Mustansiria Dental Journal

MDJ

DOI:https://doi.org/10.32828/mdj.v20i1.997

Vol.20, No.01, 06/2024

P- ISSN: 2618-0944

E- ISSN: 1813-850

Impact of Periodontal Health Status on the Oral Health Related Quality of Life in Sulaimani City by Using Oral Health Impact Profile

Osamah Assim Abdulrahman Algodi[1], Aram Mohammed Hamad[2]

[1]HDD student, Periodontics Department, College of Dentistry / University of Sulaimani, Madam Mitterrand Street, Sulaimania, Iraq, E-mail: Osamah.algodi@gmail.com, Phone Number: +9647730481326

[2]BDS, MSc, PhD, head of the department of periodontics at the college of dentistry/ Sulaimani University, E-mail: aram.hamad@univsul.edu.iq.

Received 12/01/2024 ***Accepted in revised form 02/05/2024*** ***Published 30/06/2024***

Abstract

Aim: The objective of this study is to provide a valid and reliable Kurdish translation of the Oral Health Impact Profile-14 (OHIP-14) and to find the impact of periodontal health status on oral health related to quality of life (OHRQoL).**Method:** OHIP-14 was translated and checked for validity and reliability during the pilot study which involved 39 participants. After validation of the newly translated Kurdish version of OHIP-14, 323 individuals participated in this questionnaire-based cross-sectional study which involved documentation of their demographics and periodontal clinical parameters for all participants by the researcher using William's periodontal probe. The questionnaire form was filled in by the participants themselves. **Results:** Among participants, the total mean of OHIP-14 and the mean values of all subscale scores significantly increase with worsening of periodontal diseases ($P \leq 0.05$), except for psychological discomfort, and physical disability. It was found that there was a statistically significant strong positive correlation between periodontal parameters (PI, BI, PPD, and CAL) and quality of life ($p<0.0001$).**Conclusion:** Based on the study's findings, it can be inferred that periodontal diseases pose negative impacts on the quality of life (QOL), with a more pronounced effect observed in participants suffering from severe periodontal diseases.

Keywords: OHRQoL, OHIP-14, Periodontal disease, Kurdish version.

Copyright © 202x, Mustansiria Dental Journal. This work licensed under a Creative Commons Attribution Noncommercial 4.0 International License

Introduction

Quality of life (QOL) entails what makes life worth living. It includes several constituents; safety and the environment are obvious examples, but health is also an important part [1,] the World Health Organization (WHO) has defined health as "a state of complete physical, mental and social well-being and not merely the absence of infirmity or disease", emphasizing a biopsychosocial model of health and illness[2].

Oral Health-Related Quality of Life (OHRQoL) is a multidimensional concept that includes biopsychosocial aspects of oral wellbeing[3]. Although the OHRQoL does not provide information about the individual's clinical oral status, it does provide an insight into their perception of their oral health and how it shapes their life[4].

The importance of OHRQoL comes from the fact that the effects of a disease are more dispersed than only the effect on a specific organ or system, but rather the subjective experience, personal values, attitudes, and beliefs that individuals have concerning their personal perspective of health[5].

Among the evaluation instruments of the effect of OHRQoL, one of the most popular in different cultures and sociodemographic profiles, is the Oral Health Impact Profile (OHIP), which was proposed in Australia[6], to assess dysfunction, discomfort, and disabilities caused by oral conditions. The data aims to supplement traditional measures of oral health, providing a more comprehensive picture of the impact of oral disease on populations and the effectiveness of health services in reducing these impacts[7].

OHIP-14, which showed good reliability, validity, and accuracy, consists of entries that are divided into seven dimensions: functional limitation, physical pain, physical disability, psychological discomfort, psychological disability, social disability, and handicap[5]. OHIP-14 gained widespread adoption across the globe for various research purposes with modifications including language and regional issues. Assessing the quality of life of adult oral health is one of its primary needs[8].

Periodontal disease is caused by an imbalance between the oral biofilm in the dento-gingival area and the host response. This imbalance causes a loss of supporting periodontal tissue and alveolar bone[9]. Several clinical studies were keen on the management of the disease in terms of etiology, pathogenesis, efficacy, and outcome of different treatment modalities. The emphasis has been on clinical periodontal parameters such as probing depth (PD) and attachment level, and most studies have used a site perspective rather than an individual perspective[10]. The period of periodontal therapy is often lengthy, and it involves treatments that can inflict some discomfort. It has been a concern that periodontal therapy may not be so effective when the outcome is regarded from the patient's perceptions[11]. Periodontal therapy is considered to have a positive impact on the QoL of patients. However, evidence to support the effect of periodontal therapy on

QoL is still limited[12]. Individual attitudes are dynamic, change over time and experience, and are modified by phenomena like coping, expectancy, and adaptation[13].

To assess quality of life, we can use OHIP-14 which reflects comfort in eating, sleeping, social interaction, positive image, and satisfaction with oral health[14]. Knowing how the disease affects the patient's QOL might help us understand what they go through, improve public dental health programs, and improve the oral care media messages to increase reach and awareness. Slade and Spencer have expected that assessments of oral health conditions may also be used to promote oral health, especially when trying to secure public funds for oral health care[15].

