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Research Article

Investigation of the Effect of Periodontal Disease Awareness on Quality of Life based on Oral Health Impact Profile-14 (OHIP-14) Questionnaire

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Abstract

Objective: The aim of the study is to examine the effects of individuals awareness of periodontal disease on the quality of life by applying the Oral Health Impact Profile-14 (OHIP-14) questionnaire in relation to sociodemographic data, oral hygiene habits, oral health awareness levels and personal periodontal disease risk assessment.

Materials and Method: 330 individuals who applied to Bülent Ecevit University Faculty of Dentistry Department of Periodontology were included in the study and the participants included the OHIP-14 questionnaire, a questionnaire containing sociodemographic information, oral hygiene habits questionnaire, dental background, questionnaire questioning periodontal awareness were used.

Results: The results show there was no statistically significant difference between the sociodemographic data and OHIP-14 ($p > 0.05$). Periodontal awareness parameters were found to vary according to demographic data. Smoking lowers the OHIP-14 score ($p < 0.05$). It was revealed that there is a significant relationship between age, gender, marital status and education levels and oral hygiene habits ($p < 0.05$). and the higher the education level was positively correlated with the frequency of going to the dentist. Although there is no statistical relationship between periodontal awareness questions and OHIP-14 ($p > 0.05$), 71,2% of the population that we examined do not know what causes tooth and gum diseases.

Conclusion: In the light of the results we have obtained, we think that individuals with poor awareness of periodontal disease may have a higher risk of disease and that awareness should be increased with written, visual and auditory methods.

Keywords: Periodontal Disease Awareness; OHIP-14; Periodontal Risk Analysis; Oral Hygiene Habits

Abbreviations:

WHO: World Health Organization; OHIP-14: Oral Health Impact Profile-14; OHRQoL: Oral Health Related Quality of Life; TL: Türkish Lira

Introduction

In the domain of public health research, quality of life has emerged as a pivotal and broadly accepted indicator, predicated on the evaluation of service needs and treatment outcomes. This concept encompasses numerous domains, including socioeconomic status, social relationships and psychological functioning. The synthesis of subjective and objective findings, in conjunction with the implementation of health-related quality of life scales, is imperative for the effective management of chronic diseases, including periodontal disease and the evaluation of treatment efficacy [1]. Patients' commitment to oral care, the treatment

method applied and regular dental check-ups are effective in improving oral health-related quality of life. Those with better periodontal condition, i.e. with minimal history of periodontal destruction, are more likely to have a better OHRQoL and vice versa [1]. OHRQoL also provides services such as determining treatment priorities, identifying service needs, interpreting the results of clinical studies and providing a useful economic assessment [2]. OHRQoL is a field that reveals individuals perceptions related to oral health and assessing the positive and negative effects of oral health on overall health status [3,4].

According to WHO reports, periodontal disease is considered one of the major chronic diseases worldwide. It has been reported that OHRQoL is significantly lower in populations with a high prevalence of periodontal disease [5]. It has also been stated that periodontal disease awareness plays a very important role in terms of quality of life and individual health [6]. In order to achieve a healthy periodontal condition, it is necessary to change the individual's behavior patterns under the guidance of periodontal awareness. The aim of this study is to examine the effect of individuals' periodontal disease awareness on their quality of life by administering the OHIP-14 questionnaire and correlating it with sociodemographic data, oral hygiene habits, dental history and oral health awareness questions.

Materials and Methods

Study Design and Participants

In this study, a survey was conducted involving 330 patients who applied to the Department of Periodontology at Bülent Ecevit University Faculty of Dentistry in order to examine the effect of periodontal disease awareness on quality of life using the OHIP-14 questionnaire.

