



# The Quality of Life Associated with Oral Health in Patients Treated with Removable Denture in Prosthodontics Department of School of Dentistry in Sari, Iran, During 2019-2020

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## Abstract

**Background:** Reconstruction of teeth using partial or complete dentures is the only treatment for most edentulous patients. The duration of edentulism and the use of complete dentures can affect the patient's quality of life. Therefore, this study aimed to evaluate the quality of life associated with oral health in patients referring to the Prosthodontics Department, School of Dentistry, Sari, Iran.

**Methods:** In total, 235 patients treated in the Prosthodontics Department, School of Dentistry, Sari, Iran were selected and studied in this descriptive-analytical cross-sectional study. The required information was collected using the Oral Health Impact Profile-14 questionnaire (OHIP-14). Data were analyzed through SPSS22 and using descriptive and analytical tests, such as Mann-Whitney, *t* test, one-way analysis of variance, and multivariate regression.

**Results:** In total, 103 men (43.8%) and 132 women (56.2%) with mean age of  $58 \pm 10.3$  years participated in this study. The duration of denture use was between 3 and 108 months. The mean score of patients' quality of life had a statistically significant relationship with the type of treated jaw, the type of removable prosthesis, and the duration of prosthesis use ( $P < 0.05$ ). However, no statistically significant relationship was observed between the mean score of quality of life with age and gender ( $P > 0.05$ ).

**Conclusion:** Based on the obtained results, the quality of life was higher among those who used dentures for a longer period of time and also in patients with complete dentures. However, the quality of life was lower in people who used mandibular dentures, compared to other groups.

**Keywords:** Dental Prosthesis, Dentures, Oral health-related quality of life, OHIP-14

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## Introduction

Following the loss of natural teeth, a person would have difficulty chewing and speaking. In addition, it will have a latent effect on a person's psychosocial behaviors, such as social activities and self-confidence. Rootlessness, otherwise called edentulism, also affects the quality of life in the elderly (1).

It has been estimated that the number of edentulous patients will quadruple by 2050, compared to the data reported in 1975. In addition, it is important to pay attention to the needs of the edentulous people and factors that affect their quality of life. Iran, the same as other countries, has made progress in the field of oral health, which is indicated by a reduction in the number of edentulous people and their need for treatment with

a denture. However, it should be noted that the number of edentulous people will increase with the growth of the population in Iran (2). Unfortunately, people who use removable dentures experience more psychological and social problems, compared to people with natural teeth. In addition, it may be difficult for some people to get used to dentures. Furthermore, the use of removable dental prostheses requires functional and psychological correction (3).

It should be noted that, the success of a treatment plan in the case of edentulous patients is affected to a great extent by the patients' attitudes and concerns about different aspects of using dentures, such as strength, stability, and comfort, speech, ease of removal from the mouth, and cleaning (3). Based on the evidence, biological,



mechanical, psychological, and aesthetic factors affect patients' satisfaction with denture and treatment success (2). Dental reconstruction with a denture is the only treatment available for most edentulous patients. Therefore, the period of edentulousness and the use of dentures can affect a patient's satisfaction and quality of life (4). It should be noted that the quality of life associated with oral health in the elderly needs to be considered with more care, compared to those who do not use removable dentures (5).

Some studies have already evaluated the effect of prostheses on people's quality of life; however, the results of these studies, which have been conducted using different questionnaires, are somewhat contradictory and dissimilar in different countries. Therefore, due to the importance of the subject and the limited number of studies on the quality of life in edentulous patients, the present study was conducted to evaluate the quality of life associated with oral health in patients referring to the Prosthodontics Department of the School of Dentistry in Sari, Iran, during 2019-2020.

## Materials and Methods

The present descriptive-analytical cross-sectional study was conducted on patients requiring complete and partial dentures (as the single jaw, two jaws, or a combination of both) who had been referred to the Prosthodontics Department of the School of Dentistry in Sari, Iran, during 2019-2020. The treatment process was carried out based on the approval of the respective professor.

Inclusion criteria in this study included edentulousness in one or both jaws, the use of removable dentures for at least eight weeks, patients treated at the School of Dentistry in Sari, Iran, following the approval of the respective professor, and patients who were able to recall the questionnaire information.

However, patients with teeth or implant-supported overdentures, atrophic edentulous ridge, uncontrolled systemic diseases affecting oral tissues such as, diabetes, hypertension, cardiovascular diseases, temporomandibular joint diseases, and patients who had just had their teeth extracted were excluded from the study. A total of 235 individuals were selected and participated in this study based on the inclusion and exclusion criteria.