The uptake of appropriate oral hygiene practices is related to the degree of awareness and knowledge the individual has about oral health care and periodontal diseases. The rise of good oral care practices in developed nations has been associated with lower prevalence of periodontitis[16]. A previous study revealed inappropriate levels of oral hygiene and periodontal disease awareness and knowledge in the Iraqi population[17].
We still have a gap in understanding how periodontal disease affects the population in Sulaimani City from the patient's perspective, this information gives a better understanding of how the disease affects patients and what drives them to seek treatment, it might also help in updating the primary health center's dental protocols to make them more patient-focused.

The worse the periodontal disease, the more it affects the OHRQoL according to many research till the writing of this article, a Kurdish version of the OHIP-14 has never been used or presented regarding periodontal disease or any other field of dentistry. Therefore, the purpose of the study is to assess the impact of periodontal diseases on the quality of life among the adult population of Sulaimani city, Kurdistan, and Iraq.

Materials and Methods

After ethical clearance was acquired from the ethics committee at the College of Dentistry/University of Sulaimani (no.175/23). The study took place at the College of Dentistry/University of Sulaimani for a period of six months. Those involved in the study were receiving medical treatment at the periodontal department clinics at the College of Dentistry/University of Sulaimani. All participants were given a Participant Information Sheet (PIS), and those who agreed to sign were included in the study. Out of the 483 individuals that have been approached, 323 agreed to participate and signed the PIS.

The study's inclusion criteria comprise individuals aged 20 years or older who express a willingness to participate and have a minimum of 20 natural teeth. Exclusion criteria were pregnancy, lactating women, systemic disease, and edentulism, dental conditions other than a periodontal disease, taking antibiotics during the last 3 months, illiteracy, mental disease, crowns, and implants.

The sample size calculation was performed using the G-power sample size calculator at 95% power. The required sample size for the present research was 280 individuals.

Participants were divided according to periodontal condition into four groups:
Group 1 (control) participants have a clinically healthy gingiva: bleeding < 10%, Group 2 (Gingivitis) which includes participants with gingivitis: bleeding ≥ 10%, Group 3 (stages I and II periodontitis) and Group 4 (stages III and IV periodontitis).
Participants were also grouped according to age into three groups: group 1 for ages between 20 and 35, group 2 for ages between 35 and 50, and group 3 for ages between 50 and 65.
Comparisons between groups were done based on total OHIP-14 scores.
Data collection was done by using individual case sheets and clinical recordings. The case sheet is divided into three sections; the initial section comprises sociodemographic variables. The subsequent section entails the clinical examination, while the final part focuses on the measurement of OHRQoL. The sociodemographic variables included age, sex, brushing frequency, interdental cleaning aids, use of mouthwash, and smoking habits.

Periodontal condition is assessed by measuring the periodontal clinical parameters such as O'Leary Plaque Index (percentage), gingival bleeding index (GBI) (percentage), probing depth (the deepest point in mm for each patient), and clinical attachment loss CAL (the point of the most attachment loss in mm was considered), and Miller's mobility index. Using William's periodontal probe, for each participant to perform a thorough periodontal examination under appropriate illumination. Patients exhibiting inter-dental attachment loss ≥ 2 non-adjacent teeth are supposed to be periodontitis cases, while those without inter-dental attachment loss but showing bleeding on probing ≥ 10% will be classified as gingivitis cases.

The severity of periodontitis is classified according to the 2017 classification of periodontal and peri-implant diseases and conditions:

Stage I periodontitis: Interdental CAL 1-2 mm at ≥ 2 non-adjacent teeth.

Stage II periodontitis: Interdental CAL 3-4 mm at ≥ 2 non-adjacent teeth.

Stage III and IV periodontitis: Interdental CAL ≥ 5 mm at ≥ 2 non-adjacent teeth.

The third section consists of a questionnaire that includes OHIP-14 (Figure 1) to assess OHRQoL. Both an English version and a Kurdish version of the questionnaire were provided for the participants. Questions were answered on a five-point Likert scale[21](0=never, 1=hardly ever, 2=occasionally, 3=fairly often, 4=very often), It consists of 7 domains with 2 questions in each domain. Each question carries a minimum score of 0 and a maximum score of 4 and has a total score of 56. Thus, a lower score will indicate a better oral health-related quality of life.

The Kurdish version of OHIP-14 was created through a rigorous process. Initially, the translation and back translation of OHIP-14 were conducted by experts proficient in both Kurdish and English. The questionnaire then underwent face and content validation to ensure its accuracy and relevance. Based on the valuable inputs proposed by the experts during content

validation, slight adjustments were made to the wording of the questionnaire to improve the level of understanding (Figure 1).

Subsequently, the pilot study was conducted on 39 participants. The questionnaires were administered to the participants at the University of Sulaimani/College of Dentistry through face-to-face interviews as part of the pilot study testing, then. Their information was then used to test reliability of the newly developed Kurdish version of the OHIP-14, the participants were asked to refill the Kurdish version of the OHIP-14 two weeks after the first time.

Statistical analysis was performed using IBM® SPSS® version 25 64-bit edition, the newly fabricated Kurdish version of OHIP-14 was checked for reliability through test-retest reliability with correlation coefficient > 0.7, Shapiro-wilk test was used to check normality and the data turned out to be not normally distributed $P<0.05$, Kruskal-Wallis test was used to check statistical significance between groups, Spearman's correlation used determine correlation between non-normally distributed data.

