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Original Article

Evaluation of Oral Health Status and Factors Affecting it in the Elderly

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ABSTRACT

Oral and dental problems affect chewing, swallowing, and speech, disrupting daily life activities, problems with facial and dental aesthetics, disorders in communication, and reducing participation in communities and self-confidence. Therefore, the present study aimed to evaluate oral and dental health and the factors affecting it in the elderly. The present study is a cross-sectional descriptive-analytic study. The research population consisted of 216 elderly people who were included in the study using a stratified random sampling method. A demographic information questionnaire and a questionnaire for assessing the dental and oral health of the elderly (Geriatric Oral Health Assessment Index (GOHAI)) were used to collect information. In addition, the last dental visit, the need for dental treatment, the number of times the mouth is rinsed, and the personal assessment of the individual's oral and dental health status were among the items that were recorded and collected in the form of elderly dental information. After completing the questionnaires, the information was entered into SPSS version 23 and analyzed. In the current study, the mean (SD) score of the elderly oral health questionnaire was 49.51 (8.67), and a statistically significant relationship was found between this variable and the number of times of mouthwash and personal assessment of oral health ($P < 0.05$). Oral health in the elderly did not show a different status according to educational level, place of residence, gender, employment status, income, smoking, and last dental visit ($P > 0.05$). The findings of the study showed that the oral health status of the elderly in the study population was relatively low, which could be due to the lack of regular oral hygiene and the unfavorable status that the individual has regarding their oral health assessment.

Keywords: Dental, Oral health, Elderly, Dental problems

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Introduction

Oral diseases are the most common preventable disease in the world, affecting more than 3.5 billion people worldwide. On the other hand, the biggest demographic change in 2021 is the aging of the population. In 2004, the number of people over 60 years of age in the world was approximately 600 million, and this figure is estimated to double to two billion by 2050, with 80% of these people living in developing countries. In 2000, the proportion of elderly people in the total population of the world was 10%. This proportion increased to 13.5% in 2020 [1-3].

Elderly people usually suffer from multiple oral diseases and take multiple medications daily, which will increase and complicate their oral diseases. If left untreated, severe dental caries destroys the tooth crown, progression of periodontal disease, tooth loss, and associated local and systemic problems. All of

these things affect the quality of life of these people [1, 4, 5].

Every person, especially the elderly, has the right to a good quality of life. According to the World Health Organization, quality of life refers to the enjoyment of life opportunities and is mainly referred to as the physical, social, and emotional dimensions of an individual after treatment. Oral health-related quality of life is also one of the main components of quality of life, which refers to the multidimensional assessment of oral and dental function on an individual's sense of health. Problems such as tooth decay, pain, and edentulism can affect the taste of food, chewing, and speaking. These can reduce chewing efficiency by 15 to 16% [6-9]. Untreated oral diseases can increase the risk of cardiovascular disease and diabetes. Poor oral hygiene can increase the risk of these diseases by 20%. A meta-analysis of 26 countries from 2000 to 2017 showed that oral health-related quality of life in the elderly is not adequate [10]. The World Health Organization has recommended epidemiological surveys to collect information on oral health at different ages [11-14]. Various studies have reported contradictory effects of factors affecting oral health-related quality of life, such as gender, income, education, smoking, etc. [10, 15, 16]. This study aimed to investigate the status of oral health and the factors affecting it in the elderly.

Materials and Methods

The present study was a descriptive-analytic cross-sectional study in which the population studied included 216 elderly people over 60 years of age. 128 (59.3%) were women and 88 (40.7%) were men. Individuals were selected using cluster random sampling. Considering a 95% confidence level and a 90% test power, a sample size of 194 individuals was calculated, and considering a 10% dropout rate, this number of 216 individuals was considered. After determining the number of samples, considering that all elderly people have a case file, a list of the elderly's household numbers was prepared, and the required sample size was extracted from the relevant list using cluster random sampling. All questionnaire information was obtained and recorded by visiting the door of the house. Face-to-face interviews were used to complete the questionnaire for elderly people who did not have sufficient literacy. The inclusion criteria for the study were individuals over 60 years of age. The exclusion criteria were individuals who did not wish to participate in the study or had cognitive impairment.

