Turkish Journal of Geriatrics
DOI: 10.31086/tjgeri.2018344044
2018;21(3):313-322

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RESEARCH

ASSESSMENT OF ORAL HEALTH-RELATED QUALITY OF LIFE AMONG ELDERLY PATIENTS WITH PERIODONTAL DISEASE

Abstract

Introduction: The aim of this study was to assess the impact of oral health-related quality of life in elderly patients with periodontal disease.

Materials and Method: In total, 110 elderly patients (age range 65 to 92) were included in this study. The Geriatric Oral Health Assessment Index questionnaire was used to determine the perceived oral health-related quality of life of the participants. Gingival index, plaque index, clinical attachment level, probing pocket depth, and bleeding on probing measurements were performed to determine the periodontal status.

Results: The total Geriatric Oral Health Assessment Index score was significantly higher among elderly patients with severe periodontitis (25.69±6.80) than among those with gingivitis (21.35±7.01). Higher scores indicate a poorer oral health-related quality of life among elders with periodontal disease. Furthermore, this score was significantly associated with gingival recession, mobile teeth, and oral malodor ($p<0.05$).

Conclusion: As the severity of periodontal disease increases, a poorer oral health-related quality of life is observed. Having an overview of the adverse effects of periodontal problems on the daily life of elderly patients will facilitate the understanding of the relationship between general health and oral health. Additionally, the assessment of oral health-related quality of life may play an important role in clinical practice regarding identification of patients' oral health conditions and treatment needs and improving patient communication.

Keywords: Aged; Quality of Life; Periodontal Diseases

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Received: 01/05/2018
Accepted: 03/09/2018

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ARAŞTIRMA

PERİODONTAL HASTALIĞI OLAN YAŞLI HASTALARDA AĞIZ SAĞLIĞIYLA İLİŞKİLİ YAŞAM KALİTESİNİN DEĞERLENDİRİLMESİ

Öz

Giriş: Bu çalışmanın amacı yaşlılarda periodontal hastalığın, ağız sağlığı ile ilişkili yaşam kalitesi üzerine etkisini değerlendirmektir.

Gereç ve Yöntem: Çalışmaya 110 yaşlı hasta (yaş aralığı 65-92 arasında olan) dahil edildi. Bireylerin algılanan ağız sağlığı ile ilişkili yaşam kalitesini belirlemek için Geriatrik Ağız Sağlığı Değerlendirme Endeksi anketi kullanıldı. Periodontal durumu belirlemek için plak indeksi, gingival indeks, sondalamada kanama, sondalanan cep derinliği ve klinik ataşman seviyesi ölçümleri yapıldı.

Bulgular: Şiddetli periodontitise sahip yaşlılardaki toplam Geriatrik Ağız Sağlığı Değerlendirme Endeksi skoru (25.69±6.80), gingivitisi olan yaşlılara göre (21.35±7.01) anlamlı derecede yüksekti. Daha yüksek puanlar periodontal hastalığa sahip yaşlılar arasında daha kötü bir ağız sağlığı ile ilişkili yaşam kalitesi olduğunu gösterdi. Geriatrik Ağız Sağlığı Değerlendirme Endeksi skoru dişeti çekilmesi, diş mobilitesi ve ağız kokusu ile ilişkili bulundu ($p<0.05$).

Sonuç: Periodontal hastalığın şiddeti arttıkça daha düşük bir ağız sağlığı ile ilişkili yaşam kalitesi skoru gözlenmektedir. Yaşlılardaki periodontal problemlerin günlük yaşamdaki olumsuz etkilerini belirlemek, genel sağlık ve ağız sağlığı arasındaki ilişkiyi de anlamaya yardımcı olacaktır. Ek olarak, ağız sağlığı ile ilişkili yaşam kalitesinin değerlendirilmesi, hastanın ağız sağlığı durumunu ve tedavi gereksinimlerini tanımlamak ve hastalarla iletişimi geliştirmek açısından da klinik uygulamalarda önemli bir rol oynayabilir.

