthesis (17 %) or full prostheses (12 %) in males. This result was alike to the study by Shenoy and Hegde [2]. Whereas the need for full prostheses (39 %) was more than the need for multi-unit prostheses (20 %) or the need for Combination of one and multi-unit prosthesis (9 %) in females. This result was similar to the result obtained by Slade et al. [24]. The present study denotes statistically significant ($P < 0.001$) number of males requiring multi-unit prosthesis and combination of one and multi-unit prosthesis in both the arches when compared to females. An evidence to support the lower rates of prosthesis need in females may be due to the lower prevalence of edentulousness when compared to males [21].

Higher prosthetic need among these institutionalized elderly may attribute to their old age and the factors associated with old age such as reduced salivary flow rate, quality and quantity, lowered immunity and the reduced ability of the body to repair itself, may aggravate the process of the degradation of the oral tissues [25]. Although aging alone is not responsible for the deterioration of their oral health, several other factors such as multiple chronic diseases, socio-economic factors, lack of dental facilities and psychological factors such as depression and isolation, because of gradual loss of spouse and friends and feeling of being unwanted by family members, leading to negligence of personnel and oral hygiene and health.

## Conclusion

Ageing presents some formidable challenges, particularly with the institutionalised. This study clearly demonstrates a high insufficiency of prosthetic care among the institutionalized elderly population. This data obtained provides us with a baseline reference and exposes the different barriers which exist like, lack of priority for oral health and their dependent status.

Any preparation towards the provision of oral health care should not be limited to treatment alone but, more importantly focus on empowering this elderly community with information and education programmes. This dual strategy will aid in not just controlling oral diseases by improving dental literacy (preventive care) but also change attitudes towards greater utilisation dental services (curative care) [3].

We also need to make sure that long-term and palliative care is accessible for those who need it at the end stages of life. This means keeping people healthy for as long as possible and giving them the opportunity to do the things they want and that society needs.

## References


1. United Nations Population Division. World population prospects: the 2002 revision, New York, 2003. http://www.un.org/esa/population/publications/wpp2002/WPP2002-HIGHLIGHTSrev1.PDF. Accessed on 10/01/2012
2. Shenoy RP, Hegde V (2011) Dental prosthetic status and prosthetic need of the institutionalized elderly living in geriatric homes in mangalore: a pilot study. ISRN Dent 2011:1–3
3. Goel P, Singh K, Kaur A, Verma M (2006) Oral health care for elderly: identifying the needs and feasible strategies for service provision. Indian J Dent Res 17:11–21
4. National policy on older persons.www.socialjustice.nic.in/hindi/pdf/npopcomplete.pdf. Accessed on 12/01/2012
5. World Health Organization (2002) Active ageing: a policy framework. WHO, Geneva
6. Elango S (1998) A study of health and health related social problems in the geriatric population in a rural area of Tamil Nadu. Indian J Public Health 42(1):7–8
7. Situation analysis of the elderly in India (2011) Central statistics office ministry of statistics & programme implementation. Government of India
8. The health-care challenges posed by population ageing. Bull World Health Organ 2012; 90:82–83
9. World Health Organization (1998) The world health report 1998. Life in the 21st century: a vision for all. WHO, Geneva
10. World Health Organization (2003) The world health report 2003. Shaping the future. WHO, Geneva
11. Puska P, Pietenen P, Uusitalo U (2002) Influencing public nutrition for non-communicable disease prevention: from community intervention to national programme: experiences from Finland. Public Health Nutr 5:245–251
12. Aleksejuniene J, Holst D, Eriksen HM (2000) Patterns of dental caries and treatment experience in elderly Lithuanians. Gerodontology 17:77–86
13. Mack F, Mojon P, Budtz-Jψrgensen E, Kocher T, Splieth C, Schwahn C et al (2004) Caries and periodontal disease of the elderly in Pomerania, Germany: results of the study of health in Pomerania. Gerodontology 21:27–36
14. Petersen PE, Yamamoto T (2005) Improving the oral health of older people: the approach of the WHO Global Oral Health Programme. Commun Dent Oral Epidemiol 33:81–92
15. Basic health information, Madhya Pradesh. http://www.mp.gov.in/health/general.htm. Accessed on 27/07/2012
16. Soh G, Chong YH, Ong G (1992) Dental prosthetic status and needs of an elderly population living in long-term care facilities in Singapore. J Commun Health 17(3):175–181
17. Gaiao LR, Almeida ME, Filho JG, Leggat P, Heukelbach J (2009) Poor dental status and oral hygiene practices in institutionalized older people in Northeast Brazil. Int J Dent, Volume, pp 1–6
18. World Health Organization, Oral Health Surveys—Basic Methods, World Health Organization, Geneva, Switzerland, 4th edition, 1997
19. Shrivastav A, Bhambal A, Reddy V, Jain M (2011) Dental prosthetic status and needs of the residents of geriatric homes in Madhya Pradesh, India. J Int Oral Health 3(4)
20. Chaware S, Ghodpage SL, Sinha M, Chauhan V, Thakare V (2011) Prosthetic status and prosthetic needs among institutionalized geriatric individuals in Nashik City, Maharashtra: a descriptive study. J Contemp Dent Pract 12(3):192–195
21. Bansal V, Sogi GM, Veeresha KL (2010) Assessment of oral health status and treatment needs of elders associated with elders' homes of Ambala division, Haryana, India. Indian J Dent Res 21(2):244–247

22. Shah N, Parkash H, Sunderam KR (2004) Edentulousness, denture wear and denture needs of Indian elderly: a community-based study. J Oral Rehabil 31(5):467–476
23. Palmqvist S (1988) Treatment needed and received in an elderly Swedish county population. Gerodontics 4:272–276
24. Slade GD, Spencer AJ, Gorkic E, Andrews G (1993) Oral health status and treatment needs of non-institutionalized persons aged 60+ in Adelaide. South Australia. Aust Dent J 38(5):373–380
25. Navazesh M (2002) Dry mouth: aging and oral health. Compend Contin Educ Dent 23(10 Suppl):41–48