Oral and Dental Status, Oral Health-Related Quality of Life and Associated Factors among Institutionalized Elderly in Southeast Iran- A Cross Sectional Study

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Abstract

Introduction: The incidence of oral and dental lesions increases with age, which can negatively affect the quality of life. The aim of this study was to evaluate the oral and dental status, oral health-related quality of life (OHRQoL), and the associated factors in a population of institutionalized elderly in Southeast Iran. **Methods:** This cross-sectional study was conducted on 90 institutionalized elderly who were 60 years old or older. Oral examinations were carried out using mirror and probe under proper light. In addition to recording oral lesions, the dental status of the elderly was determined according to the WHO's criteria. The geriatric oral health assessment index (GOHAI) questionnaire was used to determine OHRQoL. Factors such as age, gender, education, smoking, systemic disease, and the use of denture were recorded for each participant. Data were analyzed by appropriate statistical tests using SPSS software. **Results:** Forty three percent of the participants had oral conditions. Fissured tongue was the most common oral lesion. The prevalence of oral lesions in females was more than twice that of males (P<0.001). The mean DMFT was 25.6±7.3, and no relationship was found between DMFT and age, gender, education, smoking or systemic diseases (P>0.05). The mean GOHAI in the elderly was 42.8±9.7. Smoking and the presence of oral lesions significantly decreased OHRQoL (P<0.05). **Conclusion:** The oral and dental status and consequently OHRQol of the elderly were relatively poor. The need for planning to promote the oral and dental health care aiming at improving the quality of life should be emphasized in this region.

Introduction

Aging is an inevitable process that causes irreversible destructive biological changes in tissues and reduces their functional capabilities (1). According to the world health organization (WHO), individuals older than 60 years are considered elderly (2). The global ratio of the elderly people to other age groups is rapidly growing so that the population of people older than 60 years is estimated to reach 1.2 billion by the year 2025 (3). The elderly individuals are at risk of chronic diseases of oral cavity, such as dental caries, periodontal disease, tooth loss, and benign or malignant oral lesions (4). Various oral lesions can occur in the oral cavity of the elderly and the most common lesions are fissured tongue, atrophic glossitis, sublingual varicosities, and dry mouth (5). The DMFT level in the elderly has been reported between 11.3 and 29.7 in different studies (6-9).

Oral diseases can cause pain and difficulty in speaking, chewing, swallowing, and keeping a balanced diet and can lead to facial and beauty changes (4). Therefore, oral health is a factor that can affect the quality of life of the elderly and their social life (10). Several multi-dimensional tools are available for measuring the subjective effects of oral health on quality of life. Two of

these tools are more widely used for the elderly are oral health impact profile (OHIP) and geriatric oral health assessment index (GOHAI) (11). Although OHIP and GOHAI are very similar, high dental health needs and poor oral health are more easily and efficiently identified through GOHAI (12).

Various factors such as age, gender, socioeconomic status, oral habits such as smoking and tobacco use, systemic diseases, taking medicines, malnutrition, trauma, and using prosthesis have been proposed as the factors affecting oral lesions, dental status, and oral health-related quality of life (OHRQoL) only in the elderly (13-17). It has been also found that the institutionalized elderly have more oral and dental lesions compared to the non-institutionalized ones (18).

The prevalence of oral lesion, dental status, and the OHRQoL have been reported differently in different geographical areas (5, 14, 17, 19, 20). In study of Mozafari et al., prevalence of oral lesions was 98% and fissured tongue was the most common lesion in the institutionalized elderly of Mashhad, Iran (5). In a Brazilian study of elderly population, the prevalence of oral lesions found to be 21.5% and reactive / traumatic lesions were the most common manifestations and the mean DMFT was 29.4 (8). Another study in Mexico reported 17.2 and 45.8 for DMFT and GOHAI in an elderly population, respectively; whereas Zenthofer et al. reported DMFT of 50.5 for GOHAI in study of institutionalized elderly in Germany (19, 20). The prevalence of oral diseases is an important parameter in assessing the oral health of elderly individuals, which can prepare the ground for preventive dental care plans. This study aimed to investigate the relationship of oral and dental status and quality of life with health status and socio-demographic factors in institutionalized individualized in Zabol, Iran.