Anahtar sözcükler: Yaşlı; Yaşam Kalitesi; Periodontal Hastalıklar

INTRODUCTION

Periodontal diseases are complex inflammatory diseases characterized by progressive destruction of peripheral connective tissue and the alveolar bone; they continue to be a major oral health problem (1). Although aging induces changes in the oral mucosa, jawbones, and teeth, periodontal disease is not a natural consequence of aging. Periodontal diseases, and consequently tooth loss, among the elderly are considered to be caused by systemic diseases, drugs, psychological issues, and a decreased interest in or ability to perform oral hygiene practices (2).

Periodontal disease is the most common cause of tooth loss in the elderly and can lead to deterioration of eating habits and chewing function among them, negatively affecting the quality of life (QoL) (3). Furthermore, periodontal disease is associated with clinical symptoms such as persistent oral malodor, chronic inflammation, bleeding on brushing, redness, and loosening of affected teeth (1). These clinical symptoms may significantly affect QoL because oral health has a major impact on the functional, structural, aesthetic, physiological, and psychosocial aspects of life (4).

Oral health-related quality of life (OHRQoL) is a multidimensional concept that includes the nutrition of individuals, their sleeping habits, the variables affecting their communication with other individuals, and their satisfaction with oral health (5). The relationship between patient-centered outcomes and periodontal treatment has recently been explored from a wider perspective (6,7). Needleman et al. explored the effect of oral health on quality of life in a group of patients with periodontal disease (8). After the aforementioned study, the number of studies investigating the effect of periodontal disease on QoL increased (1,9).

Periodontal disease is a common problem among the elderly all over the world and is the leading cause of oral health problems among elderly people (3). However, studies on QoL in the elderly have been conducted regarding conditions such as dental caries, xerostomia, or tooth loss (10,11). Little has been reported about OHRQoL associated with periodontal disease or health in the elderly population (12).

"The assessment of OHRQoL has an important role in clinical practice as well as in oral health research (13). The Geriatric Oral Health Assessment Index (GOHAI), one of the most comprehensive assessment instruments for OHRQoL measurement, was developed to be used in the elderly population. It is a 12-item measurement tool that measures oral physical functioning problems reported by the patient while also assessing psychosocial effects resulting from oral diseases (14).

The aim of this study was to determine the effects of periodontal disease on quality of life of the elderly, considering that a better understanding of the perceived effects of periodontal disease among elderly individuals may help plan and improve patient care and reduce their anxieties.

MATERIALS AND METHOD

The study protocol was approved by the Ethics Committee of Cumhuriyet University (decision no.:2017-01/29). The study was performed in accordance with the relevant guidelines of the Declaration of Helsinki. The information about the study purpose, content, and procedures was provided either verbally or in writing in the participant information and approval form. Patients willing to participate in the study have signed this form.

Study population

In total, 240 elderly patients (age range 65 to 92) were recruited from the Periodontology Department, Faculty of Dentistry, Gaziosmanpasa University, between December 2016 and June 2017. Four patients refused to participate, and 126 patients met the exclusion criteria. Consequently, 110 patients were included in the study.

Inclusion criteria included presence of at least 15 teeth and good general health. Smokers and individuals with any systemic disease that may affect periodontal status were excluded from the study because smoking and systemic diseases, such as cardiovascular disease or diabetes, may increase the risk of periodontal disease and have a greater impact on QoL. Patients who had undergone periodontal treatment in the last 6 months, suffered from tooth pain due to deep caries, or had psychiatric disorders were also excluded from the study.

Periodontal examination

Another group of 15 randomly selected patients who were not included in the study population were evaluated to estimate the reliability of measurement methods prior to the implementation. A duplicate examination of periodontal measurements was performed within 24 h of the initial evaluation. The kappa values of periodontal data were all over 0.78.