Inclusion Criteria

1. Be literate
2. Be at least 18 years old
3. Not have undergone any periodontal treatment in the last 6 months
4. Not be pregnant or lactating
5. Not have a history of chemotherapy/radiotherapy
6. Have been informed about the procedures to be performed before the study and have given their written consent

Exclusion Criteria

1. Individuals under medical supervision having any illness that could negatively affect the survey results
2. Patients not attending their follow-up appointments
3. Incomplete survey responses

Ethical Approval

The study protocol was prepared in accordance with the principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Non-Interventional Clinical Research Ethics Committee of Zonguldak Bülent Ecevit University, under approval number 2019/04. Consent forms detailing the procedures to be performed prior to the operation were provided and patients were informed about the procedures to be performed.

Data Collection

The presence or absence of periodontal disease awareness and sociodemographic data, the OHIP-14 scale, oral hygiene habits, dental history, were used in calculating the number of samples required for the study and determining the study. The survey validated and verified by Mumcu and colleagues in 2006 was used for the OHIP-14 [7]. All evaluations were performed by the same dentist.

Data Analysis

The power analysis determined that the minimum sample size required was 327. The data were analyzed using IBM SPSS V23. The normality of distribution was examined using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The chi-square test was used to compare categorical variables between groups. The independent two-sample t-test was used to compare normally distributed data between two groups and the Mann-Whitney U test was used to compare non-normally distributed data. For comparing normally distributed data in three or more groups, one-way analysis of variance was used and for comparing non-

normally distributed data, the Kruskal-Wallis test was used. Pearson's correlation coefficient was used to examine the relationship between normally distributed quantitative variables and Spearman's rank correlation coefficient was used for comparing non-normally distributed data. The analysis results were presented as mean ± standard deviation and median (minimum–maximum) for quantitative data and as frequency (percentage) for categorical data. The significance level was set at $p<0.05$.

Results

Demographic Characteristics

Our study included 149 women and 181 men. According to age group, 62.4% were between 18 and 40 years old and 37.6% were over 40 years old. By marital status, 57.3% were married and 42.7% were single. By education level, 4.5% were primary school graduates, 29.7% were high school graduates, 56.7% were university graduates and 9.1% were master's or doctoral degree holders. According to monthly income level, 18.2% earning less than 1000 TL, 14.8% earning between 1000-2500 TL, 36.4% earning between 2500-5000 TL, 27% earning between 5000-10000 TL and 3.6% earning over 10000 TL (Table 1). Nonetheless between OHIP-14 scale and Demographic Characteristics there was no statistically significant correlation found. But a statistically significant negative correlation was found between smoking and OHIP-14 (Table 2).

According to the Periodontal Awareness Questionnaire results 92,4% of our population correctly identified that bleeding gums during brushing is a sign of gum disease. 71,2% of the population misidentified or did not know the cause periodontal disease and only 27% correctly identify 'dental plaque' (Table 3). According to Oral behaviors 70% of our population visit the dentist only when in pain but a week correlation was found between the visits and OHIP-14 (Table 4) (P=0,08).

Demographic Characteristics	Frequency (n)	Percent (%)
Age		
18-40	206	62,4%
40-65	124	37,6%
Gender		
Woman	149	45,2%
Man	181	54,8%
Marital status		
Married	189	57,3%
Single	141	42,7%
Educational Level		
Primary school	15	4,5%
High school	98	29,7%
University	187	56,7%
Higher education (master's/doctorate)	30	9,1%
monthly income		
≤1000 TL	60	18,2%
1001-2500 TL	49	14,8%
2501-5000 TL	120	36,4%
5001-10000 TL	89	27,0%
≥10001TL	12	3,6%

Table 1: Demographic data of the individuals participating in our study.