Materials and Methods

This cross-sectional study was conducted on the elderly people living in welfare centers in Zabol, Sistan and Baluchestan Province, Iran. Zabol is the only city in Sistan and Baluchestan Province (the largest province in Southeast Iran) with elderly welfare centers. There are two welfare centers for elderly (a center for elderly females and a center for elderly males) in Zabol. This study was approved in the Ethics Committee of Zahedan University of Medical Sciences (capital of the province) under the code IR.ZAUMS.REC.1392.6039. All the institutionalized elderly agreed to participate in the study and signed a written consent form.

Oral examinations were carried out using mirror and probe under proper light in an upright position and oral lesions were recorded. The oral examination is performed only by a senior dental student that was exclusively trained by supervisors regarding oral lesions of elderly patients. If clinical diagnoses needed confirmation with laboratory tests, patients were referred to Zahedan Dental School. The diagnosis of oral mucosal lesions was made based on WHO guidelines (21). The dental status of the elderly was determined using the WHO's criteria (22). To determine the DMFT index, the total number of decayed, missing, and filled teeth was calculated.

The GOHAI questionnaire, whose validity and reliability had been previously confirmed in the Persian-speaking population (23), was used to determine HORQoL and completed with interview. GOHAI is a 12-item questionnaire scored with a likert scale of 1 to 5 with a total score of 12-60. Higher scores indicate higher OHRQoL levels.

The data were entered into SPSS software version 21.0 (IBM SPSS Inc, Chicago, IL), and relationship between age, gender, education, smoking, systemic disease, and the use of denture and presence of oral lesions were analyzed by student t test, Fisher's exact test, and binary logistic regression. In addition, the relationships between DMFT or GOHAI with various factors were analyzed with Mann-Whitney test, student t test, and Spearman correlation. P<0.05 was considered statistically significant.

Results

In this study, 90 institutionalized elderly with a mean age of 72±9.8 (age range 60 to 96) underwent oral examination. Regarding gender, 53.3% of the examined individuals were males with a mean age of 72.9±10.1, and 46.7% were females with a mean age of 71±9.4.

Oral lesion

Among the examined individuals, 39 (43.3%) had oral lesions, one of whom (2.6%) had a denture-related lesion (denture stomatitis). The rest of the individuals (97.4%) had other types of lesions. It should be noted that 11 (12.2) participants used dentures, and 71.8% had only one and 28.2% had two oral lesions. Oral lesions were located on the tongue (88%), lip (6%), buccal mucosa (4%), and the mandibular alveolar mucosa (2%). Fissured tongue (50%) was the most common oral lesion among the participated elderly. Other lesions were coated tongue (22%), oral varix (18%), denture stomatitis (2%), angular cheilitis (2%), atrophic tongue (2%), recurrent aphthous (2%), and fordyce granule (2%). No case of malignancy was observed.

The mean age of the individuals with oral lesions and those without oral lesions was 71±9.4 and 72.8±10.1 years, respectively. The student t-test showed no significant relationship between the presence of oral manifestations and age (P=0.39). As shown in Table I, more than 70% of the elderly who had oral lesions were female. Binary logistic regression test revealed that gender and presence of systemic disease can probability predict the oral lesion occurrence. (Table II)

Table I: Relationship between oral lesions and different variables in institutionalized elderly of Southeast Iran

		Oral lesions						
		Yes		No		Total		
Variables		N	%	N	%	N	%	P value*
Gender								
	Male	11	28.2	37	72.5	48	53.3	0.0001
	Female	28	71.8	14	27.5	42	46.7	
Educational status								
	Illiterate	29	74.4	42	82.4	71	78.9	0.437
	Literate	10	25.6	9	17.6	19	21.1	
Smoking								
	Yes	21	53.8	18	35.3	39	43.3	0.090
	No	18	46.2	33	64.7	51	56.7	
Systemic disease								
	Yes	23	59	42	82.4	65	72.2	0.018
	No	16	41	9	17.6	25	27.8	
Use of denture								
	Yes	2	5.1	9	17.6	11	12.2	0.105
	No	37	94.9	42	82.4	79	87.8	