Results

As a result, the data were analyzed from 323 participants out of 483 approached individuals. The demographic features of the individuals are demonstrated in Table 1, which were 41% males, and 59% females. 47% were aged between 20-35, and 31% were in the 36-50 age range, the remaining 22% were in the 51-65 age range. Approximately 80% of the participants did not smoke, with the remaining 20% being smokers. 48% of the individuals brushed once daily, 25% twice, and 27% brushed irregularly. The overall percentage of the participants who did not use mouthwash and dental floss was 71% and 62%, respectively.

Regarding OHIP-14 and demographic characteristics, there was no statistical difference between the sexes or between those patients who used mouthwash and those who did not ($P\geq 0.05$) (Table 1).

The reliability, and validity of the pilot questionnaire of the Kurdish version of the OHIP-14 were assessed, and a good result was obtained since its value was more than 0.7 indicating high internal consistency of the OHIP-14.

The OHRQL was measured using the OHIP-14 questionnaire, which consists of 7 domains with 2 questions in each domain (Figures 1 and 2). Each question carries a minimum score of 0 and a maximum score of 4 and has a total score of 56.

DOI: https://doi.org/10.32828/mdj.v20i1.997

Factor		Group								OHIP-14			Spearman correlation
		1	*(N=77)*	*2*	*(N=132)*	*3*	*(N=101)*	*4*	*(N=13)*	N	Mean	SD	
Smoking	Yes	11	14%	39	30%	36	36%	6	46%	64	23.4*	12.5	moderate positive correlation
	No	66	86%	93	70%	65	64%	7	54%	259	15.9*	10.9	
Age	20-35	77	100%	76	58%	0	0%	0	0%	153	9*	7.6	strong positive correlation
	35-50	0	0%	50	38%	44	44%	5	38%	99	21.4*	8.9	
	50-65	0	0%	6	4%	57	56%	8	62%	71	28.5*	8.1	
Sex	Male	35	45%	47	36%	45	45%	7	54%	134	17.3	11.9	non-significant correlation
	Female	42	55%	85	64%	56	55%	6	46%	189	16.9	11.1	
Brushing habits	Once	31	40%	79	60%	39	39%	7	54%	156	17.1*	11.1	Strong negative correlation
	Twice	41	53%	30	23%	11	11%	0	0%	82	9.7*	10.3	
	Irregular	5	7%	23	17%	51	50%	6	46%	85	24.2*	8.3	
Mouthwash	Yes	23	30%	49	37%	15	15%	7	54%	94	15.2	11.3	weak negative corelation
	No	54	70%	83	63%	86	85%	6	46%	229	17.9	11.4	
Flossing habits	Yes	44	57%	31	23%	44	44%	3	23%	122	16.1*	12.7	weak negative relation
	No	33	43%	101	77%	57	56%	10	77%	201	17.7*	10.6	

Table 1: Total numbers and percentages of the demographic characteristics, mean, and standard deviation of OHIP-14, with the relation between factors and OHIP-14

*Spearman's correlation Significant P≤ 0.01

Clinical parameter	Group 1		Group 2		Group 3		Group 4	
	Mean%	SD	Mean%	SD	Mean%	SD	Mean%	SD
Plaque Index	29.6100	6.2450	66.8000	12.4610	85.5100	7.7120	92.0000	6.8920
Bleeding Index	6.0600	2.1140	43.7300	13.5830	69.3400	11.1390	87.8500	3.6930
Probing Pocket Depth	0.0000	0.0000	2.6800	0.4680	6.2000	0.7620	8.0800	0.4940
Clinical Attachment Loss	0.0000	0.0000	0.0000	0.0000	3.3600	0.7010	9.0800	1.2560
Gingival Recession	0.0000	0.0000	0.0000	0.0000	1.1200	0.3250	1.3100	0.4800

Table (2) : clinical parameters according to the groups

Domain	Questions	Score				
		Never	Hardly ever	Occasionally	Fairly often	Very often
		0	1	2	3	4
Functional limitation	1) Have you had trouble pronouncing any words because of problems with your gums?					
	2)Have you felt that your sense of taste has worsened because of problems with your gums?					
Physical limitation	3)Have you had painful aching in your mouth due to gum problems?					
	4)Have you found it uncomfortable to eat any foods because of problems with your gums?					
Psychological discomfort	5)Have you been worried by gum problems?					
	6)Have you felt tense because of problems with your gums?					
Physical disability	7)Has your diet been unsatisfactory because of problems with your gums?					
	8)Have you had to interrupt meals because of problems with your gums?					
Psychological disability	9)Have you found it difficult to relax because of problems with your gums?					
	10)have you been a bit embarrassed because of problems with your gums?					
Social Disability	11)have you been a bit irritable with other people because of problems with your gums?					
	12)Have you had difficulty doing your usual jobs because of problems with your gums?					
Handicap	13)Have you felt that life in general was less satisfying because of problems with your gums?					
	14)Have you been totally unable to function because of problems with your gums?					