	Mean ± SD	Average (min. - max.)	Test statistic	P-value
Age				
18-40	12,8 ± 8,6	11,0 (0,0 - 43,0)		
≥41	12,0 ± 8,1	10,0 (0,0 - 41,0)	t=0,798	0,425
Gender				

Woman	13,2 ± 8,3	12,0 (0,0 - 43,0)		
Man	11,9 ± 8,4	10,0 (0,0 - 41,0)	t=1,466	0,144
Marital status				
Married	12,2 ± 8,6	10,0 (0,0 - 41,0)		
Single	12,8 ± 8,1	12,0 (0,0 - 43,0)	t=-0,621	0,535
Educational Level				
Primary school	10,5 ± 8,2	9,0 (0,0 - 27,0)		
High school	13,0 ± 9,3	11,0 (0,0 - 43,0)		
University	12,6 ± 8,2	11,0 (0,0 - 40,0)		
Higher education (master's/doctorate)	11,3 ± 5,8	11,0 (0,0 - 21,0)	F=0,603	0,613
monthly income				
≤1000 TL	14,2 ± 10,1	12,0 (0,0 - 43,0)		
1001-2500 TL	10,9 ± 6,8	11,0 (0,0 - 27,0)		
2501-5000 TL	11,5 ± 7,9	10,0 (0,0 - 39,0)		
5001-10000 TL	13,9 ± 8,5	13,0 (0,0 - 41,0)		
≥10001TL	10,1 ± 6,0	8,0 (0,0 - 19,0)	F=2,425	0,050
Smoking Habit				
Yes	14,0 ± 9,2	12,5 (0,0 - 41,0)		
No	11,8 ± 7,9	11,0 (0,0 - 43,0)	t=-2,283	0,023

Table 2: Shows the relationship between demographic data and OHIP-14. No statistically significant relationship was observed except for smoking habits.

	Frequency (n)	**Percent (%)**
What do you think dental plaque is?		
Correct response	221	67
Incorrect response	109	33
What do you think dental plaque causes?		
Correct response	112	33,9
Incorrect response	218	66,1
What do you think tooth decay is?		
Correct response	30	9,1
Incorrect response	300	90,9
What do you think Calculus is?		
Correct response	66	20
Incorrect response	264	80
What does it mean when your gums bleed while you're brushing your teeth?		
Correct response	25	7,6
Incorrect response	305	92,4
What causes tooth and gum problems?		
Correct response	241	73
Incorrect response	89	27
How can we prevent tooth and gum disease!		
Correct response	23	7
Incorrect response	307	93

Table 3: Distribution of correct answers to periodontal awareness questions.

	Mean ± SD	Average (min. - max.)	Test Statistic	P-value
How often do you brush your teeth daily?				
irregular	13,2 ± 9,1	12,0 (0,0 - 40,0)		
Once in a day	12,9 ± 8,4	11,0 (0,0 - 43,0)		
Twice or more	11,9 ± 8,0	11,0 (0,0 - 41,0)	F=0,627	0,535
How often do you visit the dentist?				
When I have pain	12,4 ± 8,3	11,0 (0,0 - 41,0)		
Regular	14,6 ± 11,4	11,0 (0,0 - 43,0)		
For time to time	11,8 ± 7,1	11,0 (0,0 - 28,0)	F=0,806	0,451
Do you smoke?				
No	11,8 ± 7,9	11,0 (0,0 - 43,0)		
Yes	14,0 ± 9,2	12,5 (0,0 - 41,0)	t=-2,283	0,023
What do you think dental plaque is?				
Staining on teeth	11,0 ± 9,2	10,5 (0,0 - 36,0)		
Soft deposits on teeth	12,9 ± 8,6	11,0 (0,0 - 39,0)		
Hard deposits on teeth	12,4 ± 7,9	10,5 (0,0 - 41,0)		
I am not sure	12,6 ± 8,7	12,0 (0,0 - 43,0)	F=0,378	0,769
What do you think dental plaque causes?				
It stains teeth	10,9 ± 8,5	9,5 (0,0 - 29,0)		
Causes tooth decay and/or gum disease	12,6 ± 8,3	11,0 (0,0 - 41,0)		
I am not sure	12,8 ± 8,5	12,5 (0,0 - 43,0	F=0,627	0,535
What causes tooth and gum problems?				
Dental Plaque	12,4 ± 9,6	10,0 (0,0 - 41,0)		
Calculus	12,9 ± 7,9	13,0 (0,0 - 37,0)		
I am not sure	12,0 ± 8,1	10,5 (0,0 - 43,0)	F=0,329	0,720

