ORIGINAL RESEARCH

The Relationship between Prosthetic Status and the Geriatric Oral Health Assessment Index in a Group of Institutionalized Elderly of an Indian City: A Cross-sectional Study

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ABSTRACT

Aim: To assess and compare the quality of life and oral health status among institutionalized elderly in Pune.

Materials and methods: A cross-sectional, quantitative exploratory study was conducted in persons 60 years of age in an institutionalized elderly home. The GOHAI questionnaire was completed by a single examiner, who interviewed the patients in their local language. The oral examination was carried out according to WHO oral health survey using the DMFT-index, community periodontal index (CPI), periodontal loss of attachment (PLA), prosthetic use, and needs according to criteria established by the WHO by a calibrated examiner. Descriptive analysis was carried out using absolute and relative frequencies of the qualitative variables and means with respective standard deviations for the quantitative variables. The Student's t-test was applied to compare groups.

Results: Out of the total 110 individuals interviewed for the study, 64% were males and 36% were females. Individuals with up to 20 missing teeth and individuals with more than 20 missing teeth were 20 and 80% respectively. Based on the prosthetic need, 66% individuals needed replacement of teeth by dentures in one or both arches while 34% did not need any replacement by complete denture. The mean value for physical dimension was 5.40 whereas for psychosocial dimension, pain/discomfort and behavioral dimension were 8.02, 4.58 and 7.32.

Conclusion: The quality of life was found to be more favorable in individuals with less than 20 teeth missing. The quality of life among complete denture wearers in both the arches was better as compared to the quality of life among nondenture wearers. Prosthetic replacement by complete denture helps the individuals to maintain better oral health.

Clinical significance: The data obtained from the present study may serve as a reference point for comparisons of the magnitude of quality-of-life indicators relating to oral health.

Keywords: GOHAI, Quality of life, Oral health status, Epidemiological survey, Complete dentures.

INTRODUCTION

The elderly represent a special category in the population, not only because of the consequences of specific disease and conditions, but also because they often have restricted access to medical care, including dental care. This group can also experience certain restrictions that modify their life styles and mental status, which may affect their social interactions, thus affecting their quality of life.[1]

Recent times have shown that there has been a drastic increase in the number of elderly individuals. Often, oral health is compromised in the elderly in the form of tooth loss, alveolar bone loss leading to mobility of teeth and periodontal destruction.[2] Oral health is an inevitable part of the general well-being of the individual acting like a mirror for the manifestation of some systemic diseases.

Some systemic health conditions are more prevalent in geriatric age group such as diabetes and hypertension, which affect the oral health condition adversely. Self-perception of oral health is often overlooked and the resulting impact on general health is not taken into consideration.[3] The quality of life of an individual is interdependent on the individual's general well-being and as well as oral health.

To assess the oral health status, knowing the perspective of individuals about their own health is an important prerequisite for increasing adherence to healthy behavior.[4] This is more important and relevant in elderly people as the main reason these individuals do not seek dental treatment is their not recognizing the need for oral healthcare.[5]

A variety of oral health-related quality-of-life instruments have been developed in the past 20 years as a result of increased concern about the impact of oral conditions on a person's quality of life. The most commonly used with the elderly being the Geriatric Oral Health Assessment Index (GOHAI).[6]

Very few studies have been recorded until date regarding self perception or oral health among elderly. The aim of this study was to assess and compare the quality of life, oral health status among institutionalized elderly in Pune.

MATERIALS AND METHODS

This is a cross-sectional, quantitative exploratory study conducted with institutionalized elderly in Pune, Maharashtra. Prior to the start of the study ethical approval was obtained from the Institutional Ethics Committee.

There are five homes for the elderly in the city of Pune, out of which two were randomly selected.

The definition of elderly was based on chronological delimitation; that is persons 60 years of age and over were selected. The patients who fulfilled the following inclusion criteria (a) Subjects free from any systemic disease that affects the oral functions (b) who did not have difficulty in remembering any past history and who were present on the day of examination.

Informed consent was obtained from the subjects. A total of 110 subjects completed the questionnaire and oral examination.

The GOHAI questions refer to three dimensions: the social dimension, encompassing aspects of concern over oral health status, self-image and awareness of health, and limitations of social contacts caused by oral problems; the physical dimension involving aspects related to eating, speaking and swallowing; and the pain or discomfort dimension associated with oral health status.

The GOHAI questionnaire was completed by a single examiner, who interviewed the patients in their local language. The questionnaire consisted of 12 questions comprising of physical dimension (3 questions), pain/discomfort dimension (3 questions) and psychosocial dimensions (4 questions) and behavioral dimension (2 questions). The answers were recorded on a 3-point scale; 1 being always, 2 = sometimes and 3 being never. Thus, a higher sum of these responses indicated to a better quality of life.