Figure 1(B): English version of OHIP-14

OHIP – 14					
بەبەردەوامی	زۆرجار	ناوەناو	کەمجار	هەرگیز	
					1. کێشەت هەبوە بۆ وتنی هەر وشەیەک بە هۆی کێشەی یووکتەوە؟
					2. هەستت بە خرایبون وتێکچونی تام و چێژ کردوە بە هۆی کێشەی یووکتەوە؟
					3. ئێش و ئازاری ناو دەمت هەیە بەهۆی کێشەی یووکتەوە؟
					4. بۆت دەرکەوتوە ناڕەحەتیت لە خواردنی هەر خواردنێک بە هۆی کێشەی یووکتەوە ؟
					5. ئایا هەستت بە قەلەقی (دوودڵی)کردوە بە هۆی کێشەی یووکتەوە؟
					6. هەستت بە گرژی و بێزاری کردوە بە هۆی کێشەی یووکتەوە؟
					7. ئایا توشی کێشە بوویت لە کاتی خواردندا بە هۆی کێشەی یووکتەوە؟ ئایا ناڕازیت لە خۆراکەکەت بە هۆی کێشەی یووکتەوە؟
					8. ئایا ناچار بوویت دەست هەڵگریت لە زەمەکانت بە هۆی کێشەی یووکتەوە؟
					9. ئایا کێشەت هەبوە لە پشودانت بەهۆی کێشەی یووکتەوە؟
					10. ئایا توشی شەرمەزاری بوویت بە هۆی کێشەی یووکتەوە؟
					11. ئایا توشی ناڕامی بویت لەگەڵ کەسانی دەوروبەرت بە هۆی کێشەی یووکتەوە؟
					12. گرفتت هەبوە لە ئەنجامدانی ئیشی ڕۆژانەت بە هۆی کێشەی یووکتەوە؟
					13. هەستت کردوە بە گشتی لە ژیان کەمتر ڕازیبیت بە هۆی کێشەی یووکتەوە؟
					14. ئایا وات لێهاتوە بە تەواوی نەتوانی کاربکەیت بە هۆی کێشەی یووکتەوە؟

Figure 1(A): Kurdish version of OHIP-14

Table 3: illustrates the distribution of responses according to the items of OHIP-14. The impact of oral health on the quality of life of individuals was substantial, causing psychological discomfort, physical limitation, and psychological disability. Approximately two-thirds of the individuals assumed that they had psychological discomfort, and one-third of the patients perceived physical limitation and psychological disability fairly often. In other words, they were worried and found it uncomfortable to eat their food properly, or a bit embarrassed because of problems with their gums. The impact on the domain of handicap was less prevalent. The prevalence of negative impact across all domains (very often), an option that is the least selected, varied between 0.0% and 12%.

Table 3: Distribution of responses to individual OHIP-14 domains

Domain	Never	Hardly ever	Occaisionally	Fairly often	Very Often
Functional limitation	246 (76%)	21 (7%)	43 (13%)	9 (3%)	4 (1%)
	82 (25%)	77 (24%)	124 (38%)	40 (13%)	0 (0%)
Physical limitation	59 (18%)	102 (32%)	120 (37%)	39 (13%)	1 (0%)
	33 (10%)	104 (33%)	98 (30%)	71 (22%)	17 (5%)
Psychological discomfort	34 (11%)	61 (19%)	82 (25%)	108 (33%)	38 (12%)
	96 (30%)	68 (21%)	56 (18%)	95 (29%)	8 (2%)
Physical disability	121 (38%)	55 (17%)	73 (23%)	66 (20%)	8 (2%)
	149 (46%)	59 (18%)	94 (29%)	21 (7%)	0 (0%)
Psycological disability	150 (46%)	108 (33%)	42 (13%)	23 (8%)	0 (0%)
	87 (27%)	51 (16%)	79 (24%)	82 (26%)	24 (7%)
Social Disability	108 (33%)	53 (16%)	103 (33%)	39 (12%)	20 (6%)
	176 (54%)	99 (31%)	43 (13%)	5 (2%)	0 (0%)
Handicap	137 (42%)	61 (19%)	96 (30%)	28 (9%)	1 (0%)
	221 (68%)	87 (27%)	14 (4%)	2 (1%)	0 (0%)

The total mean of OHIP-14 significantly increases with increasing the severity of periodontal diseases (2.42 ±1.3, 15.41 ±5.1, 27.58 ±6.3, and 39.46 ±2.8), respectively ($P \leq 0.001$), as shown in Figure 2.

The mean values of all subscale scores (functional limitation, physical limitation, psychological discomfort, physical disability, psychological disability, social disability, and handicap) significantly differed by periodontal disease severity, i.e, the mean values of all subscale scores significantly increased with the increasing severity of periodontal diseases ($P \leq 0.05$). This suggests that the severity of periodontal diseases has a major influence on people's quality of life.