Patients' health-related quality of life was assessed using Oral Health Impact Profile-14 (OHIP-14) questionnaire. This questionnaire includes seven subgroups of functional limitation, physical pain, mental distress, physical disability, mental disability, social disability, and disability. The validity and reliability of the Persian version of this questionnaire have been confirmed, and each subgroup included two questions (6). The evaluation of responses is conducted using two methods. In the additive (ADD) method, the test options are scored

as never = 0, rarely = 1, sometimes = 2, often = 3, and most often = 4. The total score of the questionnaire is between 0 and 56, and lower scores indicate better quality of life.

In another evaluation method called Simple Count, a score of 0 is given to the "never" and "rarely" options, and the score of 1 is given to the options of "sometimes", "often" and "most often". This method was designed for the respondents who might not understand the real difference between the options of the questionnaire (6). The additive method was used in the present study. The variables studied in this study included gender, age, duration of use of removable dentures, type of removable dentures, and type of treated jaw.

Quantitative variables in this study were presented with descriptive statistics including mean and standard deviation, and qualitative variables, such as age and gender were presented with frequency tables. Data analysis was carried out using Mann-Whitney, *t* test, one-way analysis of variance (ANOVA), and multivariate regression. Data were analyzed through SPSS software (version 22). A *P* value less than 0.05 was considered as statistically significant.

## Results

The participants in this study included 235 patients, including 103 men (43.8%) and 132 women (56.2%), with a mean  $\pm$ SD age of  $58 \pm 10.3$  years and the age range of 30-83 years. The mean  $\pm$ SD duration of denture use in this study was  $15.7 \pm 13.6$  months (from 3 to 108 months). The mean  $\pm$ SD score of quality of life in men and women was  $11.05 \pm 8.6$  and  $12.75 \pm 10$ , respectively. According to the results of the Mann-Whitney test, no statistically significant difference was observed between the two genders ( $P=0.275$ ).

In the present study, most patients (66%) used complete dentures. The frequencies of patients using arch partial denture, partial denture in both jaws, and single-jaw complete denture were 26.4%, 6.4%, and 1.3%, respectively. According to the ANOVA results, there was a statistically significant difference between the quality of life score and denture type ( $P<0.001$ ). The highest and lowest mean  $\pm$ SD scores of quality of life were observed in the group of patients who used partial denture in both jaws ( $20.53 \pm 8.37$ ) and complete denture of both arches ( $9.28 \pm 8.43$ ), respectively (Table 1).

Based on the type of treated jaw, most patients (72.3%) had dental prostheses in both jaws, followed by mandibular dentures (14.5%) and maxillary dentures (13.2%), respectively. Based on ANOVA results, there was a statistically significant relationship between the mean score of quality of life and the type of treated jaw ( $P<0.001$ ). The highest and lowest mean  $\pm$ SD scores of quality of life were observed in the group with mandible denture ( $19.67 \pm 8.91$ ) and complete denture in both jaws ( $10.18 \pm 8.95$ ), respectively.

**Table 1.** The mean score of quality of life in the studied patients based on the studied variables

Variable		Mean	Standard deviation	Minimum	Maximum	P value
Gender	Female	12.75	10	0	45	0.275
	Male	11.05	8.6	0	33	
Denture type	Complete denture	9.28	8.43	0	45	<0.001
	Full arch denture	19.33	7.02	12	26	
	Partial denture in upper and lower arch	20.53	8.37	7	32	
	Full arch partial denture	16.45	9.4	0	37	
Type of treated jaw	Maxilla	13.58	8.85	0	36	<0.001
	Mandible	19.67	8.91	5	37	
	Both maxilla and mandible	10.18	8.95	0	45	

Table 2 presents the classification of patients in the two age groups under and over 50 years. According to this table, no statistically significant difference is observed in the mean score of quality of life among different age groups ( $P=0.18$ ).

According to Table 3, the highest frequency of selecting “usually” in response to OHIP-14 questionnaire items was 15.3% for item 4, followed by 14% and 13.2% for items 3 and 5, respectively. Based on the obtained percentages, oral pain when using removable dental prostheses and problems with eating were the major complaints of the studied patients. Moreover, the highest frequency of “never” response was given to items 10 to 14, and 97% of patients had chosen “never” for responding to item 14, indicating that most of the respondents were satisfied with the psychological and social effects of treatment with a removable denture on their lives.

The results of the multivariate regression test showed that there was a statistically significant relationship between the quality of life and duration of denture use ( $P=0.001$ ), indicating that one unit (one month) increase in the score of dental prosthesis use decreased the score of patients' quality of life by 0.145 points. Moreover, based on this analysis, there was a statistically significant relationship between the quality of life and type of dental prosthesis ( $P=0.001$ ). However, as it is seen in Table 4, no statistically significant relationship was observed between the quality of life and variables of age ( $P=0.123$ ) and gender ( $P=0.166$ ).

