Original Article

Assessment of the Impact of Oral Diseases on Oral Health-related Quality of Life among Institutionalized Elderly using Oral Health Impact Profile-14: A Cross-sectional Study

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ABSTRACT

Introduction: India is in a state of demographic transition with a geriatric population of about 80 million, which constitutes 7.2% of the total population. Poor oral health exerts a negative impact on the quality of life of geriatric population. Hence, the present study was conducted for the assessment of the impact of oral disease on daily activities and quality of life among the institutionalized elderly in Bareilly city. **Materials and Methods:** For the present study, a total of 100 patients were purposively selected from two old age homes through convenience sampling technique. Basic oral health survey form (1997) was used to assess the oral health status of the subjects and oral health-related quality of life using short version of oral health impact profile (OHIP-14). Statistical analysis was done using SPSS, 16. Independent *t*-test and ANOVA test were done to determine the relationship between the groups. **Results:** Independent t-test revealed that the presence or absence of grossly decayed teeth, chronic periodontitis, based on edentulism, and remaining sound teeth status produced no significant differences in any of the domains. Females experienced greater impact of oral diseases than males in mean OHIP-14 score; however, it was non-significant ($P = 0.45$). **Conclusion:** Oral health status of the institutionalized elderly in Bareilly city is poor, with edentulism and periodontitis. The impact of oral diseases on the lives of the elderly is relatively low and is non-significant.

Key words: Elderly, Oral health impact profile-14, Oral health-related quality of life, Impact of oral diseases

INTRODUCTION

The elderly are characterized by unique conditions as a result of physiological changes characteristic of aging, as well as diseases and psychosocial and dietary factors that influence their nutritional status.[1]

In general, the elderly are at increased risk of malnutrition due to insufficient food intake (amount),[2] poor selection of food (quality), illnesses that may lead to nutrient loss, and also decrease nutrition absorption, also in elder people, the nutrition deficiency can be a cause of physiological, psychological, pathological, and social factors.[3,4] This situation is aggravated when institutionalized, the occurrence of nutritional disorders in institutionalized elderly ranging from 30% to 80%, with a consequent negative impact on their health.[5]

"Oral health is an essential element for general health and quality of life throughout an individual's life course," as written in a WHO report from 2006 about oral health in the elderly. Good oral health is a state of being free from oral diseases, infections, and pain that restrict normal function and quality of life. The world's population is aging. Society will face a challenge in treating oral and general diseases in older individuals as to provide an appropriate treatment, diagnosis of the disease at an early stage is required. According to Razak *et al.*, few factors such as illness and health-related factors, sociodemographic factors, service-related factors, and subjective factors are required for utilization of dental services.[6]

Due to remarkable increase in the geriatric population, the world is now facing a demographic revolution. According to 2011 census, according to Population Census 2011, there are nearly 104 million elderly persons (aged 60 years or above) in India; according to census, it is expected that by 2050, India's population of the elderly may increase to 323 million.[7]

With increasing age, the problems related to health also increase. Oral health is an integral part of general health. Poor oral health consisting dental problems such as dental caries, periodontal diseases, mobile tooth, missing tooth, and many more lead to compromised general health.[8] Because if one cannot eat properly

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their body suffers. Similarly, the different systemic problems also may have adverse effects on oral health. Poor oral health negatively affects the quality of life.

Also lately, the number of the elderly receiving institutional care has increased tremendously, such residents often have to depend on caregivers for their general and oral health care. Adequate access to dental care can affect there oral hygiene, oral health function that may led to compromised overall health and also can affect the quality of life.[9]

Surveys suggest limited utilization of dental services by geriatric population. This may be because of numerous considerable factors. Age-related compromised mobility is the main factor for limited use of oral health-care facility. Along with that financial dependence, physical dependence and physical health are other contributing barriers. The elderly living alone, who are financially deprived or abandoned from their houses look for alternative homes for living and some choose old age homes.[10] As per the National Oral Health Survey (2004), poor oral health among the elderly has resulted in a high level of tooth loss (29.3%), dental caries status (84.7%), periodontal disease (79.4%), mucosal lesions (10%), and oral cancer (0.5%).[11]

Such elderly do not have facilities for oral health care. This is partly due to the fact that we do not have much records regarding the oral disease burden and treatment needs of the elderly in India. In addition, the extent to which oral diseases affects the general health and quality of life of the elderly has not been extensively studied.