Table 4: The total OHIP score demonstrates a statistically significant variation according to smoking status (p=0.023). The mean score for non-smokers was 11.8, while smokers demonstrated a mean score of 14.0. The total OHIP score demonstrated no variation according to other oral hygiene habits and periodontal awareness questions ($p > 0.05$).

Discussion

The concept of OHRQoL is gaining prominence in the field of dentistry, facilitating the development of customized solutions to address specific needs and enabling the evaluation of clinical assessments and study outcomes [8]. A plethora of written and verbal scales have been developed to assess OHRQoL. The most widely used and universally recognized scaling system with proven reliability is the OHIP-14 [9,10]. The OHIP-14 was selected for the present study due to its capacity to reflect the individual's subjective assessment of their oral health status. In their 2017 study, Ferrarie, et al., advanced the argument that, in studies where a qualiy of life questionnaire is to be applied, the evaluator should not have knowledge of the participants' personal or medical characteristics [11]. The underlying rationale for this approach is to mitigate the potential influence of participant responses on the study's outcomes, thereby ensuring the integrity and validity of the results. In this particular context, the personal and medical information of patients who applied to the Periodontology Department of the Faculty of Dentistry at Bülent Ecevit University has not been included in the study.

In their 2006 study on the association between oral health-related quality of life and periodontal conditions, Ng, et al., underscored the significance of sociodemographic data [1]. And the study highlighted the quality of life experienced by an

individual in relation to their oral health is closely related to their habits concerning oral hygiene, the sociocultural environment in which they live and demographic data that determine the individual's level of well-being. Furthermore, Mason, et al., 2006 study demonstrated that factors such as gender, age, marital status, socioeconomic income level, smoking habits, dental visits and oral hygiene habits significantly influence quality of life [12]. Therefore, this information was incorporated into our study. Microbial dental plaque is a soft deposit on the surfaces of teeth. In literature, the definition of dental plaque has often been evaluated in studies assessing periodontal knowledge and periodontal awareness [13,14]. In their 2002 study, Taani, et al., assessed periodontal awareness and knowledge levels among Jordanian adults, in which they questioned participants on their definition of dental plaque and determined the correct response rate to be 15.6%. The individuals in this study identified dental plaque not as a soft deposit but as a community of bacteria [14].

In our study, participants were asked the question 'What do you think dental plaque is?' and 67% answered incorrectly. We thought that the level of periodontal awareness regarding dental plaque is quite low in population participating in our study. It was found that 43% of participants responded with 'hard deposit' to this question. This result indicates that the majority of the study population does not have information about the structure of dental plaque. The correct response rate to the question 'What is the cause of tooth and gum disease?' was 27%, showing that the majority of participants did not know that the primary cause of periodontal diseases is dental plaque. It was found that participants who answered ‘Calculus’ to this question constituted 33.6% of the population. Dental plaque, defined as a soft deposit, is one of the factors that leads to the formation of calculus over time. Individuals not paying much attention to microbial dental plaque on their teeth while maintaining oral hygiene in daily life causes them to be unaware of plaque formation. Thus, the accumulation of unnoticed dental plaque gradually undergoes calcification, turning into calculus and individuals may have considered calculus, which is more easily visible, as the cause of periodontal disease. Additionally, we believe that the routine periodontal treatment in dentistry being referred to as calculus removal and the term calculus removal being more frequently used between the dentist and the patient, may have contributed to this result.