## Discussion

Many studies indicate an important relationship between oral health and higher quality of life (7). Many studies have been conducted on the quality of life in the field of medical and dental sciences, and the results have indicated that oral health has a direct impact on the quality of life. Quality of life questionnaires plays an important role in the evaluation of factors associated with oral health.

Epidemiological studies show that factors, such as age, gender, tooth loss, socioeconomic status, community culture, fear of dental treatment, and smoking can all affect one's quality of life (8). Some studies have evaluated

**Table 2.** Assessment of the mean score of quality of life in terms of age groups

Type of variable (age)	Number	Mean	Standard deviation	Mean standard error	P value
≤50 (year)	58	13.48	9.19	1.20677	0.18
>51 (year)	177	11.58	9.55	0.71737	

the effect of using dental prostheses on people's quality of life; however, the results of these studies have been somewhat contradictory in different countries in which different questionnaires have been used in this regard. Therefore, the present study was conducted to evaluate the quality of life in patients treated with removable dentures in the Prosthodontics Department of School of Dentistry in Sari, Iran, during 2019-2020.

Based on the obtained results in the present study, the mean  $\pm$  SD score of quality of life was  $12.75 \pm 10$  and  $11.05 \pm 8.6$  in females and males, respectively; however, no statistically significant difference was observed between the two. The study carried out by Haerian et al examined different dimensions of quality of life in terms of gender using the SF-36 questionnaire and their results indicated no significant relationship between different dimensions of quality of life and gender, which is consistent with the results of the present study (1). The study performed by Vaziri et al assessed the quality of life associated with oral health using the OHIP-14 questionnaire. The results showed that females had a higher mean score of quality of life (9.67), compared to males (4.68); however, this difference was not statistically significant ( $P=0.519$ ), which was consistent with the results of the present study (9). In the study conducted by Shaghaghian et al, the quality of life associated with oral health was evaluated in 200 patients with removable partial dentures in terms of variables, such as age, gender, duration of use, number of jaws, and type of denture materials using OHIP-14 questionnaire. Based on the results, there was no significant relationship between patients' gender and the mean score of quality of life ( $12.7 \pm 10.1$  in men and  $14.5 \pm 10$  in women;  $P=0.213$ ), which was consistent with the results of the present study (2).

In the study conducted by Azar et al, there was no

**Table 3.** Comparison of the mean scores of OHIP-14 questionnaire items

Item	Response Question					Mean (SD)
	Never	Rarely	Sometimes	Usually	Often	
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	
1	97 (41.3)	64 (27.2)	42 (17.9)	22 (9.4)	10 (4.3)	1.08 (1.161)
2	99 (42.1)	69 (29.4)	42 (17.9)	16 (6.8)	9 (3.8)	1.01 (1.106)
3	40 (17)	78 (33.2)	69 (29.4)	33 (14)	15 (6.4)	1.60 (1.118)
4	52 (22.1)	75 (31.9)	57 (24.3)	36 (15.3)	15 (6.4)	1.52 (1.178)
5	84 (35.7)	57 (24.3)	40 (17)	31 (13.2)	23 (9.8)	1.37 (1.344)
6	17 (54)	41 (17.4)	28 (11.9)	25 (10.6)	13 (5.5)	0.96 (1.263)
7	89 (37.9)	52 (22.1)	54 (23)	31 (13.2)	9 (3.8)	1.23 (1.198)
8	103 (43.8)	47 (20)	43 (18.3)	33 (14)	9 (3.8)	1.14 (1.231)
9	130 (55.3)	44 (18.8)	27 (11.5)	22 (9.4)	12 (5.1)	0.90 (1.224)
10	191 (81.3)	22 (9.4)	14 (6)	2 (0.9)	6 (2.6)	0.34 (0.839)
11	198 (84.3)	20 (8.5)	8 (3.4)	7 (3)	2 (0.9)	0.28 (0.743)
12	188 (80)	35 (14.9)	9 (3.8)	2 (0.9)	1 (0.4)	0.27 (6.14)
13	189 (80.4)	24 (10.2)	15 (6.4)	6 (2.6)	1 (0.4)	0.32 (0.744)
14	228 (97)	5 (2.1)	2 (0.9)	0 (0)	0 (0)	0.04 (0.233)

**Table 4.** Regression coefficients for investigation of the relationship of demographic and clinical variables with patients' quality of life

Demographic and clinical variables	B (Regression coefficient)	Mean standard error	t test	P value
Age	0.096	0.062	1.547	0.123
Gender	-1.603	1.152	-1.391	0.166
Duration of denture use	-0.145	0.044	-3.338	0.001
Prosthesis type	2.653	0.464	5.725	0.000

significant association between patient gender and different parts of the oral health-related quality of life (OHRQoL), except for the psychological disability part, which had a higher mean value in men with conventional prosthesis (10). The results of the study conducted by Panek on 300 patients with removable partial prostheses based on the number of follow-up sessions after denture construction showed that men adapt to removable partial dentures easier than women (11). The reason for these differences can be physical and psychological differences between males and females. In addition, such factors as hormonal changes, blood pressure, and psychological issues are highly influential in this regard (12).

