

Critical Assessment on Unmet Oral Health Needs and Oral Health-related Quality of Life Among Old Age Home Inhabitants in Karnataka, India

Roma M^{1,2}
Madhura Sen^{1,2}
Kundabala Mala^{1,2}
Nanditha Sujir^{2,3}
Dharnappa Poojary^{2,4}
Neetha J Shetty^{2,5}
Ramya Shenoy^{2,6}
Sharon Saldanha^{2,7}

¹Department of Conservative Dentistry and Endodontics, Manipal College of Dental Sciences, Mangalore, Mangalore, India; ²Manipal Academy of Higher Education, Manipal, Karnataka, India; ³Department of Oral Medicine and Radiology, Manipal College of Dental Sciences, Mangalore, Mangalore, India; ⁴Department of Oral & Maxillofacial Surgery, Manipal College of Dental Sciences, Mangalore, Mangalore, India; ⁵Department of Periodontology, Manipal College of Dental Sciences, Mangalore, Mangalore, India; ⁶Department of Public Health Dentistry, Manipal College of Dental Sciences, Mangalore, Mangalore, India; ⁷Department of Prosthodontics and Crown and Bridge, Manipal College of Dental Sciences, Mangalore, Mangalore, India

Correspondence: Ramya Shenoy
Department of Public Health Dentistry,
Manipal College of Dental Sciences,
Mangalore, Light House Hill Road,
Mangalore, Karnataka, 575001, India
Tel +91 9880450277
Email ramya.shenoy@manipal.edu

Sharon Saldanha
Department of Prosthodontics and
Crown and Bridge, Manipal College of
Dental Sciences, Mangalore, Light House
Hill Road, Mangalore, Karnataka, 575001,
India
Email sharon.saldanha@manipal.edu

Purpose: To critically assess the unmet oral health needs and oral health-related quality of life among old age home inhabitants in Karnataka, India.

Methods: A total of 96 older adults (males=32, 33.33%, females=64, 66.67%) aged 60 years and above, residing in old age homes were included in this cross-sectional study. The mean age of the participants included in the study was 69.25±7.99 years. Oral health status and dental needs were assessed using the Oral Hygiene Index Simplified (OHIS) and the WHO Oral Health Assessment forms. Oral health-related quality of life was evaluated by administering the Geriatric Oral Health Assessment Index (GOHAI) questionnaire through an interview format.

Statistical Analysis: The Statistical Package for Social Sciences (SPSS) version 17 was used. Descriptive statistics was tabulated for oral health status and GOHAI scores. Student's *t*-test and ANOVA were applied to check the association of the GOHAI responses with the number of years of residence in old age homes, age groups, gender, and dentition status.

Results: The mean age of the participants included in the study was 69.25±7.99 years. Twenty-six (27.1%) participants reported diabetes mellitus and hypertension. Most of the participants 89 (91.7%) visited the dentist when they had dental complaints. Among the dentulous study population, the majority of the participants had untreated dental caries indicated for dental extraction and needed periodontal therapy. Amongst the participants, 68 (70.82%) required prosthetic rehabilitation. More than 10 years of residence in old aged homes, over 80 years of age, being female, and completely edentulous groups showed lower total GOHAI scores compared to their counterparts.

Conclusion: The majority of the participants showed unmet oral health needs and lower GOHAI scores indicating poor oral health-related quality of life.

Keywords: developing countries, homes for aged, GOHAI, older adults, oral health, oral health-related quality of life

Introduction

The phenomenon of an aging population was first seen in developed countries. However, it is now estimated that two thirds of the world's aging population are in developing countries among which 55% belong to Asia.¹ The aging population in India is increasing exponentially and the national average is projected to increase from the estimated 8% in the year 2010 to 19% in the year 2050.² India consists of around 7.4% of aging population, ie, over 60 years of age, while the life expectancy of the Indian population has increased to 62.36 years for males and 63.39 years for females. This is expected to increase to 19% by 2025. A comprehensive understanding of this change in health care need has become pertinent for effective health-care planning.³ The challenge for health-

care professionals is not only to adequately address the health-care needs of this ageing population, but also to enable them to live a more productive and enjoyable life.⁴ Poor oral health can compromise dietary intake, speech and esthetics that can have social and psychological implications. Management of the oral conditions can be challenging in this age group owing to their systemic health and low motivation.⁵

The old age homes in India are mostly run by charitable trusts that have limited resources to provide adequate oral health care to their inhabitants.⁶ Proper planning regarding oral health promotion programs is required, to prevent and treat oral health problems in older adults. This study was carried out with the aim to critically assess the unmet oral health needs and oral health-related quality of life among inhabitants of old age homes in India.