The oral examination was carried out according to WHO oral health survey using the DMFT-index, community periodontal index (CPI), periodontal loss of attachment (PLA), prosthetic use, and needs according to criteria established by the WHO.[7] A single trained and calibrated examiner carried out the examination under natural light.

The completed questionnaire was analyzed by entering the data in MS excel and statistical analysis was done using SPSS v.17.0. Descriptive analysis was carried out using absolute and relative frequencies of the qualitative variables and means with respective standard deviations for the quantitative variables. The Student's t-test was used in bivariate analysis to determine the statistical significance between independent variables and outcomes.

RESULTS

Out of the total 110 individuals interviewed for the study, 64% were males and 36% were females (Graph 1).

Around 54% of the subjects were from the age group of 60 to 65 years, 14% individuals were among 66 to 70 age group, 20% were among 71 to 75 age group and 12% individuals were in the age group ranging from >75 (Graph 2).

Based on clinical conditions, the sample was divided into 2 groups: individuals with upto 20 missing teeth and individuals with more than 20 missing teeth with 20% and 80% respectively. Based on the prosthetic status,
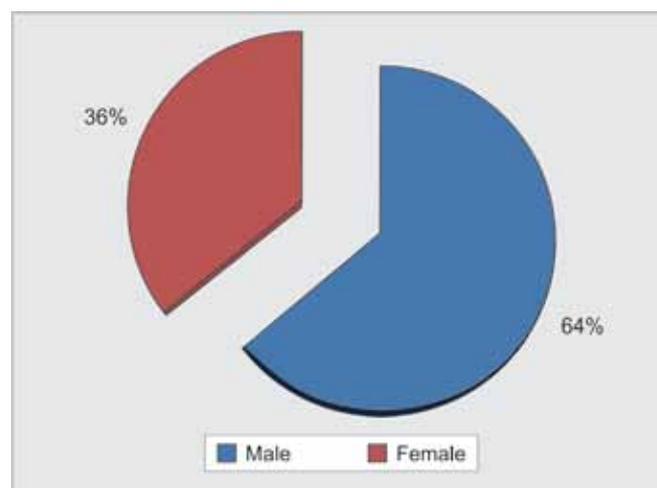
Graph 1: Distribution of the subjects according to gender
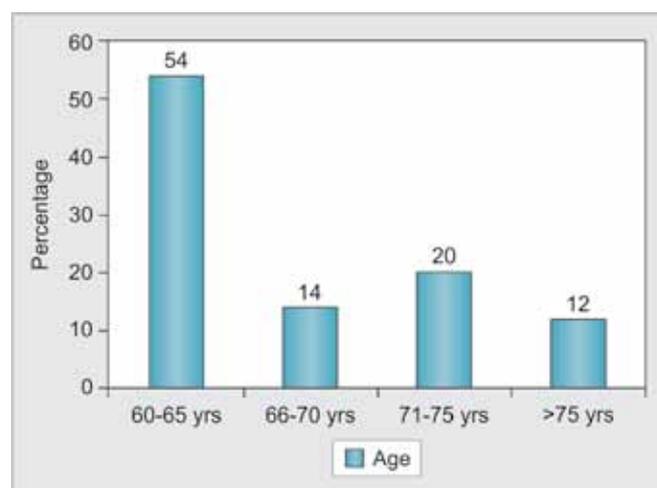
Graph 2: Distribution of subjects according to age group

64% individuals used dentures in either one arch or did not use at all; while 36% used dentures in both the arches. Based on the prosthetic need, 66% individuals needed replacement of teeth by dentures in one or both arches while 34% did not need any replacement by complete denture (Table 1).

According to the Table 2, the mean value for physical dimension was 5.40 whereas for psychosocial dimension, pain/discomfort and behavioral dimension were 8.02, 4.58 and 7.32.

The mean for physical dimension in males was 5.66 and in females was 4.94. The mean for psychosocial dimension among males was 8.09 and among females was 7.89. The mean for pain/discomfort among males was 7.19 and among females was 7.61. The mean for behavioral dimension among males was 4.59 and among females were 4.57 (Table 3).

The mean for physical dimension among the age groups, 61-65; 66-70; 71-75 and >75 was 5.25, 5.43, 5.70 and 5.50 respectively. The mean value for psychosocial dimension amongst the above mentioned age groups was 8.04, 7.57, 8.00 and 8.50 respectively. The mean value for pain or discomfort function was 7.63, 6.71, 7 and 7.17 respectively. The mean value for behavioral dimension is 4.48, 4.57, 4.7 and 4.83 respectively (Table 4).