The aim of the study is to describe the oral health-related quality of life (OHRQoL), including the impact of oral diseases, in elderly people. Objective is to assess the impact that oral diseases have on their daily activities and quality of life.

MATERIALS AND METHODS

A cross-sectional study was conducted to assess the impact of oral diseases on daily activities and quality of life using basic oral health survey (1997) and short version of oral health impact profile (OHIP-14) among the institutionalized elderly in Bareilly. The study population comprised institutionalized elderly residing in old age homes in Bareilly.

For the present study, the residents of two old age homes aged 60 years or more and who gave the written informed consent were included in the study. Inmates with cognitive impairment and with severely debilitated and hearing and/or speech impairment were excluded. This list was arrived at, after short listing through convenience sampling technique. A total of 100 patients were purposively selected.

A self-administered questionnaire was given to the inmates' who participated in the study. The information collected by the questionnaire included:

1. OHRQoL using short version of OHIP-14.[12]
2. Oral health status of subjects using basic oral health survey form (1997).[13]

The OHIP-14 includes 14 questions, was prepared by Slade in 1997. The objective of the OHIP is to present certain types of numerical data for different situations in terms of health and treatment consequences. It covers seven dimensions. The subjects covered are the following: Functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. Each of the seven subscales has two questions graded on a 5-point Likert scale .Basic oral health survey was used to assess the oral health status of the subjects. The tool was translated to the local language Hindi by a panel of linguistic experts. The Hindi tool was then translated back in English to find out any errors and corrections were done and a final Hindi questionnaire was then constructed. The study protocol was reviewed and approved by Ethical board, IDS College, Bareilly.

The data were collected from the personal interview, by filling in the specially designed questionnaire. The interview included assessment of the impact of oral diseases on the daily living and quality of life of the participants using the sociodental indicator OHIP. The investigator introduced her to all subjects and appraised them about the study. The respondents were briefed about the study for respondents who had doubts, oral instructions were given to them and those who gave the consent were enrolled in the study.

The clinical examinations were conducted in a well-illuminated area at the old age homes using mouth mirror and CPI probe. The investigator was subjected to prior training and calibration in recording the basic oral health survey pro forma. The investigator was calibrated and intraexaminer reliability was calculated as $\kappa \geq 0.8$.

Along with the oral health, the general health of the participants was also reviewed by the general physician. The medical records of the inmates were also examined to obtain information regarding the major systemic conditions that affected them and the treatment provided. The questionnaire required 25–30 min to be completed by each subject.

Statistical analysis was done using computer with the aid of the Statistical Package for the Social Sciences (SPSS), version 16, USA. In the present study, descriptive statistics were used to summarize the variables. Percentage was to describe the discontinuous variables. ANOVA test was done to determine the relationship between the groups.

RESULTS

In the present study, out of total six old age home, two were selected. A total 100 old people were examined aged between 71 and 80 years. From total population, 66 were men and 34 were women. The mean according to the domain functional limitation for male is 3.14 and for female it is 1.03 (t value −0.658). In physical pain, the mean value of male is 3.19, in female, it is 2.95 (t value 0.852). According to the physical discomfort, the mean value of male is 3.19 and female 1.03 (t value −0.852). In domain physical disability, the mean value for male is 3.24 and for female 3.05 (t value .787). According to the physiological disability, the mean value for male is 3.30 and for female is 3.16 (t value −0.502).

In domain social disability, the mean value for male is 3.30 and for female 3.16 (*t* value 0.502). According to the handicap, the mean value for male is 3.30 and for female is 3.16 (t value −0.494). No statistical significance ($P > 0.05$) was observed between the domains [Table 1].