Fisher's Exact Test

Table II: Binary logistic regression test for probability prediction of oral lesions occurrence

Variable		Coefficient	Standard error	Odds ratio	P value
Gender	Male	1.81	0.49	6.14	<0.001
	Female				
Systemic disease	Yes	1.18	0.57	3.26	0.038
	No				

Dental Status

The mean DMFT (range) was 25.6±7.3 (5-32), 4.6±5.01 (0-19) for decayed teeth, 21±10.2 (0-32) for missing teeth, and 0.04±0.3 (0-2) for filled teeth. All participants had a DMFT higher than zero, and 28 were completely edentulous. Only one of the elderly had 2 filled teeth. Moreover, the Spearman's test showed no correlation between age and DMFT (P=0.3, r=0.1). As shown in Table III, no significant relationship was observed between DMFT and gender, education, smoking and systemic disease.

Table III: Relationship between DMFT and different variables in institutionalized elderly of Southeast Iran

		Number	Mean	Std. Deviation	P Value*
DMFT					
Variables					
Gender					
	Male	48	25.9	6.24	0.76
	Female	42	25.31	8.39	
Educational status					
	Illiterate	71	24.76	7.71	0.051
	Literate	19	28.84	4.21	
Smoking					
	Yes	39	27.05	6.85	0.065
	No	51	24.53	7.48	
Systemic disease					
	Yes	65	26.2	6.55	0.309
	No	76	24.1	8.91	

GOHAI Measurement

The mean GOHAI was 42.8±9.7 with a minimum and maximum of 19 and 60, respectively. The Spearman's test showed no correlation between GOHAI and age (P=0.99, r=-0.001), DMFT (P=0.919, r=0.011), decayed teeth (P=0.04, r=-0.22), missing teeth (P=0.22, r=0.13), and filled teeth (P=0.43, r=0.08). Table IV shows the relationship between GOHAI and gender, education, smoking, systemic disease, edentulous, the use of denture and presence of oral lesions. Smoking and the presence of oral lesions significantly reduced the OHRQoL.

Table IV: Relationship between GOHAI and different variables in institutionalized elderly of Southeast Iran

Variables	Number	Mean	Std. Deviation	P Value*
GOHAI				
Gender				
Male	48	44.06	9.58	0.187
Female	42	41.36	9.67	
Educational status				
Illiterate	71	42.70	9.79	0.857
Literate	19	43.16	9.44	
Smoking				
Yes	39	39.97	10.30	0.014
No	51	44.96	8.64	
Systemic Disease				
Yes	65	41.67	8.74	0.174
No	25	44.50	10.82	
Edentulous				
Yes	28	44.61	8.52	0.235
No	62	41.98	10.1	
Use of denture				
User	11	46.64	6.1	0.161
Non user	79	42.27	9.97	
Presence of oral lesions				
Yes	39	40.10	9.63	0.020
No	51	44.86	9.26	

Discussion

The prevalence of oral mucosal lesions in this study was 43.3%, which is lower than the prevalence reported by most studies in other regions (5, 13, 14). The prevalence was higher than the rate reported by Taiwo et al. in Nigeria (22.4%) and Mendes et al. in Brazil (21.5%) (8, 24). The difference in the prevalence of oral lesions has been attributed to the demographic, methodological, and socio-cultural differences and access to oral health programs as well as the genetic diversity of the elderly (5, 14). In this study, the majority of the elderly (71.8%) had only one oral lesion, which is consistent with other studies (13, 25). Fissured tongue was the most common oral lesion in the present study population, which is similar to studies by Al-Maweri et al.(5) and Mozafari et al.(14); however, the exact prevalence rate varies in different studies. The risk of fissured tongue increased with age (26). The difference in the prevalence of fissured tongue in different populations has been attributed to differences in diagnostic criteria of fissured

tongue, allergic diseases, nutritional deficiencies, and genetic diversity (5, 14, 26).

Mujica et al.(13) showed that oral lesions are more prevalent in women than in men, which is consistent with the result of the present study. High prevalence of oral lesions can stem from oral habits, systemic diseases, and poor oral hygiene in females. It has been found that epithelium becomes thinner and its elasticity decreases with age, leading to impaired tissue repair and reduced resistance to diseases (1). However, in this study, no significant relationship was found between oral lesions and age, educational status, smoking, and use of denture, which is consistent with other studies(8, 14, 27, 28).