After recording the demographic characteristics of each patient, a detailed periodontal examination was performed. Plaque index (PI) (15), gingival index (GI) (15), probing pocket depth (PPD), bleeding on probing (BOP), and clinical attachment level (CAL) measurements were performed. PPD was measured in millimeters from the gingival margin to the base of the periodontal pocket. CAL was calculated as the distance in millimeters from the cementoenamel junction to the bottom of the periodontal pocket. BOP was recorded based on the presence or absence of bleeding up to 60 s after probing at the experimental sites. The measurements were performed using a periodontal probe (Hu-Friedy Co., Chicago, IL, USA) at six sites per tooth (mesiobuccal, midbuccal, distobuccal, mesiolingual, midlingual, and distolingual), excluding third molars. Chronic periodontitis and gingivitis were diagnosed based on the clinical and radiographic criteria by one calibrated examiner (OG). Gingivitis was diagnosed if gingival inflammation was present without loss of connective tissue attachment and probing pocket depth>3 mm. Moderate chronic periodontitis was diagnosed if periodontal attachment loss of ≥4 mm and probing pocket depth 3-5 mm in over 30% of the remaining teeth was present. Severe chronic periodontitis was diagnosed if periodontal attachment loss of ≥6 mm and probing pocket depth>5 mm in over 30% of the remaining teeth was present (16).

Assessment of quality of life

The impact of periodontal disease on QoL of elderly patients was assessed using GOHAI; it is a 12-item measurement tool developed as a self-reported oral health assessment index, especially for use in the elderly population. This index evaluates the effects of oral conditions on QoL of the elderly in three dimensions: physical function (item 1-4), psychosocial impacts (item 6, 7, 9, 10 and 11), and pain and/or discomfort (item 5, 8 and 12) (14). Elderly patients answered the negatively framed questions more easily and appropriately (17). Therefore, three items in the GOHAI questionnaire (items 3, 5, 7) were expressed negatively. Each of the 12 items is scored from 1 to 5 (always = 5, often = 4, sometimes = 3, seldom = 2, never = 1). Consequently, the total score ranged from 12 to 60, with higher scores indicating a poorer OHRQoL. The Turkish version of GOHAI showed acceptable reliability and validity (18).

Furthermore, the patients were asked to provide a checklist of symptoms related periodontal disease, such as gingival recession, swollen gums, loose teeth, mobile teeth, and oral malodor, comparing these to symptoms in past years.

Statistical analysis

Data were analyzed using the statistical package SPSS 11.0 (SPSS Inc., 2002). With an effect size of 0.29 and to provide a 5% confidence interval was considered appropriate a sample size of at least 108. Variations in mean self-reported periodontal disease symptoms and GOHAI scores were investigated using bivariate analysis using t-tests for independent samples. One way variance analysis

(One way ANOVA) was employed to examine the differences in GOHAI and subscales scores of elders between the different periodontal statuses. Pearson correlation coefficients were used to measure correlations of the association between clinical periodontal measurements and GOHAI scores. The values of Cronbach's alpha were calculated to assess the internal consistency.

RESULTS

In this study, 110 patients (56 females and 54 males) completed the GOHAI questionnaire. Sociodemographic characteristics of the elderly patients are presented in Table 1. The number of patients with gingivitis, moderate chronic periodontitis, and severe chronic periodontitis were 31, 40, and 39, respectively. Of all the patients, 90.9% were primary school graduates (Table 1).

In Table 2, the general distribution of responses according to GOHAI items were shown. The effect of oral health on QoL of the elderly was shown to be important in terms of physical function, pain, discomfort, and psychosocial effects. Approximately 12% of the elderly had difficulty eating due to teeth and gum problems, and about 30% of them had problems chewing or biting. Furthermore, 20% of the elderly were unhappy with the appearance of their gums and teeth (Table 2).

As presented in Table 3; individual subscales, internal consistency, and the mean scores for GOHAI. Cronbach's alpha values were 0.778 and 0.714–0.736 for GOHAI and individual subscales, respectively.

The comparison of GOHAI and subscale scores according to periodontal disease status such as gingivitis, mild periodontitis, and severe periodontitis is shown in Table 4. A significant difference in total score and physical function subscale was found between elderly patients with gingivitis and those with severe periodontitis. However, the differences in psychosocial impact and pain and discomfort subscales were not significant.