Materials and Methods

This cross-sectional analytical study was carried out in three old age homes located in Mangalore, Karnataka, India. Out of six old age homes, administrators of three gave permission to carry out the study. Ethics committee approval (protocol reference no. 16119, dated January 23, 2017) was obtained prior to the commencement of this study. Informed consent was taken from each of the participants prior to data collection. Older persons who could not give consent, ie mentally challenged and bedridden were excluded from the study. A total of 96 participants aged 60 years and over were included in the study.

Reliability and Validity of GOHAI

Oral health-related quality of life was assessed by administering Geriatric Oral Health Assessment Index (GOHAI).⁷ The GOHAI has four items related to physical function, three items associated with pain and discomfort, and five items related to psychosocial function. GOHAI scores were calculated using a cumulative method, where the addition of the response set of GOHAI items was done. (always=5, often=4, sometimes=3, seldom=2, never=1). Ten bilingual persons were asked to translate the questionnaire from English to Kannada and retranslate responses to assess the reliability of the GOHAI items (Cronbach's alpha =0.86). Test-retest reliability analysis was carried out on 15 individuals using Pearson's correlation coefficient, whereas internal consistency was measured using Cronbach's alpha. A strong positive correlation (0.81) and high internal consistency (0.89) was reported; no items were deleted/modified at this stage. These responses were not included in the main result.

Data Collection

A detailed case history was documented for every participant. Oral health-related quality of life was evaluated through the GOHAI questionnaire through an interview format. After a preprocedural 5 mL Betadine® (povidone-iodine) mouth rinse⁸ a thorough oral health checkup was done for every participant. A single experienced examiner, performed the clinical oral examinations with the participant seated in an ordinary dental chair under adequate illumination, using sterile mouth mirror, CPI (Community Periodontal Index) probe, tweezers and cotton rolls. The OHIS (Oral Hygiene Index Simplified)⁹ and WHO Oral Health Assessment forms¹⁰ were used to assess the oral hygiene status, the dentition status and periodontal status of older adults.

Statistical analysis was done using the Statistical Package for Social Sciences (SPSS), version 17 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were tabulated for oral health status and GOHAI scores. Student's *t*-test and ANOVA were applied to check the association of the total GOHAI responses with number of years of residence in old age homes, age groups, gender, and dentition status.

Results

A total of 96 older adults (males=32, 33.33%), females=64, 66.67%) aged 60 years and over residing in old age homes were included in this cross-sectional study. The mean age of the participants included in the study was 69.25±7.99 years. While considering the educational qualification of the participants, most of the participants, ie 45 participants (46.9%) attended primary school and 31 (32.3%) were illiterate. About 26 (27.1%) of the participants reported diabetes mellitus and hypertension. The majority of the participants, 89 (91.7%) visited the dentist only when they had dental complaints and five (5.2%) had never visited a dentist. About 54 participants (51.84%) used a toothbrush and toothpaste for maintenance of oral hygiene and 22 participants (22.9%) used their fingers to clean their teeth. Seventy-four participants (71.04%) maintained their oral hygiene by brushing only once a day, preferably in the morning while, 18 participants (18.8%) maintained their oral hygiene by brushing in the morning and night. Twenty-four participants (25%) did not change their toothbrush at regular intervals. Ninety-two participants (96.9%) did not use any other oral hygiene aids like mouthwash and salt water gargling.

On TMJ evaluation, 84 (88.5%) of the participants reported no TMJ problems. None of the participants reported any mucosal changes on examination. In the present study around

71 (74%) participants were dentulous and partially edentulous. Among these 37 (52.11%) participants had good oral hygiene and 13 (18.3%) had poor oral hygiene (Table 1). The majority of the participants had untreated dental caries indicated for dental extraction. Out of 71 participants the number of decayed teeth seen was 380 out of which 130 needed one surface treatment, 76 required two or more surface treatments, 60 teeth needed pulp care, and 112 teeth were indicated for extraction. The detailed statistics regarding dentition status and treatment need were depicted in Table 2. CPI revealed more than half of the participants showed a score above code 2 and loss of attachment code 1, which indicated the need for

periodontal therapy (Table 3). About 28 (15.62%) participants did not have prosthetic need, 68 (70.82%) of the participants needed prosthetic rehabilitation, out of which 17 (17.70%) needed complete denture treatment. (Table 4).

In this study, we have evaluated the oral health-care needs and impact on oral health-related quality of life among older adults, based on the duration of stay in old age homes, gender, age group, and dentition status of the patient.

Responses to the GOHAI Items

The total GOHAI scores of the participants ranged from 12 to 57 (20.10 ± 9.44), the mean GOHAI score was 14.12 ($SD=9.44$) indicating poor oral health-related quality of life (Table 5). Across all the domains, almost one half of the participants limit the kind or amounts of food they eat, had trouble biting and chewing any kind of food, preventing them from speaking, feeling nervous or self-conscious because of problems with the teeth, gums or denture.