Table 1: Gender-wise comparison of OHIP-14 scores and its domains

Domain	Gender	*n*	Mean	SD	Mean diff	*t* value	*P* value*
Functional limitation	Male	66	3.14	1.00	0.19	0.658	0.514
	Female	34	2.95	1.03			
Physical pain	Male	66	3.19	1.00	0.24	0.852	0.398
	Female	34	2.95	1.03			
Physical discomfort	Male	66	3.19	1.00	0.24	0.852	0.398
	Female	34	2.95	1.03			
Physical disability	Male	66	3.24	0.89	0.19	0.787	0.435
	Female	34	3.05	78			
Psychological disability	Male	66	3.30	97	0.14	0.502	0.618
	Female	34	3.16	1.01			
Social disability	Male	66	3.30	0.97	0.14	0.502	0.618
	Female	34	3.16	1.01			
Handicap	Male	66	3.30	0.97	0.14	0.494	0.624
	Female	34	3.16	1.01			
OHIP-14	Male	66	22.65	6.22	1.28	0.759	0.451
	Female	34	21.37	5.46			

*$P < 0.05$, *t*-test was used as these variables confer to equality of variance assumption. OHIP-14: Oral health impact profile

Table 2: Comparison of OHIP-14 score and its domains based on periodontal status

Domain	Gender	*n*	Mean	SD	Mean diff.	*t* value	*P* value
Functional limitation	Present	59	3.0303	1.01504	−0.10013	−0.363	0.718
	Absent	41	3.1304	1.01374			
Physical pain	Present	59	3.0303	1.01504	−0.18709	−0.683	0.497
	Absent	41	3.2174	0.99802			
Physical discomfort	Present	59	3.0303	1.01504	−0.18709	−0.683	0.497
	Absent	41	3.2174	0.99802			
Physical disability	Present	59	3.0606	0.89928	−0.28722	−1.243	0.219
	Absent	41	3.3478	0.77511			
OHIP-14	Present	59	21.4242	6.29499	-1.92358	−1.193	0.238
	Absent	41	23.3478	5.36494			

OHIP-14: Oral health impact profile

In Table 2, Functional limitation was seen in 59 subjects with mean value of 3.03 +- 1.01 which was not found to be statistically significant at p value 0.718. Other tables domains such as physical pain, physical discomfort, physical disability was also not found to be statistically significant.

Table 3 shows that the impact of edentulism was more on functional limitation, physical pain, physical discomfort, social disability, and handicap (2.91±1.04) domain of OHIP-14.

In Table 4, when we see the age-wise comparison of OHIP-14, then the impact of all the domains was seen highest on people aged more than 80 years.

Mann–Whitney *U*-test was performed to find the domain-wise differences between and within groups according to the number of remaining sound teeth and it was found that having <12 sound teeth created a significant impact on the physical disability domain (3.38±0.87).

*Mann–Whitney *U*-test was used as these variables did not confer to equality of variance assumption and it was found that having <12 sound teeth created a significant and equal impact on psychological disability, social disability, and handicap domain (3.54±0.88) [Table 5].

Similarly, in Table 6, *t*-test and Mann–Whitney *U*-test were performed to find the comparison of domain of OHIP-14 and its domains based on decayed teeth and it was found that having <10 sound teeth created a significant and equal functional limitation, physical pain physical discomfort, and physical disability domain (3.1628±0.99834).

And having more than 10 sound teeth created significant effect on psychological disability, social disability, and handicap domain.

In the total study population, maximum people diagnosed with shallow pockets (42.8%) followed by people having calculus (19.6%) and deep pockets (16%).

On recording the DMFT index, it was found that maximum number of study subjects had sound teeth (9.12±4.12), followed by missing teeth (5.96±2.68), filled teeth (3.30±1.06), and decayed teeth (3.39±0.77).

On recording the DMFT index, it was found that maximum number of study subjects had sound teeth (9.12±4.12), followed by missing teeth (5.96±2.68), filled teeth (3.30±1.06), and decayed teeth (3.39±0.77). [Table 7]

Table 7: Descriptive statistics – DMFT.