OHRQoL of elderly patients was found to be associated with self-reported periodontal symptoms (Table 5). The GOHAI score was found to be significantly associated with gingival recession, mobile teeth, and oral malodor. Swollen gums, loose teeth, and sore gums were not found to be associated with the GOHAI score.

The correlations between GOHAI scores and periodontal clinical measures are shown in Table 6. Psychosocial impacts subscale score was found associated with 3-5 mm probing pocket depth. Pain and discomfort subscale score was affected by gingival recession (Table 6).

Table 1. Sociodemographic characteristics and periodontal status of elderly.

Variable	
Age (years)	72.13±4.33
Gender [n (%)]	
Men	54 (49.1)
Women	56 (50.9)
Marital status [n (%)]	
Married	88 (80.0)
Widowed	22 (20.0)
Education Level [n (%)]	
Primary school	100 (90.9)
Secondary school	- (-)
High school	4 (3.6)
University	6 (5.5)
Periodontal status [n (%)]	
Gingivitis	31 (28.2)
Mild periodontitis	40 (36.4)
Severe periodontitis	39 (35.5)

Table 2. Distribution of GOHAI individual item response.

	Never (1)	Seldom (2)	Sometimes (3)	Often (4)	Always (5)	Mean scores
Physical function						
1. Limit the kinds of food	47 (42.7)	30 (27.3)	19 (17.3)	9 (8.2)	5 (4.5)	2.05
2. Trouble biting / chewing	30 (27.3)	24 (21.8)	34 (30.9)	12 (10.9)	10 (9.1)	2.53
3. Uncomfortable to swallow	54 (49.1)	31 (28.2)	15 (13.6)	4 (3.6)	6 (5.5)	1.88
4. Prevented from speaking	58 (52.7)	31 (28.2)	8 (7.3)	8 (7.3)	5 (4.5)	1.83
Psychosocial impacts						
6. Limit contacts with people	75 (68.2)	16 (14.5)	11 (10)	2 (1.8)	6 (5.5)	1.62
7. Unhappy with appearance of gums and teeth	57 (51.8)	19 (17.3)	22 (20)	7 (6.4)	5 (4.5)	1.94
9. Worried about teeth or gums	51 (46.4)	32 (29.1)	22 (20)	3 (2.7)	2 (1.8)	1.84
10. Nervous / Self-conscious of teeth or gums	55 (50)	24 (21.8)	24 (21.8)	2 (1.8)	5 (4.5)	1.89
11. Uncomfortable eating in front of others	63 (57.3)	19 (17.3)	13 (11.8)	2 (1.8)	13 (11.8)	1.94
Pain and discomfort						
5. Discomfort when eating	44 (40)	11 (10)	26 (23.6)	14 (12.7)	15 (13.6)	2.5
8. Use medication to relieve pain	54 (49.1)	22 (20)	23 (20.9)	6 (5.5)	5 (4.5)	1.96
12. Gums. teeth sensitive to hot/cold	48 (43.6)	22 (20)	23 (20.9)	1 (0.9)	16 (14.5)	2.23

Values are given as n (%)

Table 3. Individual subscales, internal consistency and the mean scores for GOHAI.

	Mean scores	Internal consistency
GOHAI	23.24±6.86	0.778
Physical function	8.29±2.9	0.736
Psychosocial impacts	9.23±3.98	0.734
Pain and Discomfort	6.69±3.22	0.714

Table 4. GOHAI and subscales scores of elders with mild / severe periodontitis and gingivitis and periodontal clinical measurements.