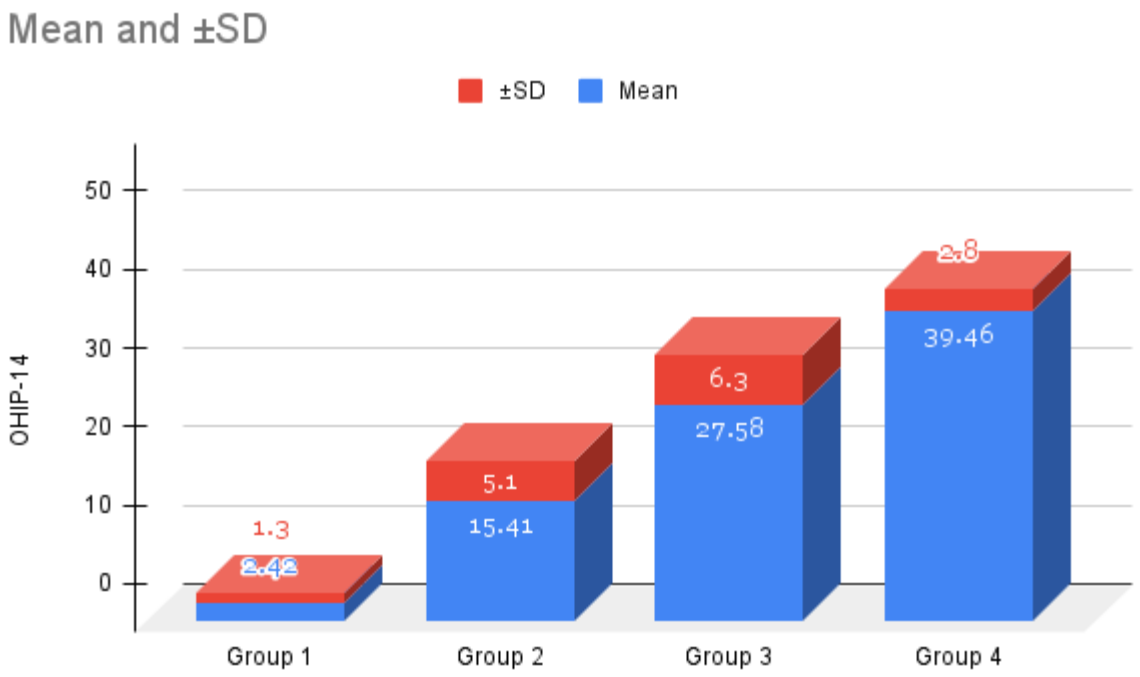

Figure 2: Mean and Standard deviation according to groups

The Kruskal-Wallis test uses these average ranks to assess whether there's a statistically significant difference in the way the data from each group is distributed.

The table compares the average rank of groups for Gingivitis, Stage1,2 Periodontitis, Stage 3,4 Periodontitis, and Control. The higher the average rank, the more severe the gum disease.

Table 4: Groups, mean OHIP-14, and their average rank

Group	Mean OHIP-14	Average Rank
Control	2.42	39.08
Gingivitis	15.41	150.73
Stage 1,2 periodontitis	27.58	250.91
Stage 3,4 periodontitis	39.46	313.69

*Kruskal-Wallis test

The result of Kruskal-Wallis test indicates that there is a significant difference in OHIP-14 between groups, which means that periodontal disease affects the QoL of patients, with a P value of (0.000), while Table 4 shows that the control group has the lowest average rank (39.08) which indicate a better QoL, while group 4 has the highest rank (313.69) indicating the worst QoL, All pairwise comparisons between groups are statistically significant (p-value < 0.05), except for the comparison between stage 1, 2 periodontitis and stage 3, 4 Periodontitis (p-value =

0.022). This suggests that all groups have statistically different average ranks except for stage 1, 2 Periodontitis and stage 3, 4 Periodontitis which appear to have similar average ranks.

Overall, the results suggest that there is a statistically significant difference in the sample average rank between at least two of the groups for Gingivitis, Stage 1, 2 Periodontitis, and Stage 3, 4 Periodontitis. However, there is no statistically significant difference between Stage 1, 2 Periodontitis and Stage 3,4 Periodontitis.

Table 5: pairwise comparison for Kruskal-Wallis test using Dunn's test.

Pairwise Comparisons	Test Statistic	Std. Error	Adj.Sig.
Control-Gingivitis	-111.657	13.382	0
Control-Stage 1,2 Periodontitis	-211.833	14.118	0
Control-Stage 3,4 Periodontitis	-274.614	27.982	0
Gingivitis-Stage 1,2 Periodontitis	-100.176	12.337	0
Gingivitis-Stage 3,4 Periodontitis	-162.957	27.127	0.135
Stage 1,2 Periodontitis-Stage 3,4 Periodontitis	-62.781	27.498	1

* Table 5 displays the pairwise comparisons between the groups Gingivitis, Periodontitis, Stage 3, 4 Periodontitis, and Control. The test statistics are reported in the 'Test Statistic' column, which is a chi-square statistic. The 'Std. Error' column shows the standard error. 'Adj.Sig.' refers to the adjusted significance level after applying the Bonferroni correction.

Table 6 demonstrated a correlation between the domain scores and parameters, such as sex, smoking habits, brushing, use of mouthwash, flossing, and periodontal parameters (Table 6). It was found that there was a statistically significant, strong positive correlation between periodontal parameters (PI, BI, PPD, and CAL) and quality of life ($p<0.0001$). Smoking and tooth mobility significantly weakly positively correlated with the domains. Brushing and flossing significantly weakly negatively correlated with the domains. Nevertheless, there was no significant correlation between sex and domain scores on one side, between the use of mouthwash and psychological discomfort, social disability, and the handicap subcategory ($p \geq 0.05$) on the other side. Additionally, all clinical parameters significantly affected the scores of all domains, along with the total Ohip-14 ($p < 0.0001$). This suggests that higher values of PI, GI, PD, and CAL are correlated with even more unfavorable effects of periodontitis on OHRQoL (Table 6).