Table 6 summarizes total GOHAI item responses of older adults based on number of years of residence, age group, gender, and dentition status. The distribution of the

Table 1 Oral Hygiene Status of Dentate Older Adults as per OHIS

Status	No. of Older Persons
Good oral hygiene	37 (52.11%)
Fair oral hygiene	17 (23.94%)
Poor oral hygiene	13 (18.32%)
Not recorded	4 (5.63%)

Table 2 Dentition Status and Treatment Need Codes for Each Tooth of Dentate Older Adults

Dentition Status Code	Number of Teeth	Number of Dentate Older Adults	Treatment Need Code	Number of Teeth	Number of Dentate Older Adults
Decayed	380	60 (84.51%)	One surface filling	130	45 (63.38%)
Filled with decay	7	5 (7.04%)	Two or more surface filling	76	25 (35.21%)
Filled with no decay	23	18 (25.35%)	Crown	2	2 (2.81%)
Missing due to caries	1258	70 (98.59%)	Veneer	–	–
Missing due to other reason	154	43 (60.56%)	Pulp care	60	35 (49.29%)
Bridge abutment	1	1 (1.40%)	Extraction	112	32 (45.07%)
Trauma	24	14 (19.71%)			

Table 3 Periodontal Status of Dentate Older Adults

CPI Scores	Number of Dentate Older Adults
Healthy (code 0)	4 (5.6%)
Bleeding on probing (code 1)	4 (5.6%)
Calculus (code 2)	37 (52.1%)
Pocket 4–5 mm black band on probe partially visible (code 3)	8 (11.3%)
Pocket 6 mm or more black band on probe not visible (code 4)	1 (1.4%)
Not recorded	17 (23.9%)
LOA scores	
0–3 mm (code 0)	8 (11.26%)
4–5 mm CEJ within black band (code 1)	25 (35.21%)
6–8 mm CEJ between upper limit of black band and 8.5 mm ring (code 2)	9 (12.67%)
9–11 mm CEJ between 8.5 mm and 11.5 mm rings (code 3)	12 (11.5%)
Not recorded	19 (28.16%)

Table 4 Prosthetic Need of Older Adults

Prosthetic Need	Number of Older Adults
No prosthesis needed	28 (29.17%)
Need for one-unit prosthesis	6 (6.25%)
Need for multi-unit prosthesis	39 (40.62%)
Need for a combination of one- and/multi-unit prosthesis	6 (6.25%)
Need for full prosthesis	17 (17.70%)

total score did not show any statistical significance to these variables. To note, more than 10 years of residence in old age homes, over 80 years of age, being female, and completely edentulous groups showed lower total GOHAI scores compared to their counterparts.

Discussion

Ninety-six participants from three old age homes were included in this study. In this current study 88 participants

(91%) had visited the dentist when they had dental complaints and 50 participants (52.11%) maintained their oral hygiene by brushing at least once a day.^{3,10} In our study 12 participants (12.5%), had TMJ problems but in the study carried out by Mojabi et al⁶ it was 23.2%. Participants of our study had no oral mucosal lesions on examination compared to the study conducted by Mojabi et al,⁶ which reported 67.8% had the mucosal lesions. Ornstein et al reported 52.8% of their participants had mucosal lesions.⁴

From this population, 71 (73.96%) participants were dentulous or partially edentulous and 25 participants (26.04%) were completely edentulous. Thirty-seven participants (52.11%) had good oral hygiene, assessed using the OHIS. This finding was not in accordance with the studies done by Hoeksema et al¹¹ and by Kulkarni.³ A total of 70 participants (98.59%) of the study population had teeth missing due to caries. This has already been documented in a review by Ornstein et al⁴ that described a similar trend