In a study conducted in Germany in 2009 by Deinzer, et al., the participants knowledge of periodontal disease was evaluated. The study found that 77.8% of the participating population answered the question regarding dental plaque correctly [15]. In a pilot study conducted by Macek, et al., in the USA in 2011, 75% of participants stated that they knew dental plaque was the main cause of gingivitis [16]. In our study, 66.1% of the participants provided the correct response to the question, " What do you think dental plaque causes?" The reason for the high rate of correct answers to this question may be increased awareness of oral health through television, newspapers and the internet. In addition, the participants included in the study consisted of patients who attempt to our periodontology clinic. We also believe that the fact that some of the participants were regularly monitored patients may have contributed to their knowledge about this question.

Bleeding while brushing is the most reliable indicator for periodontal disease, enables individuals to detect periodontal disease [17]. Participants demonstrated a high level of periodontal awareness by correctly answering the question " What does it mean when your gums bleed while you're brushing your teeth?" at a rate of 92.4%. This is because gum bleeding during tooth brushing is frequently depicted visually through mass media and shown to cause periodontal disease. Bleeding gums, which serves as a warning sign for periodontal disease, triggers individuals to visit the dentist. As a result, the likelihood of early diagnosis and treatment increases.

Quality of life is influenced by an individual's internal values and sociodemographic factors [18]. However, our study found no significant relationship between sociodemographic data and OHIP-14 scores. This result requires the examination of many parameters. Quality of life scores have a dynamic structure that can change continuously over time. Individual attitudes and behaviors are constantly changing and human nature has the ability to adapt to ongoing circumstances. In addition, thanks to social health policies in our country, the vast majority of the population may have the opportunity to receive treatment for oral health problems. Furthermore, individuals with low periodontal awareness view tooth loss as a natural consequence of aging. At the same time, the fact that our study was applied in our clinic so a narrow sociocultural group may have also contributed to this result. On the other hand, data obtained from applying the study to a wider audience will allow this relationship to be presented more objectively.

Regular dental visits play an important role in terms of knowledge and implementation of professional oral care treatments and oral hygiene habits applied by dentists [19]. In our study, the frequency of visits to the dentist was examined and it was found that 70% of participants visited the dentist when they had pain. A study conducted by Çağlayan, et al., in 2009, which evaluated the relationship between oral health-related quality of life and oral disorders in the Turkish population, included 1090 participants and reported that 50.1% of participants visited the dentist with complaints of toothache [20]. Ömürlü, et al., concluded in a study conducted in Turkey in 2011 that 77.5% of participants visited the dentist when their teeth hurt [21]. These results indicate that the level of oral health awareness in Turkey is not sufficient.

Numerous studies have demonstrated a positive correlation between oral health and cigarette smoking [20,22]. In our study, the OHIP-14 total score was evaluated according to cigarette smoking status and a statistically significant difference was found. (p =0,023). The mean score for non-smokers was 11.8, while the mean score for smokers was 14.0. A study conducted by Çağlayan, et al., in 2009 on the Turkish population concluded that smoking has a negative effect on oral health-related quality of life [20]. A cohort study conducted by Yiengprugsawan, et al., among Thai adults reported that participants who smoked had higher OHRQoL scores [22]. In our study results, individuals who smoke also have higher OHIP-14 scores. We believe that the results of our study are consistent with the literature.

Conclusion

Our study found no significant difference between demographic data and OHIP-14 scores. However, it was concluded that smoking reduces oral health-related quality of life. Although no relationship was found between periodontal awareness questions and OHIP-14, 73% of the population we examined did not know what causes dental and gum diseases. In light of our findings, we believe that individuals with low periodontal disease awareness may be at greater risk of developing the disease and that awareness should be increased in these individuals through written, visual and auditory methods.

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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None

Data Availability Statement

Not applicable.

Ethical Statement

The project did not meet the definition of human subject research under the purview of the IRB according to federal regulations and therefore, was exempt.

Informed Consent Statement

Informed consent was taken for this study.

Authors' Contributions

All authors contributed equally to this paper.

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