Table 6: Spearman's correlation between variables (demographics, clinical parameters) and the domains.

Variable	Functional limitation (r)	Physical limitation (r)	Psychological discomfort (r)	Physical disability (r)	Psychological disability (r)	Social Disability (r)	Handicap (r)
Sex	0.01	0.004	0.02	0.02	-0.005	-0.11	-0.32
Smoking habits	0.25*	0.15*	0.15*	0.16*	0.16*	0.1*	0.15*
Brushing frequency	- 0.37*	-0.35*	- 0.28*	-0.35*	-0.39*	-0.22*	-0.28*
Use of mouthwash	- 0.15*	-0.11*	-0.06	-0.11*	-0.115*	-0.26	-0.052
flossing habit	-0.19*	-0.17*	-0.18*	-0.15*	-0.14*	-0.17*	-0.13*
Presence of tooth mobility	0.44*	0.41*	0.41*	0.47*	0.38*	0.37*	0.41*
Plaque Index	0.66*	0.61*	0.67*	0.70*	0.63*	0.61*	0.56*
Bleeding index	0.67*	0.63*	0.66*	0.71*	0.63*	0.63*	0.61*
Probing Pocket Depth	0.67*	0.64*	0.68*	0.74*	0.64*	0.67*	0.66*
Clinical Attachment Loss	0.59*	0.53*	0.63*	0.71*	0.47*	0.55*	0.62*

* Correlation is significant at the 0.01 level

Discussion

For many years, people have known that periodontal disease is common, and this has led to a greater focus on the importance of periodontal care[18]. Despite notable improvements in preventing and treating various oral health problems, such as tooth decay, periodontal disease persists as a major problem and there is little evidence that the severity of periodontal disease has improved in recent years[19].

There have been many studies that have investigated the impact of periodontal disease on OHRQoL. However, it is difficult to compare the results of these studies because they have used different methods to define periodontal status and assess OHRQoL[20].

Different scales may have different advantages and disadvantages depending on the purpose and context of the study. A validated OHIP-14 questionnaire was employed to evaluate the impact of periodontal disease on QoL. For it may be more suitable for screening and comparing populations, and it is the most dependable, sensitive even for little changes, and has demonstrated sufficient cross-cultural consistency [(21)]. Furthermore, the majority of studies have employed this measuring tool for evaluating the adverse effect of oral conditions on comfort or well-being [(22)]. Likert scale was utilized in this study due to its ease of incorporation into the study and its ability to measure the intensity or degree of agreement or disagreement with a question or statement rather than a yes or no answer, Likert scale also gives us the ability to perform different statistical test with ease.

Although the OHIP-14 which was first established to quantify OHRQoL in relation to various oral diseases, has been translated, validated, and implemented in many countries like the United States, Scotland, Canada, and to many languages such as Greek, Arabic, Hindi, Brazilian, Spanish and many others. Scarce information on how oral health problems affect the quality of life of the Kurdish people. Therefore, this study tried to evaluate how periodontal diseases influence the quality of life of the Kurdish population.

The OHIP-14 measure was translated into Kurdish and demonstrated to be valid and reliable. Cronbach's alpha for the OHIP-14 was more than 0.7. The reliability and validity were satisfactory for all domain subscales. Generally, periodontal diseases had an undesirable influence on QoL. Translating the OHIP-14 into the Kurdish language enables the researcher to collect data from different communities within the population instead of being restricted to a population that understands the English language or filling the questionnaire themselves, it also gives researchers the capacity to expand their research sample in the future. The method used to check validity and reliability in this study is close to what has been used in Saudi Arabia.

The current study shows a total mean OHIP-14 score of (17.09 ± 11.9), proposing a substantial impact of oral health status on the quality of life (QoL) of individuals. This could be explained by the fact that the participants are patients looking for help from a specialized dental hospital and are suffering from periodontal disease, which necessitated their initial visit. Compared to hospital-based research, a well-designed population-based survey can give a more accurate picture in contrast to the studies conducted in the Shanghai [(23)] population and Saudi Arabia [(24)], which showed a high

mean OHIP score (10.8 and 13.92), respectively.

As shown in Table 1, smokers have a significantly higher mean OHIP-14 score in comparison to nonsmokers, which can be explained by the effect of smoking on the periodontal condition, which results in less patient satisfaction with their QOL. Participants who reported flossing or brushing their teeth twice a day had lower OHIP-14 scores than those who reported brushing once a day or infrequently, suggesting that patients who take good care of their oral hygiene have higher overall OHRQoL scores.

