Assessment of oral health status, treatment needs and oral health related quality of life among institutionalized elders of Bangalore city Karnataka- A cross sectional study

1.Dr. Padma K Bhat, 2. Dr. Jayachandra M Y, 3. Dr. Nayana M,
4. Dr. Akshata J Airsang, 5.Dr. Vinod Rangan
[1]Professor, Department of Public Health Dentistry, Rajarajeswari Dental College and Hospital, Bangalore, Karnataka.
[2]Reader, Department of Public Health Dentistry, Rajarajeswari Dental College and Hospital, Bangalore, Karnataka.
[3]Senior Lecturer, Department of Public Health Dentistry, Dayanand Sagar College of Dental Sciences, Bangalore, Karnataka.
[4]Senior Lecturer, Department of Conservative Dentistry and Endodontics, Dayanand Sagar College of Dental Sciences, Bangalore, Karnataka.
[5]Professor, Department of Oral and Maxillofacial Surgery, Dayanand Sagar College of Dental Sciences, Bangalore, Karnataka.
Corresponding author: Dr. Padma K Bhat, Professor, Department of Public Health Dentistry, Rajarajeswari Dental College and Hospital, Bangalore, Karnataka.

Abstract:

Introduction: Oral health is commonly affected when elderly become care-dependent, it usually becomes worse and gets less attention. WHO Index age group has defined “senior citizen” or “older adults” as people belonging to the age group 65-74 years where sixty-five and older make upto 8.5% of the world’s population Studies assessing oral health in institutionalized elderly use a variety of definitions or descriptions for oral health. The main aim of this study was to assess the oral health related quality of life and oral health status among institutionalized elderly population aged 60 years and above in Bangalore city.

Methodology : The present study was performed to find out the oral health status of the geriatric population and also to describe their oral health related quality of life. 300 individuals, aged 60 years and above from randomly selected old age homes of Bangalore South were included in the study. Geriatric Oral Health Assessment Index (GOHAI) was used to find out the oral health related quality of life and WHO oral health assessment survey basic methods, 2013. SPSS software for windows (version 23.0) was used. The data was statistically analyzed using chi-square test, Independent t test and Kruskal Wallis ANOVA.

Results Among the study subjects, 180 were males and 120 were females with a mean age of 77.43 years for males and 77.48 for females. The mean Add-GOHAI score for the whole population was 28.65. The mean Loss of attachment score was 1.09±0.33. Assessment of prosthetic status showed that 98% of study subjects were not wearing any prosthesis either in mandibular or in maxillary arch. Prosthetic needs are higher among study subjects with 97.3% and required prosthesis in maxillary arch and 91.4% of study subjects required a prosthesis in mandibular arch.

Conclusion Oral health status of the whole population brought to focus the higher periodontal disease levels and the higher decayed, missing teeth status among them.. Particularly important are the implications for the provision of affordable preventive therapy and treatment methods at improving the overall quality of the oral health and life of older people.

Introduction

Ageing is an universal process and a normal inevitable biologic phenomenon. Man, from time immemorial, has tried to increase the life span and enhance 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, 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. [1]

''Quality of life'' was defined by WHO as: ''the condition of life resulting from the combination of the effects of the complete range of factors such as those determining health, happiness (including comfort in the physical environment and a satisfying occupation), education, social and intellectual attainments, freedom of action, justice and freedom of expression''. [2]

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).[3] Geriatric Oral Health Assessment Index (GOHAI), a self-reported measure designed to assess the oral health problems of older adults. [4]

The geriatric oral health assessment index (GOHAI),suggest use of measure to asses the impact of oral condition on quality of life (QoL) of individual. The 12 item GOHAI was developed to evaluate three dimensions of oral health related quality of study (QoL) [6]

In India, the elderly population was 20 million in 1951 and 57 million in 1991followed by a sharp increase in 2001. According to observed growth rates for this period, the growth of the "'65+'" population was more than the total population.It is expected to rise to 100 million in 2013; with a projected population in 2050 of 324 million. [7]

According to the WHO, globally, the prevalence of edentulism among the elderly was 23%. Dental Council conducted National oral health surveys in 65 to 74 year old elderly in urban and rural households in each state in 2002-2003 as per the WHO recommendations. The prevalence of oral diseases were significant with 77% of the elderly population needing treatment for , 81.7% of the population had decayed tooth and the mean number of missing tooth was 19.7. 77% of them had periodontal disease which needed immediate attention. [7,8]

Due to paucity of data on oral health and quality of life and factors affecting the same among institutionalised elderly population in India . The present study was undertaken with the aim to assess the oral health status and its quality of life using Geriatric Oral Health Assessment Index (GHOI) among institutionalised elderly population aged 60 years and above in Bangalore south.

Methodology :

Study source

Institutionalized elderly individuals living in 20 old age homes of Bangalore South were selected for the study.