Domain	Chronic periodontitis	*n*	Mean	Std. deviation	Mean diff.	*z* value	*P* value*
Psychological disability	Present	59	3.0909	1.01130	−0.38735	1.460	0.140
	Absent	41	3.4783	0.89796	−0.38735		
Social disability	Present	59	3.0909	1.01130	−0.38735	1.460	0.140
	Absent	41	3.4783	0.89796	−0.38735		
Handicap	Present	59	3.0909	1.01130	−0.38735	1.460	0.140
	Absent	41	3.4783	0.89796	−0.38735		

*$P < 0.05$, Mann–Whitney *U*-test was used as these variables did not confer to equality of variance assumption

Table 3: Comparison of OHIP-14 and its domain based on edentulism status

Domain	Edentulism	*n*	Mean	Std. deviation	Mean diff.	*t* value	*P* value
Functional limitation	Present	20	2.91	1.04	−0.20	−0.593	0.555
	Absent	80	3.11	1.01			
Physical pain	Present	20	2.91	1.04	−0.25	−0.727	0.470
	Absent	80	3.16	1.00			
Physical discomfort	Present	20	2.91	1.04	−0.25	−0.727	0.470
	Absent	80	3.16	1.00			
Physical disability	Present	20	2.91	0.94	−0.34	−1.170	0.247
	Absent	80	3.24	0.83			
Psychological disability	Present	20	2.91	1.04	−0.42	−1.299	0.199
	Absent	80	3.33	0.95			
Social disability	Present	20	2.91	1.04	−0.42	−1.299	0.199
	Absent	80	3.33	.95			
Handicap	Present	20	2.91	1.04	−0.42	−1.299	0.199
	Absent	80	3.33	0.95			
OHIP-14	Present	20	20.36	6.61	−2.30	−1.153	0.254
	Absent	80	22.67	5.78			

OHIP-14: Oral health impact profile

Table 4: Age-wise comparison of OHIP-14 score and its domains

Domain	Age	*n*	Mean	SD	F	Sig.
Functional limitation	<70 years	41	2.78	1.00	1.770	0.180
	71–80 years	41	3.22	1.00		
	>80 years	18	3.40	0.97		
Physical pain	<70 years	41	2.78	1.00	2.161	0.125
	71–80 years	41	3.30	0.97		
	>80 years	18	3.40	0.97		
Physical discomfort	<70 years	41	2.78	1.00	2.161	0.125
	71–80 years	41	3.30	0.97		
	>80 years	18	3.40	0.97		
Physical disability	<70 years	41	2.96	0.88	1.378	0.261
	71–80 years	41	3.30	0.88		
	>80 years	18	3.40	0.70		
Psychological disability	<70 years	41	3.13	1.01	0.318	0.729
	71–80 years	41	3.30	0.97		
	>80 years	18	3.40	0.97		
Social disability	<70 years	41	3.13	1.01	0.318	0.729
	71–80 years	41	3.30	0.97		
	>80 years	18	3.40	0.97		
Handicap	<70 years	41	3.13	1.01	0.318	0.729
	71–80 years	41	3.30	0.97		
	>80 years	18	3.40	0.97		
OHIP-14	<70 years	41	20.70	6.15	1.341	.270
	71–80 years	41	23.04	6.07		
	>80 years	18	23.80	4.89		

OHIP-14: Oral health impact profile

	n	Minimum	Maximum	Mean	Std. deviation
Decayed	100	2.00	4.00	3.3929	0.77878
Missing	100	2.00	12.00	5.9643	2.68981
Filled	100	2.00	5.00	3.3036	1.06035

DISCUSSION

Institutionalized elderly are found to have poorer oral health status than active elderly. Edentulism was calculated as the most significant problem among institutionalized elderly respondents in our study and has also been reported previously. These results are in accordance with the study conducted by Sujatha *et al*.[14] and Zhu and Hollis.[15]

Although the prevalence of edentulism reported in this study (19.6%) is similar to the prevalence of edentulism among the elderly in India according to the WHO Oral Health Data Bank (19%), other study done by Sonkesariya *et al*., the prevalence of edentulism was 20.3%.[17]

Females experienced greater impact of oral diseases than males in all the domains of OHIP-14 and this is corroborating with the findings from a previous study conducted.[9,17]

In the present study, edentulous patients were excluded, leaving 80 only of the sample to be assessed. With periodontal pocket, 16% of these were deep, 42.8% were shallow, and dental calculus was present in 19.6% of the valid sextants. Bleeding on probing was found for 12.5% of the applicable sextants, and areas of health were represented by only 5.3% [Table 5]. Another study conducted by Agrawal *et al*. in 2015, total 599 elderly residing in old age homes were examined, the results showed, deep pocket 23.1%, shallow pocket 52.1%, and dental calculus was