The effect of oral health on the QOL of the individuals in the current research suggests that their dental health status had an impact on their QoL in one or more additional ways. especially scores of "fairly often" or "very often" in OHIP-14 subscales. The QoL plays a vital role in studying effective oral health status in the community. Approximately two-thirds of the participants assumed that they had psychological discomfort fairly often because they were worried and felt tense because of a problem with their gums. One-third of the patients perceived physical limitation and psychological disability fairly often. Because they had painful aches, found it uncomfortable to eat their food properly, or found it difficult to relax, and were a bit embarrassed because of problems with their gums. These results draw attention to the fact that periodontal diseases affect daily life activities as well as the overall QOL [25]

The total mean of OHIP-14 significantly increases with increasing severity of periodontal diseases, and the mean values of all subscale scores (functional limitation, physical limitation, psychological discomfort, physical disability, psychological disability, social disability, and handicap) significantly differ by periodontal disease severity. This can be explained by the impact of periodontal diseases on the worsening of OHRQoL. This can be explained by the fact that clinical symptoms such as gingival recessions, bleeding when brushing teeth, gingival redness and swelling, tooth mobility, pathological tooth migration, or recurrent halitosis are caused by dysfunctions of the stomatognathic system, as well as a red complex. These symptoms should only be linked to periodontal disease; therefore, in observational studies, they should be controlled by considering a variety of local factors that may distort them, e.g., dental caries, mouth and facial pain, increased tooth sensitivity, or the loss of tooth functionality and severe tooth loss [26] These results go on par with results from other studies in somewhat similar countries [27-29].

Several studies have shown that there is a correlation between the severity of periodontal disease and OHRQoL[20,30,31]. However, the impact of periodontal disease on OHRQoL in the Kurdish population has not yet been thoroughly studied.

A significant positive relationship was found between all subdomains of the OHIP-14 and PI, BI, PPD, and CAL which considered the clinical signs and symptoms of periodontal diseases. Therefore, by increasing the value of PI, BI, PPD, and CAL, there will be an increase in the severity of periodontal diseases, which will cause an increase in the value of subdomains of OHRQoL. Thus, psychological disability (embarrassment, difficulty in being relaxed),

physical limitation (difficulty in toothbrushing and eating), functional limitation (trouble in pronouncing, worsening sense of taste), psychological discomfort (worried, and feeling tense), physical disability (unsatisfactory diet, interrupting meals), social disability (irritability with others and difficulty doing the usual job), and handicap (less satisfying life and being unable to function) subdomains of OHRQoL will increase by increasing the value of clinical signs and symptoms of periodontal diseases. This indicates the majority of problems experienced by periodontal patients that go unobserved during therapy. This demonstrates the need for even more comprehensive planning as regards periodontal treatment goals [32].

Studying the effects of periodontal disease on OHRQoL in Kurdistan and Iraq is fairly new with much more work to be done, this study was conducted on individuals who are seeking treatment at the periodontal department clinics in Sulaimani, we still need to study the effect of periodontal disease on the QOL of subjects that are not seeking treatment or even unaware of their disease condition. On the other hand, the sample size needs to be expanded to involve more Kurdish cities and populations. Furthermore, studies need to be performed on the effect of periodontal disease on OHRQoL with OHIP-14 or even using other OHRQoL scales.

From the results of this study, we can assume that periodontal disease has a negative effect on the QOL, but the gradual nature of the disease progression over a long period of time may cause the symptoms to go unnoticed by the patients for quite some time, and it appears that providing knowledge about the signs and symptoms of the disease might help in increasing awareness among the general population.

Conflict of interests

The authors report no conflict of interest related to this study.

Acknowledgments

I would like to extend my deepest appreciation to everyone in the department of periodontology, especially my supervisor and mentor Dr. Aram Mohammed Hamad for his continuous guidance which made this article possible, I also would like to thank Dr. Arass J. Noori for his help in performing the statistical analysis for this article. I would also like to thank my better half Dr. Nuha Shukri for her support and inspiration.

References

1 .John MT. Foundations of oral health-related quality of life. Journal of Oral Rehabilitation. 2021;48(3):355–9.

2. WHO | Basic documents [Internet]. [cited 2023 Jul 25]. Available from: https://apps.who.int/gb/bd/

3.Locker D, Allen F. What do measures of “oral health-related quality of life” measure? Community Dent Oral Epidemiol. 2007 Dec;35(6):401–11.

4.Teoli D, Bhardwaj A. Quality Of Life. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 [cited 2023 Jul

25]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK536962/

5.Yfantopoulos J. The oral health related quality of life in different groups of senior citizens as measured by the OHIP-14 questionnaire. Oral Biology and Dentistry [Internet]. 2015 Jan 1 [cited 2022 Dec 9]; Available from: https://www.academia.edu/47009480/The_oral_health_related_quality_of_life_in_different_groups_of_senior_citizens_as_measured_by_the_OHIP_14_questionnaire

6.Slade GD. Derivation and validation of a short-form oral health impact profile. Community Dent Oral Epidemiol. 1997 Aug;25(4):284–90.

7.Sischo L, Broder HL. Oral Health-related Quality of Life. J Dent Res. 2011 Nov;90(11):1264–70.

8.Papagiannopoulou V, Oulis CJ, Papaioannou W, Antonogeorgos G, Yfantopoulos J. Validation of a Greek version of the oral health impact profile (OHIP-14) for use among adults. Health Qual Life Outcomes. 2012 Jan 14;10:7.

9. Könönen E, Gursoy M, Gursoy UK. Periodontitis: A Multifaceted Disease of Tooth-Supporting Tissues. J Clin Med. 2019 Jul 31;8(8):1135. doi: 10.3390/jcm8081135. PMID: 31370168; PMCID: PMC6723779.

10.Jansson H, Wahlin Å, Johansson V, Åkerman S, Lundegren N, Isberg PE, et al. Impact of periodontal disease experience on oral health-related quality of life. J Periodontol. 2014 Mar;85(3):438–45.