Study sample design

Community based cross sectional study design

Sample size

Sample size is calculated using the relation n = N/1+Ne2, where confidence interval chosen is 95% i.e., e = 0.05

Total number of elderly residing in various old age homes in Bangalore south is N =1180

Therefore substituting the values in the above mentioned formula the sample size obtained for the study was

n= 1180/1+ (1180 x 0.05 x 0.05)

= 298.7, which is approximately 300.

Inclusion criteria

1) Elderly who are cognitively and physically suitable for examination.
2) Elderly who are willing to participate and who provide informed consent.

Exclusion criteria

1) Elderly with significant cognitive impairment and physically unsuitable for examination.
2) Elderly who are not willing to participate and not giving informed consent.

Pilot study

A pilot study was done among 30 elderly subjects aged 60 years and above, visiting Department of Public Health Dentistry, Rajarajeswari dental college and Hospital, Bengaluru India. A questionnaire was administered to each participant to check the feasibility and relevance of the questionnaire. It also helped for proper planning and execution of the main study. These aged participants were not included in the main study.

Organizing the survey

Ethical clearance was obtained from the Institutional Review Board of Rajarajeswari dental college and hospital Bangalore.

List of old age homes in Bangalore south was collected from the social welfare office. Permission to conduct the study was obtained from the Authorities at each of the old age homes in Bangalore south region . 300 individuals, defined by the inclusion

and exclusion criteria were selected from randomly selected old age homes from a total of 20 old age homes.

The present study was conducted during May 2023 - June 2023. On an average 25-30 subjects were interviewed and examined on each day. Examination of each individual took approximately 8-10mins. The oral examination of all the study subjects was carried out by a single investigator. Elderly participants who were unable to read and write got assistance from their respective old age home managers or caregivers.

Examiner calibration:

Oral examination of all study subjects was carried out by single investigator. The investigator was trained and calibrated for examination. Each patients were meticulously examined and findings were recorded. The recording assistant was also trained for recording proforma .

Instruments Used

The Geriatric Oral Health Assessment Index (Kannada Version) *was* recorded by face-to-face interview by the trained and calibrated recorder. The original Geriatric Oral Health Assessment Index (GOHAI) [4] was developed in USA in 1990 and consists of 12 items assessing three hypothesized dimensions: physical function, psycho-social function and pain and discomfort.

In the present study, the GOHAI was translated from English to Kannada by three bilingual persons whose first language was Kannada and then the index was back-translated from Kannada to English by another set of three bilingual persons whose first language was English. Comparison between the original English and the back-translated version was made by another bilingual person and only minor modifications were performed. The internal consistency of the translated version was assessed by the Cronbach's Alpha value-which was 0.7.

Oral health status of the elderly population will be assessed using WHO assessment form 2013

Statistical Analysis -

SPSS software for windows (version 23.0) was used. Continuous data were presented as mean and standard deviation. Categorical data were presented as frequencies with percentages and were analysed with chi-square test. Two group comaprisions was done using using paired t test . multiple group comparisions were done using kruskal wallis test. The level of significance was set at 0.05.

Results

The study population consisted of 300 elderly staying in different old age homes , out of which 180 were males with a mean age of 77.43 years (SD = 8.22) and 120 were females with a mean age of 77.48 years (SD = 7.94). When mean ages of males and females were compared, a non significant statistical association was found ($p>0.958$). **TABLE 1**

The mean Add-GOHAI score for the whole population was 28.6 (SD = 8.6) and a score range from 13 to 59 . The Add-GOHAI score

was used to divide the whole population into three groups with 97% in the low groups, with score group (<50) having mean Add-GOHAI score of 26.4(SD= 7.2) and 1.7% having mean Add-GOHAI score of 53.9 (SD =1.3) and 1.3% having mean Add-GOHAI score of 58.5 (SD =0.57) in the moderate (51-56) and high score groups (>56) respectively.

Clinical characteristics

Total mean DMFT was high among the elderly population (Mean DMFT 19.68 ± 6.59). Mean DMFT was high among moderate add GOHAI group (21.63± 7.23) when compared with low (19.57± 6.57) and high group (17.77± 2.50). The difference in the mean DMFT score of the three groups was not statistically significant (p>0.597). **TABLE 2**

Majority of the study subjects needed one surface filling (70%). A need for two or more surface filling was noted among 38.7% of study subjects. A need for pulp care therapy was noted among 38.7% of study subjects and the need for dental extraction was noted among 46% of the study subject. The need for dental extraction was higher among low score group (97.8%) as compared to moderate score group (2.2%) and statistically significant difference was noticed between the three groups for the need for dental extraction (p<0.003). **TABLE 3**

A highest score of three, indicating presence of shallow pockets was found in 93.4% of study subjects. Score 2 indicating calculus was found among 0.75% of the study subjects. The total mean CPI score was 2.47 ± 1.12. The prevalence of bleeding and deep pockets was only among the low Add GOHAI score group. The mean CPI scores among three groups i.e. low, moderate and high groups were 2.92 ± 0.39, 3 and 3 respectively. A statistically significant difference was noticed between the three groups for the Community Periodontal Index scores (P <0.00).