Table 5: Comparison of OHIP-14 and its domains based on remaining sound teeth

Domain	Sound teeth	*n*	Mean	Std. deviation	Mean diff.	*t* value	*P* value
Functional limitation	<12 teeth	77	3.02	1.01	−0.21	−0.648	0.520
	>12 teeth	23	3.23	1.01			
Physical pain	<12 teeth	77	3.07	1.01	−0.16	−0.504	0.617
	>12 teeth	23	3.23	1.01			
Physical discomfort	<12 teeth	77	3.07	1.01	−0.16	−0.504	0.617
	>12 teeth	23	3.23	1.01			
Physical disability	<12 teeth	77	3.12	0.85	−0.27	−0.991	0.326
	>12 teeth	23	3.38	0.87			
OHIP-14	<12 teeth	77	21.77	5.92	-1.92	-1.021	0.312
	>12 teeth	23	23.69	6.09			
**t*-test was used as these variables confer to equality of variance assumption							
Domain	Sound teeth	*n*	Mean	Std. deviation	Mean diff.	*z* value	*P* value
Psychological disability	<12 teeth	77	3.16	1.00	−0.37567	1.220	0.220
	>12 teeth	23	3.54	0.88			
Social disability	<12 teeth	77	3.16	1.00	−0.37567	1.220	0.220
	>12 teeth	23	3.54	0.88			
Handicap	<12 teeth	77	3.16	1.00	−0.37567	1.220	0.220
	>12 teeth	23	3.54	0.88			

OHIP-14: Oral health impact profile

Table 6: Comparison of OHIP-14 and its domains based on decayed teeth

Domain	Sound teeth	*n*	Mean	Std. deviation	Mean diff	*t* value	*P* value
Functional limitation	<10 teeth	23	2.7692	1.01274	−1.242	0.220	−0.39356
	>10 teeth	76	3.1628	0.99834			
Physical pain	<10 teeth	23	2.9231	1.03775	−0.752	0.455	−0.23971
	>10 teeth	76	3.1628	0.99834			
Physical discomfort	<10 teeth	23	2.9231	1.03775	−0.752	0.455	−0.23971
	>10 teeth	76	3.1628	0.99834			
Physical disability	<10 teeth	23	3.2308	0.83205	0.249	0.804	0.06798
	>10 teeth	76	3.1628	0.87097			
OHIP-14	<10 teeth	23	22.4615	5.69525	0.169	0.866	0.32200
	>10 teeth	76	22.1395	6.09676			
**t*-test was used as these variables confer to equality of variance assumption							
Domain	Sound teeth	*n*	Mean	Std. deviation	Mean diff.	*z* value	*P* value
Psychological disability	<10 teeth	23	3.5385	0.87706	1.220	1.220	.220
	>10 teeth	76	3.1628	0.99834			
Social disability	<10 teeth	23	3.5385	0.87706	1.220	1.220	.220
	>10 teeth	76	3.1628	0.99834			
Handicap	<10 teeth	23	3.5385	0.87706	1.220	1.220	.220
	>10 teeth	76	3.1628	0.99834			

*Mann–Whitney *U*-test was used as these variables did not confer to equality of variance assumption. OHIP-14: Oral health impact profile

present in 24.5% of the valid sextants. Bleeding on probing was found for 0.26% of the applicable sextants, and healthy condition was represented by none.[18] Another study conducted by Sha *et al*. among 320 elderly of Andhra Pradesh, shows deep pockets present in 66.2% of study subjects, whereas only 0.3% of subjects were reported to show no signs of periodontal pockets.[19]

Table 7: Percentage of subjects with healthy periodontal tissue, percentage of subjects with bleeding only, percentage of subjects with calculus, percentage of subjects with shallow pockets (4–5 mm), percentage of subjects with deep pockets

S. No.	Codes	*n*	%
1	0=HEALTHY	3	5.3
2	1=BLEEDING	7	12.5
3	2=CALCULUS	11	19.6
4	3=SHALLOW POCKETS	24	42.8
5	4=DEEP POCKETS	9	16
6	X/9=NOT RECORDED	2	3.5

CONCLUSION

Oral health status of the institutionalized elderly in Bareilly city is poor, with edentulism and periodontitis. According to the OHIP-14, in edentulism, all the p values are non-significant. Moreover, in periodontitis, the p values of the following domains – functional limitation, physical pain, physical disability, and physical discomfort not found to be statistically significant.