To comply with ethical principles, they were assured of the confidentiality of information and the willingness to withdraw from the study at any time. The data collection tool in this study included the Oral Health Assessment Index (GOHAI), which was first designed by Atchison and Dolan in North America in 1990 and was examined in the elderly population. The construct validity of the tool was also determined by factor analysis and its reliability by Cronbach's alpha [17]. This self-report tool consists of 12 questions with three domains: physical functioning (eating, speaking, and swallowing), psychosocial functioning (concern about oral health, dissatisfaction with appearance, self-consciousness about oral health, and avoidance of social interaction due to oral problems), and pain or discomfort (discomfort and pain and use of medication to relieve oral pain or discomfort). Each question in this tool is rated on a 5-point Likert scale from 1 (always) to 5 (never). The total score of this tool ranged from 12 to 60 points, with a higher score indicating a more favorable oral health-related quality of life. A total score between 12 and 36 indicates poor quality of life, between 36 and 48 indicates moderate quality of life, and between 48 and 60 indicates good quality of life [18].

In addition to collecting demographic information such as gender, smoking, place of residence, marital status, education and income, presence of hypertension and diabetes, need for dental treatment, last dental visit, number of times of mouthwash, and personal assessment of the individual's oral and dental health status, questions were also asked. After completing the questionnaire, the data were entered into SPSS version 23 software, and after analysis, data were described and analyzed through frequency distribution tables and central and dispersion indices and Kolmogorov-Smirnov test for normality of the data, one-way analysis of variance (ANOVA), and t-test.

Results and Discussion

In the current study, a total of 216 elderly people participated, of whom 128 (59.3%) were women and 88 (40.7%) were men. The mean age of elderly men in this study was 67.05 ± 6.41 and the mean age of women was 66.97 ± 6.19. Demographic information and health behaviors of elderly people and their significant scores are shown separately in **Tables 1** and **2**, respectively.

Table 1. Oral health-related quality of life score of the elderly according to demographic information

Variable	Ranking	Frequency	Percentage	Mean and standard deviation of oral health-related quality of life score	Test statistics	P-value
Gender	Male	88	40.7	50.13 ± 8.13	0.89	0.38
	Female	128	59.3	49.08 ± 9.03		
Residence	City	132	61.1	49.03 ± 8.65	1.01	0.31
	Village	84	38.9	50.26 ± 8.72		
Marital status	Single	1	0.5	59	0.79	0.46
	Married	158	73.1	49.69 ± 8.16		
	Widow	57	26.4	48.86 ± 9.06		
Education level	Illiterate	98	45.4	48.77 ± 8.37	2.51	0.43
	Elementary	84	38.9	50.60 ± 8.21		
	High School	15	6.9	46.27 ± 10.12		
	Diploma	14	6.5	53.71 ± 7.39		
	University	5	2.3	43.6 ± 15.06		
Employment status	Unemployed	35	16.2	48.96 ± 8.68	0.65	0.63
	Worker	22	10.2	51.55 ± 6.67		
	Employee	5	2.3	48.20 ± 10.57		
	Freelance	17	7.9	51.06 ± 8.11		
	Housewife	98	45.4	49.66 ± 8.33		
	Other	39	18.1	47.97 ± 10.51		
Income level	Low	132	61.1	48.86 ± 8.80	2.48	0.08
	Medium	73	33.8	51.16 ± 8.13		
	Good	11	5.1	46.36 ± 9.58		
Type of current illness	Free from disease	78	36.1	50.65 ± 8.42	4.56	0.004
	Diabetes	19	8.8	47.26 ± 8.9		
	Blood pressure	72	33.3	51.17 ± 7.69		
	Both	47	21.8	45.97 ± 9.45		