	Gingivitis (n=31)	Mild periodontitis (n=40)	Severe periodontitis (n=39)	p
GOHAI	21.35±7.01[a]	22.30± 6.23[ab]	25.69±6.80[b]	< 0.005
Physical function	7.19±2.36[a]	8.53±3.29[ab]	8.92±2.69[b]	< 0.005
Psychosocial impacts	6.52±3.46	6.03±2.52	7.51±3.55	0.114
Pain and Discomfort	9.23±4.67	8.88±4.06	9.59±3.33	0.731
CAL(mm)	-	3.94±1.15	6.15±1.64	< 0.005
PPD(mm)	2.07±0.26[a]	3.08±1.03[b]	4.96±1.25[b]	< 0.005
GI	2.14±0.53	2.25±0.65	2.36±0.47	0.070
BOP (%)	69.42±19.45[a]	78.48±18.23[ab]	81.66±17.84[b]	< 0.005
PI	1.77±0.58	2.05±0.63	2.33±0.57	0.195

ab The different letters in the row indicate statistical significance.

Table 5. Quality of life and self-reported periodontal symptoms of the elders.

	n (%)	GOHAI scores (mean±sd)	p
Swollen gums			
Yes	52 (47.3)	23.1±6.33	0.931
No	58 (52.7)	22.98±7.21	
Sore gums			
Yes	57 (51.8)	23.44±7.21	0.521
No	53 (48.2)	22.6±6.31	
Gingival recession			
Yes	59 (53.6)	24.1±7.2	< 0.005
No	51 (46.4)	21.8±6.08	
Mobile teeth			
Yes	62 (56.4)	24.13±6.62	< 0.005
No	48 (43.6)	22.19±6.82	
Loose teeth			
Yes	53 (48.2)	23.74±7.01	0.631
No	57 (51.8)	22.28±6.5	
Oral malodor			
Yes	50 (45.5)	24.13±7.52	< 0.005
No	60 (54.5)	21.72±5.55	

Table 6. The correlations between GOHAI scores and periodontal clinical measures.

	GOHAI scores	Physical function	Psychosocial impacts	Pain and discomfort
PI	.131	.078	.165	.029
GI	.017	.017	.034	-.020
PPD<3mm (Gingivitis)	-.071	.049	-.122	-.030
PPD 3-5mm (Moderate periodontitis)	-.125	-.330*	.101	-.140
PPD>5mm (Severe periodontitis)	.293	.349	-.239	.159
REC	.125	-.069	.140	.205*

Statistical analysis was performed by a Pearson correlation coefficient test.
*p<0.05, **p<0.01

DISCUSSION

Recently, periodontal treatment and patient satisfaction, in other words, patient-focused outcomes have been explored with a broader concept (6,9). With the increasing interest in QoL, the number of articles on this subject is also increasing (1,4). Although studies reporting QoL as a patient-focused measurement strategy have been published in areas such as orthodontics and oral surgery, little information has been reported on OHRQoL associated with periodontal disease or health (1). Additionally, OHRQoL associated with periodontal disease is a less investigated issue than OHRQoL associated with other oral problems such as tooth loss and dental caries (19). Moreover, periodontal disease is a widespread problem among the elderly worldwide and is the leading cause of oral health problems in this population (3). However, little is known about the impact of oral health on QoL of the elderly population with periodontal disease.

In the study by Needleman et al., the effect of oral health on QoL was assessed using oral health related quality of life – United Kingdom (OHRQoL-UK) in a periodontal patients' group, and periodontal status was demonstrated to have a marked effect on QoL (8). Subsequently, in a study by Ng and Leung, the differences in QoL were investigated using the Oral Health Impact Profile-14 (OHIP-14) in various periodontal conditions, and a significant correlation was found between periodontal disease and OHRQoL. The OHRQoL score was significantly different among patients with different periodontal status (1). The present study showed a significant difference between the GOHAI scores of elderly patients with different periodontal status. No such study has yet been conducted involving elderly patients with different periodontal status, but our study results corroborate with a study by Irani et al. that showed significantly different OHRQoL scores in non-diabetic patients with different periodontal status (20).