The relationship between the occurrence of oral lesions and systemic diseases was significant which is in contrast to other studies (8, 14). Interestingly, most participants who had systemic diseases did not have oral lesions. This could be due to the fact that frequency of systemic diseases in this study was more than two-third which did not allow for the exact evaluation of the impact of systemic diseases on the occurrence of oral lesions. Systemic diseases can make the individual incapable of maintaining oral hygiene on one hand and directly or indirectly (due to the treatments) cause oral diseases on the other hand (1).

The mean DMFT in this study was 25.6, which is higher than the values reported in the studies conducted in USA (17), Mexico (29), Spain (9), China (30), and India (31) and lower than those in Brazil (8, 10, 32). Moreover, various studies have reported the edentulous rate in the elderly ranges from 9% to 93.5% (17, 18, 33). The edentulous rate in this study was 31.11%. The previously-mentioned reasons for the differences in the prevalence of oral lesions in different communities also apply to the dental status of the elderly. DMFT had no significant relationship with age, gender, education, smoking and systemic diseases, which is consistent with some studies (17, 19, 31, 32).

The mean GOHAI value in this study was 42.8, which is lower than the values reported by similar studies (6, 19, 20, 29). This can be attributed to various parameters, including social, economic, and cultural factors, oral health status, and access to treatment and dental care in different populations (9). On the other hand, given that providing dental treatments have been found to increase the quality of life in institutionalized elderly (34), low GOHAI levels in the region highlights the need for proper planning to promote dental care.

The relationship between the GOHAI and age, gender, systemic disease, edentulous, or use of denture was not significant which is consistent with other studies (9, 11,

19, 20, 29, 35). The mean GOHAI was higher in the literate participants compared to the illiterate ones. It has already been shown that low educational status independently and negatively affects the quality of life of the elderly (16, 36). So far, other studies have failed to properly show the effects of smoking on OHRQoL (11, 15), while our study showed that elderly smokers had a significantly lower OHRQoL than the nonsmokers. The positive relationship between tobacco use (chewing and smoking) and the occurrence of benign, malignant, and pre-malignant oral changes has been proved (37). Smoking also leads to poor oral hygiene, gingival recession, and increased dental caries (30). On the other hand, smoking causes nutritional deficiencies in the elderly that can significantly reduce the mean GOHAI (38). Therefore, smoking can reduce OHRQoL through increasing dental caries and oral lesions and causing nutritional deficiencies.

The elderly with oral lesions had significantly lower quality of life than those without oral lesions. Oral lesions cause discomfort including pain and difficulty in speaking, chewing, swallowing and even affect the esthetics of an individual due to disruption in daily social activities. Shao et al. showed that the elderly with normal mucosa condition had a higher GOHAI than those with abnormal mucosal condition but this difference was not statistically significant (36). Unlike other studies, this study showed no correlation between DMFT and the number of missing teeth, and GOHAI, while dental caries negatively affected the quality of life in the elderly.(19, 23, 36)

Strength of this study was the evaluation of numerous social and cultural factors and their relationship with oral and dental status of institutionalized elderly in Southeast Iran. This study was the first to examine the OHRQoL and its relationship with other factors in institutionalized elderly in Iran. Limitations of this study include small study population and cross-sectional study design which led to failure in showing the precise and definite relationship between different factors and dental and oral status or OHRQoL. Therefore, it is recommended that future studies be conducted on larger populations and on a long-term basis with consideration of various hematological and salivary factors in addition to all social, cultural, and financial factors.

Conclusion

Relatively high prevalence of oral lesions, poor dental status, and low OHRQoL levels were observed in institutionalized elderly in the region. Oral health in the elderly seems to be neglected in the welfare centers and emphasizes on the need for planning on training of caregivers, promotion of preventive care, and treatment

of dental and oral problems. Regular dental and oral checkups should be a part of the services received by institutionalized elderly, aiming at improving their quality of life.

Acknowledgment

Conflict of Interest

The authors have declared no conflict of interests for the present study.

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