Table 2. Information on health behaviors of the elderly

Variable	Ranking	Frequency	Percentage	Mean and standard deviation of oral health-related quality of life score	Test statistics	P-value
Last dental visit	Less than 1 year	26	12	50.53 ± 9.8	2.1	0.1
	Between 1 and 2 years	41	19	47.73 ± 8.37		
	Between 3 and 5 years	49	22.7	51.84 ± 6.45		
	More than 5 years	100	46.3	48.83 ± 9.28		
Number of times mouthwash	0	5	2.3	39.2 ± 14.18	2.6	0.02
	1	105	48.6	48.39 ± 8.76		
	2	53	24.5	51.49 ± 7.6		
	3	45	20.8	50.66 ± 8.58		
	4	4	1.9	49.75 ± 5.36		
	5	4	1.9	52.25 ± 6.02		
Need for dental treatment	Yes	94	43.5	48.23 ± 9.15	3.72	0.02
	No	69	31.9	51.81 ± 8.24		
	I don't know	53	24.5	48.77 ± 8.77		
Self-assessment of oral condition	Poor	49	22.7	43.29 ± 10.17	16.64	< 0.001
	Average	76	35.2	48.51 ± 7.23		
	Good	79	36.6	52.98 ± 65.3		
	Very Good	10	4.6	58.1 ± 3.14		
	Excellent	2	0.9	60		
Individual dental condition	He has lost all his teeth and does not have dentures	17	7.9	48.47 ± 8.9	0.49	0.62
	He has lost all his teeth and has dentures	59	27.3	49.66 ± 8.8		
	Has more than 20 teeth	53	24.5	52 ± 8.43	2.64	< 0.001
	Has fewer than 20 teeth	87	40.3	48.09 ± 8.48		

Smoking	Yes	17	7.9	50.18 ± 7.28	0.33	0.74
	No	199	29.1	49.45 ± 8.8		

After ensuring normality by the Kolmogorov-Smirnov test, the difference in scores according to gender, smoking, and place of residence, which were two-way, was examined using an independent t-test, and in the remaining cases, a one-way ANOVA test was used. In the present study, the mean total score of the oral health-related quality of life of elderly people (GOHAI) in the participating elderly was 49.51 ± 8.67. The scores of the remaining areas are shown separately in **Table 3**.

Table 3. Total scores and different dimensions of the questionnaire (GOHAT) in the elderly

Variable	Lowest Score	Highest Score	Mean ± Standard Deviation
Total score	26	60	49.51 ± 8.67
Physical dimension	12	30	24.91 ± 4.63
Psychological dimension	6	20	16.38 ± 3.53
Pain and discomfort dimension	3	10	8.21 ± 1.77

The scores by dimensions and questions of the questionnaire are shown in **Table 4**.

Table 4. Scores by dimensions **o**f the questionnaire (GOHAI) in the elderly

Phrases	Always (1)	Often (2)	Occasionally (3)	Rarely (4)	Never (5)
Have you restricted the types of foods you eat? (Physical)	9 (4.2%)	35 (16.2%)	38 (17.6%)	68 (31.5%)	66 (30.6%)
Have you had trouble chewing or biting your food? (Physical)	3 (1.4%)	33 (15.3%)	41 (19.0%)	57 (26.4%)	82 (38.0%)
Have you had difficulty swallowing food comfortably? (Physical)	1 (0.5%)	13 (6.0%)	23 (10.6%)	60 (27.8%)	119 (55.1%)
Have you been unable to speak as you would like? (Physical)	4 (1.9%)	7 (3.2%)	19 (8.8%)	56 (25.9%)	130 (60.2%)
Have you had difficulty eating? (Psychosocial)	2 (0.9%)	13 (6.0%)	32 (14.8%)	53 (24.5%)	116 (53.7%)
Have you had to reduce your interactions with others? (Physical)	0 (0.0%)	6 (2.8%)	14 (6.5%)	44 (20.4%)	152 (70.4%)
Are you unhappy looking at your teeth? (Physical)	9 (4.2%)	18 (8.3%)	26 (12.0%)	53 (24.5%)	110 (50.9%)
Have you taken medication to relieve pain? (Pain and discomfort)	5 (2.3%)	20 (9.3%)	37 (17.1%)	45 (20.8%)	109 (50.5%)
Have you been worried about your teeth or gums? (Psychosocial)	10 (4.6%)	24 (11.1%)	38 (17.6%)	50 (23.1%)	94 (43.5%)
Have you been overly concerned about your gums or teeth? (Psychosocial)	12 (5.6%)	19 (8.8%)	28 (13.0%)	76 (35.2%)	81 (37.5%)
Have you felt uncomfortable eating in front of others? (Psychosocial)	0 (0.0%)	15 (6.9%)	16 (7.4%)	64 (29.6%)	121 (56.0%)
Have your teeth or gums been sensitive to hot, cold, or sweet things? (Pain and discomfort)	2 (0.9%)	13 (6.0%)	40 (18.5%)	60 (27.8%)	101 (46.8%)