11.Saito A, Hosaka Y, Kikuchi M, Akamatsu M, Fukaya C, Matsumoto S, et al. Effect of initial periodontal therapy on oral health-related quality of life in patients with periodontitis in Japan. J Periodontol. 2010 Jul;81(7):1001–9.

12. Shanbhag S, Dahiya M, Croucher R. The impact of periodontal therapy on oral health-related quality of life in adults: a systematic review. J Clin Periodontol 2012; 39: 725–735. doi: 10.1111/j.1600-051X.2012.01910.x.

13.Allen PF. Assessment of oral health related quality of life. Health Qual Life Outcomes. 2003 Sep 8;1:40.

14.Campos LA. Use of Oral Health Impact Profile-14 (OHIP-14) in Different Contexts. What Is Being Measured? International Journal of Environmental Research and Public Health [Internet]. 2021 Dec [cited 2022 Nov 30];18(24). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8703465/

15. Goode, JS (2020). Improving access to dental services and promoting oral health for adults experiencing homelessness in a non-capital city area of Victoria : a multi methods study. University of Tasmania. Thesis.
https://doi.org/10.25959/23250416.v1

19.Kandelman D, Arpin S, Baez RJ, Baehni PC, Petersen PE. Oral health care systems in developing and developed countries. Periodontol 2000. 2012 Oct;60(1):98–109.

16.Abdulbaqi HR, Abdulkareem AA, Alshami ML, Milward MR. The oral health and periodontal diseases awareness and

knowledge in the Iraqi population: Online-based survey. Clin Exp Dent Res. 2020 Oct;6(5):519–28.

17.Papapanou PN, Sanz M, Buduneli N, Dietrich T, Feres M, Fine DH, et al. Periodontitis: Consensus report of workgroup 2 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. Journal of Periodontology. 2018 Jun 21;89:S173–82.

18. Liss A. Evidence-based dental hygenist practice in the non-surgical therapy of patients with periodontitis: outcomes of therapy and factors associated with the quality of care. 2022 Apr 5.

19. Kinane DF, Stathopoulou PG, Papapanou PN. Periodontal diseases. Nature reviews Disease primers. 2017 Jun 22;3(1):1-4.

20.Lopes MWF, Gusmão ES, Vasconcelos Alves R, Cimões R. The impact of chronic periodontitis on quality of life in Brazilian subjects. Acta Stomatologica Croatica. 2009 Jan 1;43:89–98.

21. Gera A, Cattaneo PM, Cornelis MA. A Danish version of the oral health impact profile-14 (OHIP-14): translation and cross-cultural adaptation. BMC oral health. 2020 Dec;20:1-7.

22. da Silva Araújo AC, Gusmão ES, Batista JEM, et al. Impact of periodontal disease on quality of life. Quintessence Int 2010;41(6).

23. Liu L-J, Xiao W, He Q-B, et al. Generic and oral quality of life is affected by oral mucosal diseases. BMC Oral Health 2012;12(1):2.

24.HAKAMI, K. Y., INGLE, N. A., ASSERY, M. K. & ALSANEA, J. A. 2020. Use of the Arabic Version of Oral Health Impact Profile-14 to Evaluate the Impact of Periodontal Disease on Oral Health-related Quality of Life among Saudi Population. Journal of Oral Health and Community Dentistry, 14.

25.Ng SK, Leung WK. Oral health-related quality of life and periodontal status. Commun Dent Oral Epidemiol 2006;34(2):114–122.

26.PAŚNIK-CHWALIK, B. & KONOPKA, T. 2020. Impact of periodontitis on the Oral Health Impact Profile: A systematic review and meta-analysis. *Dental and Medical Problems,* 57**,** 423-431 34. Assery M, Ingle N, Alsanea J, Hakami K. Use of the Arabic Version of Oral Health Impact Profile-14 to Evaluate the Impact of Periodontal Disease on Oral Health-related Quality of Life among Saudi Population. Journal of Oral Health and Community Dentistry. 2020 Jul 15;14:27–31.

27.Yadav T, Chopra P, Kapoor S. Association between chronic periodontitis and oral health–related quality of life in Indian adults. Journal of International Oral Health. 2019 Sep 1;11(5):280.

28.Goergen J, Albandar JM, Oppermann RV, Rösing CK, Susin C, Haas AN. Periodontitis stage and grade are associated with poor oral-health-related quality of life: Findings from the Porto Alegre cohort study. J Clin Periodontol. 2021 Oct;48(10):1333–43.

29.Simona G, Silvia M, Carina B. Quality of Life Regarding Patients with Periodontal Disease in Iasi, Romania. Procedia - Social and Behavioral Sciences. 2014 Apr 22;127:15–20.

30.Cunha-Cruz J, Hujoel PP, Kressin NR. Oral health-related quality of life of periodontal patients. J Periodontal Res. 2007 Apr;42(2):169–76.

31.Bernabé E, Marcenes W. Periodontal disease and quality of life in British adults. J Clin Periodontol. 2010 Nov;37(11):968–72.

32. Paśnik-Chwalik B, Konopka T. Impact of periodontitis on the Oral Health Impact Profile: A systematic review and meta-analysis [published online as ahead of print on December 2, 2020]. Dent Med Probl. 2020;57(4). doi:10.17219/dmp/125028