The mean for physical dimension in individuals with <20 teeth was 5.10 and those with >20 teeth was 5.47. The mean for psychosocial dimension was 8.10 and 8.00 in individuals with <20 missing teeth and >20 missing teeth respectively (Table 5).

The mean value for physical dimension, psychosocial dimension, pain/discomfort function and behavioral dimension in individuals who wear complete denture in one or more arches was 5.21, 8.00, 7.31 and 4.46 respectively and among those who do not wear any complete denture was 5.72, 8.05, 7.33 and 4.77 (Table 6).

The mean value for physical dimension, psychosocial dimension, pain/discomfort function and behavioral dimension in individuals who need complete denture was 5.27, 7.97, 7.39 and 4.45 whereas in individuals who do not need any replacement by complete denture was 5.64, 8.11, 7.19 and 4.82 respectively (Table 7).

DISCUSSION

A cross sectional study conducted among institutionalized elderly patients of randomly selected old-age homes of Pune city. This study was done to assess their quality of life. The main results from this study were the assessment

Table 1: Percentage distribution of subjects according to clinical conditions

Absence of teeth	More than 20 teeth	80%
	Up to 20 teeth	20%
Use of full dentures	Not used/used in one arch	64%
	Used in both arches	36%
Need for full dentures	Needed in one or two arches	66%
	Not needed	34%

Table 2: Mean and standard deviation for GOHAI and its dimensions

	N	Mean	Std deviation
Physical dimension	110	5.4	1.39
Psychosocial dimension	110	8.02	1.16
Behavioral dimension	110	4.58	0.85
Pain discomfort	110	7.32	0.95
GOHAI sum	110	25.32	2.75

Table 3: Mean and standard deviation for GOHAI and its dimensions according to gender

Gender		Physical dimension	Psychosocial dimension	Behavioral dimension	Pain/ discomfort	GOHAI sum
Male	Mean (SD)	5.6 (1.4)	8.0 (1.2)	4.5 (0.9)	7.1 (1.0)	25.5 (3.0)
Female	Mean (SD)	4.9 (1.2)	7.8 (1.1)	4.5 (0.7)	7.6 (0.7)	25 (2.1)
t-test	p-value	0.54	0.10	0.88	0.55	0.08

Table 4: Mean and standard deviation for GOHAI and its dimensions according to age groups

Age-group		Physical dimension	Psychosocial dimension	Behavioral dimension	Pain /discomfort	GOHAI sum
60-65 years	Mean (SD)	5.2 (1.3)	8.0 (0.9)	4.4 (0.8)	7.6 (0.8)	25.4 (2.3)
66-70 years	Mean (SD)	5.4 (1.39)	7.5 (1.1)	4.5 (0.9)	6.7 (1.1)	24.2 (3.1)
71-75 years	Mean (SD)	5.7 (1.8)	8.0 (1.6)	4.7 (0.8)	7.0 (1.1)	25.4 (3.8)
>75 years	Mean (SD)	5.5 (1.0)	8.5 (1.0)	4.8 (0.7)	7.1 (0.4)	26.0 (1.8)

Table 5: Mean and standard deviation for GOHAI and its dimensions according to missing teeth

Missing teeth		Physical dimension	Psychosocial dimension	Behavioral dimension	Pain/ discomfort	GOHAI sum
<20 missing teeth	Mean (SD)	5.1 (0.8)	8.1 (0.9)	4.8 (0.9)	7.1 (0.8)	25.1 (2.3)
>20 missing teeth	Mean (SD)	5.4 (1.5)	8.0 (1.2)	4.5 (0.8)	7.3 (0.9)	25.3 (2.8)
t-test	p-value	0.78	0.42	0.37	0.81	0.45

Table 6: Mean and standard deviation for GOHAI and its dimensions according to prosthetic status

Prosthetic status		Physical dimension	Psychosocial dimension	Behavioral dimension	Pain/ discomfort	GOHAI sum
Use in one arch/ not used	Mean (SD)	5.2 (1.2)	8.0 (1.0)	4.4 (0.9)	7.3 (1.0)	25.0 (2.6)
Used in both arches	Mean(SD)	5.7 (1.6)	8.0 (1.3)	4.7 (0.7)	7.3 (0.7)	25.3 (2.9)
t-test	p-value	0.27	0.94	0.22	0.87	0.22

Table 7: Mean and standard deviation for GOHAI and its dimensions according to prosthetic needs