In the current study, the oral health-related quality of life score of the elderly was obtained according to the good classification. Which is in the good category but slightly higher than the average. On the other hand, the relationship of this score with gender, smoking, marriage, employment status, income, last dental visit, edentulousness, and no dentures was not related, but it was significantly related to the type of disease (diabetes and hypertension together), the number of times of brushing and the need for dental treatment, and personal assessment of the oral condition and number of teeth.

In a study conducted in China in 2016 to investigate the oral health-related quality of life of the elderly with a similar tool to ours in 744 people, the quality of life score was 48.23 ± 7.62, which is close to our study and relatively good. After entering the effective factors in the linear regression model and matching the age of the individuals, women had a weaker score than men. On the other hand, edentulous individuals had a significantly better quality of life score, as in our study,

although this difference was not significant in our study [19]. In a population-based study in Brazil, a different instrument for oral health-related quality of life (14 questions) was used, but ultimately the association of this score with smoking and denture use was significantly positive (contrary to our study), while, like our study, this score was not significantly associated with gender, education level, and marital status [20].

In a study in India, a poor score was reported, and in this study, similar to our study, this score was associated with gender and, unlike our study, was not associated with the individual's dental status [21]. In a study in Pakistan, where the oral health status of the elderly was assessed with a questionnaire similar to our study, a poor score was reported, which was lower than our study [22]. In a descriptive study conducted in Italy to investigate oral health and oral health-related quality of life in elderly residents of nursing homes, the instrument of this study was similar to our study, and one-third of the participants had a score less than 50 which was undesirable. In this study, similar to ours, a significant positive correlation was found between people who rated their oral health as good and the quality score obtained from the GOHAI questionnaire [23].

In a study in Nepal, the oral health-related quality of life of these people was obtained as 42.6 ± 29.93 using a similar tool that was validated and reliable in that country, which was lower than our study, which did not indicate a favorable situation [24]. In a cross-sectional study that aimed to investigate oral health using a similar tool to our study in 2019 in the elderly living in urban and rural Brazil, the quality of life score of the elderly in rural areas was significantly lower, which was inconsistent with our study, which further identifies the role of sociocultural factors in oral health. However, it is worth noting that the number of people in this study was 81, which was less than in our study [25].

In our study, people who had both diabetes and hypertension had significantly lower quality of life scores than people who were not sick or had only hypertension or diabetes. In Brazil, a population-based study was conducted in which the quality of life-related to oral health was examined in diabetics. In this study, the association of this score with dry mouth, edentulism, and periodontal disease was significant, and this association was independent of socioeconomic status; while in the study, the quality of life score of diabetics did not differ from that of healthy individuals, although in our study, clinical examination was not performed. On the other hand, in this study, the quality of life-related to oral health was not associated with gender, income, education, number of dental visits, and frequency of tooth brushing, which was consistent with our study except for the frequency of tooth brushing. The reason for the difference in the frequency of tooth brushing with the quality of life score may be because, in the Brazilian study, the number of people who did not brush their teeth was very small compared to our study [26].

Conclusion

The present study aimed to evaluate oral and dental health and the factors affecting it in the elderly. In the current study, the mean (SD) score of the elderly oral health questionnaire was 49.51 (8.67), and a statistically significant relationship was found between this variable and the number of times of mouthwash and personal assessment of oral health. Oral health in the elderly did not show a different status according to educational level, place of residence, gender, employment status, income, smoking, and last dental visit. The findings of the study showed that the oral health status of the elderly in the study population was relatively low, which could be due to the lack of regular oral hygiene and the unfavorable status that the individual has regarding their oral health assessment. These results can provide decision-makers and policymakers in this field with useful information for evidence-based planning to improve the oral health of the elderly.

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