The mean Loss of Attachment score among the low, moderate and high group was 1.09 ± 0.34, 1.14 ± 0.36 and 1.00 ± 00 respectively. A highest score of one was found in most of the study subjects, out of which 92.9% reported low Add GOHAI score, 5.4% reported moderate Add GOHAI score and 1.7% reported high Add GOHAI scores. A statistically significant difference was noticed between the three groups for the highest loss of attachment scores (p<0.00).

Prosthetic Status and oral health related quality of life. 92.8% who were not having any prosthesis in mandibular and maxillary arch and 66% of subjects who had full removable denture prosthesis in mandibular and maxillary arch reported low Add GOHAI score. 5.8% who were not having any prosthesis in mandibular and maxillary arch and 33.3% of subjects who had full removable denture in mandibular and maxillary arch reported moderate Add GOHA[I] score. There was a statistically significant difference (p<0.023) in the prosthetic status of the three groups according to oral health-related quality of life. **TABLE 4**

Only 2% of the study subjects had full removable dentures in both mandibular and maxillary arch and 98% of study subjects were not wearing any prosthesis either in mandibular or in maxillary arch 97.3 % of study subjects required a maxillary prosthesis and 91.4 % required

mandibular prosthesis. All subjects among high GOHAI score group required both maxillary prosthesis and mandibular prosthesis. No significant difference was noted for the prosthetic needs among the three groups.

Table 1: Distribution of subjects according to age and gender

Gender	Number (%)	Mean Age	Standard Deviation	T Value	P value
Male	170 (55%)	67.77	7.01	0.052	0.73 NS
Female	130 (45%)	67.48	6.54		

Table 2: Distribution and comparison of subjects according to mean number of Decayed,Filled,Missing, DMF teeth and oral health related quality of life

DMFT	Add – GOHAI SCORES			H	P value and significance
	LOW (<50)	MODERATE (51-56)	HIGH (>56)		
DT	4.97 ± 3.88	4.64± 4.16	5.34 ± 1.25	0.15	0.932
FT	1.51 ± 1.49	1.00 ± 0.00	1.00 ± 1.41	2.950	0.229
MT	12.14 ± 6.57	12.00 ± 7.90	11.50 ± 2.38	6.526	0.038**
DMFT	18.62 ±6.57	17.46 ± 7.23	17.84 ± 2.50	1.033	0.597

** P value < 0.05 significant

Table 3 : Distribution and comparision of subjects according dentition treatment needs and oral health related quality of life

Treatment Needs	Add – GOHAI SCORES LOW (<50)	MODERATE (51-56)	HIGH (>56)	H	P value and significance
One surface filling	200 (95.2%)	10(4.8%)	0 (0%)	12.66	0.002**
Two or more surface filling	103 (88.8%)	10(8.6 %)	3(2.6 %)	4.03	0.139
Pulp care and restoration	104(89.7%)	9(7.7 %)	3(2.6 %)	2.970	0.226
Extraction	136(97.8%)	3(2.6 %)	0(0%)	11.395	0.003**

** P value < 0.05 significant

Table 4: Distribution and comparison of subjects according prosthetic status (Maxilla and mandible)and oral health related quality of life

Prosthetic Status	Add – GOHAI SCORES LOW (<50)	MODERATE (51-56)	HIGH (>56)	X^2	P value and significance
Maxillary no prosthesis	273 (92.8%)	17(5.8%)	04(1.4%)	7.566	0.023**
Maxillary Full removable denture	4 (66.7%)	2(33.3 %)	0 (0 %)		
Mandibula No prosthesis	273 (92.8%)	17(5.8%)	04(1.4%)	7.566	0.023**

Mandibular Full removable denture	4 (66.7%)	2(33.3 %)	0 (0 %)		

Discussion :

Out of 300 subjects examined for the study 60% were males and 40% were females . it was similar to study by Shetty et al in which 64%were males and 36% females . the present study findings were in accordance with studies done by Bansal et al [1] in Hariyana and Syed et al in Pakistan[9] . this may be due to females who prefer to stay with their children engaging in house hold work as compared to males.