In the study performed by Haerian et al, the mean score of quality of life in emotional, mental, general, and physical health domains was higher in people in the age range of 30-39 years. Moreover, this score was higher in people in the age range of 50-59 years in the social domain. Therefore, there was a positive association between age and mean score of quality of life in the Haerian et al study, which was inconsistent with the results of the present study (1).

According to the study carried out by Shaghaghian et al, the mean  $\pm$ SD score of quality of life in 50 years old

and younger individuals was  $15.4 \pm 10.3$ ; however, it was  $12.5 \pm 9.7$  in people older than 51 years. Furthermore, there was a statistically significant difference between different age groups in terms of the mean score of quality of life ( $P=0.047$ ). These results were inconsistent with the results obtained in the present study (2).

According to the results of the study carried out by Shaghaghian et al, there was no statistically significant relationship between the duration of denture use and the mean score of quality of life. The mean score of quality of life in people who used removable dentures less than one year ( $14.1 \pm 9.9$ ) and those who had used it for more than one year ( $13.10 \pm 4.3$ ) was not significantly different. These results were in contrast to the findings of the present study due to the fact that the mean score of quality of life in this study increased with the duration of removable denture use (2).

In the study conducted by Haerian et al, based on ANOVA test results, a statistically significant difference was observed in the mean score of quality of life in all domains in terms of duration of removable denture use ( $P=0.001$ ), which was in line with the results of the present study. However, the highest mean score of quality of life in Haerian et al study was observed in people who had used a removable denture for less than a year (1), which was inconsistent with the findings of the present study.

Albaker in Saudi Arabia compared the quality of life in patients with complete dentures (in both jaws) with those with full arch dentures (in one jaw) using the GOHAI questionnaire. The score of the quality of life in patients who had complete denture ( $28.25 \pm 3.67$ ) was less than those with full arch denture ( $35.12 \pm 11.2$ ), which was consistent with the results of the present study (13). In a systematic

review conducted by Ali et al, tooth-supported fixed dental prostheses (TFDPs) and fixed implant-supported dental prostheses (IFDPs) were noted to have positive short and long term effects on OHRQoL. Removable partial dentures (RPDs) had a positive effect on short-term OHRQoL, and IFDP showed greater short-term improvement in OHRQoL than both RPD and TFDP (14). Also, Htun et al showed that RPD significantly improves objective masticatory performance and OHRQoL in patients with a shortened dental arch (15).

In a study performed by Abbasi et al in Hamedan, Iran, the quality of life associated with oral health was assessed and compared once before denture delivery and another time one month after denture delivery using a standard OHIP-14 questionnaire. The results of their study showed that the questionnaire score decreased significantly after the delivery of the new denture and this decrease was significant in women but not in men, which was inconsistent with the results of the present study (16).

In the present study, 15.3% of patients often suffered from oral pain and 14% suffered from eating problems while using their removable dental prosthesis. This result was consistent with the results of the study conducted by Shekhawat et al in India on patients with removable partial dentures using the OHIP-14 questionnaire and showed that the major problems of patients in using removable partial dentures included oral pain, the feeling of embarrassment, and difficulty in chewing (3).

Mamdouh et al compared the effect of two treatment options in mandibular Kennedy Class I cases with respect to OHRQoL and bite force, RPDs retained either by precision attachment (PA-RPD) or clasps (C-RPD). It was concluded that the OHRQoL was comparable after 12 months and that the bite force was the same for both treatment cases (17).

The results of this study were in contrast to those obtained by Forgie et al who had assessed the quality of life parameters in edentulous individuals who were treated with complete dentures by students in England and Scotland. Discrepancies in the results of different studies can be explained by cultural and racial differences and the socio-economic status of patients, which can affect their expectations and satisfaction (18).

### Conclusion

Based on the results obtained in the present study, the quality of life in people who had a complete denture was higher than those with a partial denture. Moreover, people who used removable partial dentures in the mandible had a lower quality of life than others. It can be concluded that a longer duration of denture use can increase people's quality of life.

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### Author Contributions

**Conceptualization:** Kosar Dadgar, Maryam Zamanzadeh.

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All authors read the manuscript and approved the final version of the manuscript.

### Conflict of Interests

None.

### Ethical Approval

The study protocol was approved by the Ethics Committee in the School of Dentistry in Mazandaran University of Medical Science, Sari, Iran (IR.MAZUMS.IEC.1398.5674).

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