Prosthetic needs		Physical dimension	Psychosocial dimension	Behavioral dimension	Pain/ discomfort	GOHAI sum
Need for denture in 1 arch or both arches	Mean (SD)	5.2 (1.5)	7.9 (1.2)	4.4 (0.8)	7.3 (1.0)	25.0 (3.0)
No need for complete dentures	Mean(SD)	5.6 (0.9)	8.1 (1.0)	4.8 (0.8)	7.1 (0.8)	25.7 (2.1)
t-test	p-value	0.41	0.45	0.15	0.67	0.35

of oral health by oneself depending upon clinical conditions such as presence or absence of teeth, prosthetic status and prosthetic need. The quality of life was found to be more favorable in individuals with less than 20 teeth missing.[8] This shows that tooth loss is one of the factors for deterioration of oral health among elderly. This finding was in consensus with the study carried out by Ekanayke and Perera (2005).[9] Within the Brazilian context, Hugo et al (2007) showed that elderly people with fewer than 20 teeth assessed their chewing capacity negatively.[10]

The quality of life among complete denture wearers in both the arches was better as compared to the quality of life among nondenture wearers. Prosthetic replacement by complete denture helps the individuals to maintain better oral health.

Oral health was more favorable in individuals who did not need any replacement by complete denture therapy. Nunes and Abegg (2008) have shown in their study that individuals with need of prosthetic replacement by complete denture showed negative impact on their oral health especially their chewing ability.[11]

The GOHAI score can be compared to the GOHAI scores derived from a similar study carried among elderly individuals in South-eastern Brazil[12] But the sample size was too big as compared to this sample size, so direct comparison cannot be made. As any other GOHAI scores are not available to compare, these can be interpreted neither as high nor low.

Measurements of self-perceived oral health are considered to be an essential component of oral health surveys and essential for assessing the results from therapeutic and preventive dental treatments. The data obtained from the present study may provide a basis for future research, thereby serving as a reference point for comparisons of the magnitude of quality-of-life indicators

relating to oral health. The associated factors that were identified may contribute toward planning oral healthcare services, from a broader perspective of health promotion and integration of preventive and rehabilitative actions with educational activities that encourage and guide elderly people regarding the importance of self-care.[7]

LIMITATIONS AND RECOMMENDATIONS

The sample size selected was small, hence definite conclusions cannot be made from this study. Individuals with systemic diseases were not included in the study. Several systemic diseases have direct effect upon the oral cavity deteriorating the oral health and quality of life.

As concluded from the above study, the quality of life is improved in individuals with denture wearers so the individuals considered in this study were provided appropriate prosthetic treatment with a goal of achieving optimum oral health dependent quality of life.

CLINICAL SIGNIFICANCE

The quality of life was found to be more favorable in individuals with less than 20 teeth missing. The quality of life among complete denture wearers in both the arches was better as compared to the quality of life among nondenture wearers. Prosthetic replacement by complete denture helps the individuals to maintain better oral health. The data obtained from the present study may serve as a reference point for comparisons of the magnitude of quality-of-life indicators relating to oral health.

REFERENCES

1. Murariu A, Hanganu C. The relationship between denture-wearing and the geriatric oral health assessment index in a group of institutionalised Romanian 65 to 74 years old. Oral Health Dent Manag 2011 June;10(2):64-69.

2. Ogunbodede EO. Population ageing and the implications for oral health in Africa. Gerodontology 2013 Mar;30(1):1-2.

3. Kleinman DV. The future of the dental profession: perspectives from Oral Health in America: a report of the surgeon general. J Am Coll Dent 2002 Summer;69(3):6-10.

4. Benyamini Y, Leventhal H, Leventhal EA. Self-rated oral health as an independent predictor of self-rated general health, self-esteem and life satisfaction. Soc Sci Med 2004 Sep;59(5): 1109-1116.

5. Lundgren M, Österberg T, Emilson G, Steen B. Oral complaints and utilization of dental services in relation to general health factors in a 88-year-old Swedish population. Gerodontology 1995;12:81-88.

6. Atchison KA, Dolan TA. Development of the geriatric oral health assessment index. J Dent Educ 1990;54(11):680-687.

7. World Health Organization. Oral health surveys: basic methods. 4th ed. Geneva; 1997.

8. Costa EHM, Saintrain MVL, Vieira APGF. Autopercepção da condição de saúde bucal em idosos institucionalizados e não-institucionalizados. CienSaude Coletiva 2010;15(6): 2925-2930.

9. Ekanayake L, Perera I. Factors associated with perceived oral health status in older individuals. Int Dent J. 2005;55(1):31-37.

10. Silva DD, Held RB, Torres SV, Sousa Mda L, Neri AL, Antunes JL. Self-perceived oral health and associated factors among the elderly in Campinas, Southeastern Brazil, 2008-2009. Rev Saude Publica 2011 Dec;45(6):1145-1153.

11. Nunes CI, Abegg C. Factors associated with oral health perception in older Brazilians. Gerodontology 2008;25(1): 42-48.

12. Locker D, Allen F. What do measures of 'oral health related quality of life' measure. Community Dent Oral Epidemiol 2007;35(6):401-411.

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