Similarly, in the present study, elderly patients with severe periodontitis had significantly higher GOHAI and physical function subscale scores than those with gingivitis regarding the impact of oral health on their QoL. Therefore, while elderly patients might perceive their physical functions to be significantly affected by their oral status, they would not be significantly affected in terms of pain, discomfort, and psychosocial effects at the same time. Patients usually continue to live with fewer symptoms such as tooth mobility without any sense of pain, swelling, and bleeding, or no symptoms at all. Therefore, periodontal diseases are commonly regarded as "silent diseases" (4). Moreover, social

anxiety may not be as important among the elderly as it is among young people (21). Consistent with this, the most important factor for elderly patients is the ability to chew well (10). The present study findings show that the greatest effects of periodontal disease on QoL of elderly patients are related to trouble biting/chewing, discomfort when eating, and gums or teeth being sensitive to hot/cold, whereas limited contact with people, being prevented from speaking, and worries about teeth or gums have a lesser impact.

Ozçelik et al. evaluated the postoperative effects of different treatments on health-related QoL in patients with periodontitis. The preoperative GOHAI scores of the three test groups ranged from 24.5 to 26 (9). In this study, the GOHAI scores of elderly patients with chronic periodontitis were similar to those reported by Ozçelik et al (9). Guzeldemir et al. conducted a study on Turkish population and investigated the periodontal status of patients undergoing hemodialysis; they reported that the GOHAI score was 15.72±8.68, which is lower than the GOHAI scores in the present study (22). The elderly population and the generally poorer periodontal status in the present study group may explain the differences. The mean GOHAI scores in studies investigating periodontal status and OHRQoL reported in literature range between 12.2 and 44.1 (23, 24), which indicates the effect of factors such as a variety of conceptual models, social and cultural differences, individual history, treatment of oral problems, and access to dental care (4).

In this study, the impact of oral health was found to have significant importance on QoL of elderly patients with periodontal disease. The findings emphasize the importance of the impact periodontal disease can have on a person's daily life and overall QoL. Socially and economically disadvantaged elderly patients may be at a greater risk for periodontal disease. As people age, their physical and mental capacities may diminish. This also affects their ability to maintain oral health (25). Therefore, the elderly are more susceptible to periodontal disease (2). Moreover, periodontal disease is a major cause of tooth loss (1). The number of teeth present in oral cavity is an important indicator of oral function and oral health. It has been reported that the number of remaining teeth in the elderly is related to the ability to chew, intake of nutrients, and QoL (10). This may reflect the importance of the impact of periodontal disease in elderly patients.

Changes in OHRQoL were evident due to the symptoms of periodontal disease reported by the patients themselves. Presence of "gingival recession," "mobile teeth," and "oral malodor" were associated with a poor QoL. An important feature of patient-centered measures is their discriminative ability. Elderly patients with severe periodontal destruction are reported to have poorer OHRQoL. This supports the idea that the measurement of OHRQoL is susceptible to self-reported and clinically observed periodontal status (1,8,23).

Cronbach's alpha of OHIP-14S and subscale scores were high; the reliability of the scale is accepted as good. The lowest Cronbach's alpha (0.71) values were associated with pain and discomfort subscale. These values indicate that the scale as a whole and its sub-dimensions are self-consistent and the items have reasonably satisfactory validity when applied in the present sample of subjects.

This study has some limitations. Ultimately, the examined elderly patients were selected from a population sample that was referred to the dental faculty. In this respect, the generalizability of existing findings cannot be considered satisfactory. However, the study by Ng and Leung showed that periodontal destruction can directly affect QoL (1). Participants in this study were elderly patients diagnosed with periodontal disease by a specialist periodontologist. At this point, it is important to understand that periodontal problems in elderly patients affect their daily lives and the resulting difference in oral health is understandable.

In conclusion, the assessment of OHRQoL may play an important role in clinical practice in terms of identifying patients' oral health condition and treatment needs as well as improving communication with them. From a periodontal point of view, this is important in terms of understanding perceptions and concerns about the consequences of periodontal disease, their impact on the lives of elderly patients, planning periodontal care, meeting the needs of elderly patients, eliminating their concerns, and emphasizing the importance of periodontal care in society.

Conflict of interest

The authors declare that they have no competing interests.

ACKNOWLEDGEMENT

The authors received no financial support for the research, authorship and/or publication of this article. We would like to thank the Osman Demir from Gaziosmanpasa University for their statistical contributions in these study.

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