The mean DMFT score obtained in the present study was 19.67 which was similar to the study done by Khan et al among the elderly population of Bengaluru city, where the mean DMFT was 22.8.[15] It is also similar to studies done by Sharifa in Saudi Arabia (mean DMFT- 18.6)[10], Srivastava et al in Delhi (mean DMFT- 14.4)[11] and Syed et al in Pakistan (mean DMFT-16.3)[9]. The increased DMFT may be due to limited usage of dental services and difficulties in accessibility and affordability. Most of the subjects used to consult general physicians even for oral problems instead of dentists. The mean DMFT scores were higher among three groups and the difference in the mean DMFT score of the three Add-GOHAI groups was not statistically significant with scores being 19.57 f 6.57, 21.63 ± 7.23 and 17.75 ± 2.50 among low, moderate and high Add - GOHAI score individuals respectively. These findings were similar to those from studies by Raja et al [13], Spanish Geriatric Oral Health Research Group[5]. But these DMFT scores were less when compared to other studies by Khanagar et al [17], James et al [16].

Even if older people can maintain good oral hygiene without periodontal disease or dental caries, they may suffer pulp exposure or some other dental problems. About 38% of the subjects in the present study requires pulp care and restoration and 46% of the subjects need extraction. It is in accordance with the study done by Sharifa in Saudi Arabia, in which 33% of subjects require pulp care and restoration and 48% of them require extraction[10]. The need for dental extraction was high among low Add-GOHAI score group (97.8%). This was in contrast to findings of study by Khanagar et al, where only 45% of the nursing home residents needed dental extraction[17]. More than half of the low GOHAI scorers (95.2%) required one surface filling. These findings showed the high unmet oral health care treatment needs of the study population.

In the present study, about 3.9% subjects were having calculus as highest score, 93.4% of subjects were having shallow pocket (4-5mm) as highest score and 2.7% of the subjects were having deep pocket (6mm or more) as highest score. It was in contrast to study done by BansaI et al in Haryana, wherein about 51% of subjects had calculus as highest score, 26%

had shallow pocket as highest scorer.[1] In a study done by Syed et al[9] in Pakistan, prevalence of calculus was 28%, shallow pocket was 24% and deep pocket was 19%. In a study done by Sharifa [10] in elderly population of Saudi Arabia, prevalence of calculus, shallow pocket and deep pocket were 51 20 and 2 respectively Srivastava reported 41% and 49% prevalence of shallow and deep Pocket respectively among the elderly population of Delhi.[11]

In the present study,there was a high prevalence rate of loss of attachment and severity of periodontal disease, ultimately results in higher levels of tooth loss. A study done among the elderly population by Khan et al [15] reported that the prevalence of loss of attachment between 4 - 5mm and 6-8 mm 12% and 18% respectively, Srivastav[11] reported 41% and 26% prevalence of loss of attachment between 4-5mm and 6-8mm respectively among the elderly population of Delhi. A study done by Prasad et al [12] among the elderly population of Ghaziabad reported that the prevalence of loss of attachment between 4 5mm and 6 -8mm were 26% and 33% respectively among the subjects which were in accordance with our study.

About 2% of subjects in the present study had complete denture in both upper and lower arches. Whereas 98% of the subjects had no prosthesis in upper arch and lower arch. The present study is in accordance with the study done by Syed et al in Pakistan[9] (subjects *having* complete denture- 9% and 80% had no prosthesis). In a study done by Bansal et al in Haryana, about 11% of subjects were found wearing complete denture in both the archesl. A study done in Saudi Arabian elderly people by Sharifa [10]reported that only 5% of the subjects were having complete denture in both the arches. In a study done by Khan et al 13% of the subjects had complete denture in upper arch and 8% of the subjects had complete denture in lower arch.[15]

A small number of subjects in the present study need complete denture in the upper and lower arch (7% and 4%), whereas in study done by Bansal et al in Haryana, 36% of the subjects needed complete dentures in both the arches'. In a study done in Saudi Arabian elderly people by Sharifa [10] 32% needed complete denture in both the arches". A study done by Khan et al among the elderly population of Bengaluru city reported that 35% of the subjects need complete denture in upper arch and 30% of the subjects need complete denture in lower arch[15]

In the present study, the severity of oral disease did not show significant association with oral health-related quality of life which was similar to results of Atchison and Dolan's original study[4]

Conclusion :

In the present study the observations on the dentition treatment needs and the prosthetic needs implied a higher need among the low oral health-related quality of life scorers, the Oral Health Status of the whole population brought to focus the higher periodontal disease levels and the higher decayed, missing teeth status among them. Thus the need of the hour with respect to the elderly population residing in old age homes should be towards more of oral health promotion and answering to the immediate treatment needs, which could have effect in improving their oral health-related quality of life. Further Dantha Bhagya scheme which is provided by Govt of Karnataka to be utilized efficiently. Projects with effective planning and implementation strategies that can help change lifestyle and attitude of inmates and caregivers towards the improvement of oral health of this institutionally bound population should be introduced.Geriatric department in dental hospitals to provide oral health care services with palliative treatment thus promoting quality of life.

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