Table 5 Breakdown of Responses to GOHAI Items of Older Adults

	Items	Never	Seldom	Sometimes	Often	Always
Physical function	(1) How often did you limit the kinds or amounts of food you eat because of problems with your teeth or dentures?	50 (52.1%)	18 (18.8%)	15 (15.6%)	5 (5.2%)	8 (8.3%)
	(2) How often did you have trouble biting or chewing any kinds of food, such as firm meat or apples?	48 (50%)	15 (15.6%)	11 (11.5%)	10 (10.4%)	12 (12.5%)
	(3) How often were you able to swallow comfortably?	67 (69.8%)	8 (8.3%)	8 (8.3%)	3 (3.1%)	10 (10.4%)
	(4) How often have your teeth or dentures prevented you from speaking the way you wanted?	63 (65.6%)	14 (14.6%)	8 (8.3%)	2 (2.1%)	9 (9.4%)
Pain/discomfort	(5) How often were you able to eat anything without feeling discomfort?	62 (64.6%)	17 (17.7%)	9 (9.4%)	4 (4.2%)	4 (4.2%)
	(6) How often did you use medication to relieve pain or discomfort from around your mouth?	59 (61.5%)	16 (16.7%)	6 (6.3%)	2 (2.1%)	13 (13.5%)
	(7) How often were your teeth or gums sensitive to hot, cold, or sweets?	66 (68.8%)	19 (19.8%)	7 (7.3%)	1 (1.0%)	3 (3.1%)
Psychosocial Function	(8) How often did you limit contact with people because of the condition of your teeth and gums, or dentures?	67 (69.8%)	21 (21.9%)	4 (4.2%)	–	4 (4.2%)
	(9) How often were you pleased or happy with the looks of your teeth and gums, or dentures?	72 (75%)	12 (12.5%)	7 (7.3%)	–	5 (5.2%)
	(10) How often were you worried or concerned about problems with your teeth, gums, or dentures?	72 (75%)	13 (13.5%)	5 (5.2%)	2 (2.1%)	4 (4.2%)
	(11) How often did you feel nervous or self-conscious because of problems with your teeth, gums, or dentures?	75 (78.1%)	13 (13.5%)	4 (4.2%)	1 (1%)	3 (3.1%)
	(12) How often did you feel uncomfortable eating in front of people because of problems with your teeth or dentures?	71 (74%)	16 (16.7%)	3 (3.1%)	2 (2.1%)	4 (4.2%)

Table 6 Distribution of Total GOHAI Item Responses of Older Adults Based on Age Group, Gender and Dentition Status

		Total Score			P-value
		Minimum	Maximum	Mean \pm SD	
Number of years of residence in old age homes	>5 years	12.00	52.00	22.55 \pm 11.23	0.225
	5–10 years	12.00	57.00	19.32 \pm 8.62	
	<10 years	12.00	40.00	18.06 \pm 7.94	
Age group	60–70	12.00	46.00	20.83 \pm 8.87	0.846
	71–80	12.00	57.00	20.65 \pm 11.98	
	>80	12.00	36.00	18.76 \pm 7.32	
Gender	M	12.00	36.00	20.48 \pm 10.40	0.561
	F	12.00	57.00	19.26 \pm 6.96	
Dentition status	Dentulous and partially edentulous	12.00	52.00	21.24 \pm 11.28	0.561
	Completely edentulous	12.00	57.00	19.70 \pm 8.76	

among patients who showed a high prevalence of tooth loss due to caries.¹¹ A total of 60 participants (84.50%) of the study population had decayed teeth, which is consistent with a study by Kulkarni and Ornstein et al.^{3,4}

In our study the majority of our participants had CPI code 2, but as per the statistics by Peterson et al,¹ the majority of the Indian population showed CPI code 3. According to the results of the present study, 68 participants (70.8%) of the older adults needed periodontal therapy. This information is in strong correlation with the literature review.^{12,13}

In the present study 68 participants (70.8%) required prosthetic rehabilitation of their teeth compared to Dable et al¹⁴ who reported 50% of the participants required dental prosthesis in their study. The total GOHAI scores of the participants in our study ranged from 12 to 57 (20.10 \pm 9.44), the mean GOHAI score was 14.12 (SD=9.44) compared to Ornstein et al who reported scores ranging from 14 to 60 with mean 44.12 and SD \pm 10.16. In our study, over 80 years of age, being female, and completely edentulous groups showed lower total GOHAI scores compared to their counterparts with no statistical significance. As per Ornstein et al,⁴ gender wise and dentition status wise no statistical difference was reported, but age wise the group showed statistical difference.

The present study calls for strategies to improve the oral health of older adults residing in old age homes to achieve the highest oral health-related quality of life.

Conclusion

From the assessed data of studied sample population of the aged, the following conclusions were drawn.

- Majority of the participants had untreated dental caries indicated for dental extraction, required periodontal therapy, and prosthodontic rehabilitation.
- More than 10 years of residence in old age homes, over 80 years of age, being female, and completely edentulous groups showed lower total GOHAI scores compared to their counterparts.
- Majority of the participants showed unmet oral health needs and lower GOHAI scores indicating lower oral health-related quality of life.

Compliance with Ethical Standards

This study was conducted in accordance with the Declaration of Helsinki.

Ethical Approval

The ethical clearance was obtained from Institutional Ethics Committee with the IEC number: 16119.

Informed Consent

Informed consent was obtained from all the individual participants included in the study.

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Disclosure

The authors report no conflicts of interest in this work.

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