LIMITATIONS

Majority of the participants shows a negative impact of the oral health on their quality of life but statistical significance could not be established which could be attributed to small sample size. Hence, further longitudinal study on large sample size of a large geographic region is advocated so as to assess the impact of oral diseases on OHRQoL of institutionalized elderly people and is wider implication on masses.

REFERENCES

1. Amarya S, Singh K, Sabharwal M. Changes during aging and their association with malnutrition. J Clin Gerontol Geriatr 2015;6:78-84.
2. Leslie W, Hankey C. Aging, nutritional status and health. Healthcare 2015;3:648-58.
3. Hickson M. Malnutrition and ageing. Postgrad Med J 2005;82:2-8.
4. Evans C. Malnutrition in the elderly: A multifactorial failure to thrive. Perm J 2005;9:38-41.
5. de Lima CB, Moraes FL, Souza LA. Nutritional status and associated factors in institutionalized elderly. J Nutr Disorders Ther 2012;2:116.
6. Razak PA, Richard KM, Thankachan RP, Hafiz KA, Kumar KN, Sameer KM. Geriatric oral health: A review article. J Int Oral Health 2014;6:110-6.
7. Rajan SI, Misra US, Sharma PS. India's Elderly: Burden or Challenge? New Delhi: SAGE; 1999.
8. Griffin SO, Jones JA, Brunson D, Griffin PM, Bailey WD. Burden of oral disease among older adults and implications for public health priorities. Am J Public Health 2012;102:411-8.
9. Shaheen SS, Kulkarni S, Doshi D, Reddy S, Reddy P. Oral health status and treatment need among institutionalized elderly in India. Indian J Dent Res 2015;26:493-9.
10. Bharti R, Chandra A, Tikku AP, Arya D, Gupta R. Oral care needs, barriers and challenges among elderly in India. J Indian Prosthodont Soc 2015;15:17-22.
11. Dental Council of India, Ministry of Health and Family Welfare, Government of India. National Oral Health Survey and Flouride Mapping, 2002-2003. New Delhi: Dental Council of India, Ministry of Health and Family Welfare, Government of India; 2004.
12. Slade GD. Derivation and validation of a short-form oral health impact profile. Community Dent Oral Epidemiol 1997;25:284-90.
13. World Health Organization. Oral Health Surveys: Basic Methods-PAHO. 4th ed. Geneva: World Health Organization; 1998.
14. Sujatha BK, Gomez MS, Mathew NS, Suresh J. Oral health problems among geriatric population and its implication on general health: A cross-sectional survey. J Dent Res Rev 2017;4:13-6.
15. Zhu Y, Hollis JH. Tooth loss and its association with dietary intake and diet quality in American adults. J Dent 2014;42:1428-35.
16. Goel P, Singh K, Kaur A, Verma M. Oral healthcare for elderly: Identifying the needs and feasible strategies for service provision. Indian J Dent Res 2006;17:11-21.
17. Sonkesariya S, Jain D, Shakya P, Agrawal R, Prasad SV. Prevalece of dentulism, partial edentulism and complete edentulism in rural and urban population of Malwa region of India: A population-based study. Int J Prostodont Restor Dent 2014;4:112-9.
18. Agrawal R, Gautam NR, Kumar PM, Kadhiresan R, Saxena V, Jain S. Assessment of dental caries and periodontal disease status among elderly residing in old age homes of Madhya Pradesh. J Int Oral Health 2015;7:57-64.
19. Sha SK, Khan A, Eswara K, Suvarna DL, Kannaiyan K, Pottem N. Assessment of periodontal health and necessity of dental treatment in the institutionalized elderly population of East Godavari district, Andhra Pradesh. J Pharm Bioallied Sci 2019;11:S188-93.