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Assessment of Oral Health-Related Quality of Life Using the Oral Impacts on Daily Performance (OIDP) Index in Patients Visiting a Dental Clinic in Mashhad, Iran

Sara Esfandi[1], Mohammad Harati[1,] *

1. Department of Dentistry, Razavi Hospital, Imam Reza International University, Mashhad, Iran

***** ***Corresponding author:*** Mohammad Harati. Department of Dentistry, Razavi Hospital, Mashhad, Iran. Email: harati.1994@gmail.com

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Abstract

Background: The Oral Impact on Daily Performance (OIDP) index is a key indicator that evaluates how individuals' oral health conditions affect their ability to perform daily activities.

Objectives: This study aimed to evaluate oral health-related quality of life (OHRQoL) via the OIDP index among patients visiting the dental clinic at Razavi Hospital.

Methods: This cross-sectional study was conducted on 100 systemically healthy adults attending the dental clinic at Razavi Hospital. Demographic data, oral hygiene behaviors, and dental visit history were collected through a questionnaire. OHRQoL was assessed using the validated Persian version of the OIDP index. Clinical oral health status was evaluated by measuring the decayed, missing, and filled teeth (DMFT) index and Bleeding on Probing (BOP). Data were analyzed using Fisher's Exact Test, Pearson correlation, and independent t-test. P-values lower than 0.05 were considered statistically significant.

Results: Of the 100 participants (68% female, mean age 52.25 ± 15.00 years), 75% reported at least one daily activity affected by oral health in the past six months. Eating food (51%), smiling (17%), and social interaction (16%) were the activities most impacted. Toothache (59%) was the leading cause of functional limitations. The mean OIDP score was 6.52 ± 6.10. OIDP scores were significantly correlated with age ($r = 0.243$, $P = 0.015$) and DMFT ($r = 0.421$, $P < 0.001$), but not with brushing frequency or dental visit frequency. No significant difference in OIDP scores was found between individuals with BOP-positive and BOP-negative results.

Conclusion: The impact of oral and dental health on patients' quality of life was considerable, with dental pain being the most common contributing factor. Higher impact levels were significantly associated with increasing age and higher DMFT scores.

Keywords: Dental caries, Oral health-related quality of life, Oral diseases, Toothache.

1. Background

The World Health Organization (WHO) defines health as follows: Health is not merely the absence of disease or physical defects, but also the absence of any psychological, social, economic, and physical health issues for every individual in society. Harm to any of these dimensions disrupts an individual's balance and leads to a decline in overall health. Based on this definition, society's attention to the concept of quality of life has increased (1). Clinical dental examinations alone are insufficient to determine the needs patients perceive regarding their oral health. To better understand patients' perceived needs in the field of oral health, indicators assessing oral health-related quality of life are used. The

concept of Oral Health-Related Quality of Life (OHRQoL) refers to the extent to which an individual is satisfied with their oral condition and how much their daily functioning is affected or disrupted by it (2). Currently, non-clinical indicators related to oral health are widely used to supplement the information obtained from clinical indices, in order to examine the limitations caused by the functional, psychological, and social impacts of oral diseases in different communities (3).

The Oral Impact on Daily Performance (OIDP) index is one of the key OHRQoL indicators that evaluates how individuals' oral health conditions affect their ability to perform daily activities. This instrument is developed based on the conceptual framework of the International Classification of Impairments, Disabilities, and Handicaps of the WHO (4). This index comprises 11 items to measure the oral impacts on physical, psychological, and social aspects of everyday life, focusing on the feeling-state dimensions (5). OIDP is particularly significant for use in developing countries (4). It examines the impact of oral conditions on eating, speaking, cleaning teeth or dentures, performing physical activities such as housework, smiling and showing teeth without discomfort or embarrassment, sleeping and resting, enjoying social interactions, carrying out work-related tasks, and emotional states, including becoming upset more easily than usual. The OIDP index has been validated and used in countries such as Iran (3, 6, 7), South Korea (8), India (9, 10), and several European countries (1, 11-13). It has also been used in assessing the impact of dental treatments, such as placing dental implants, orthodontic treatment, or treating oral lesions like oral lichen planus, on OHRQoL (7, 14). Identifying the influence and impact on daily activity performance is crucial for planning, organizing, implementing, and assessing oral health services and programs, as the evaluation encompasses not only biological and measurable factors but also individuals' self-perception. Despite its importance, there is a lack of information regarding patients in Mashhad, Iran's second-largest city. Razavi Hospital's dental clinic is recognized as a premier dental care center. Therefore, the aim of this study was to evaluate the OIDP index among patients visiting the dental clinic at Razavi Hospital and to examine its relationship with demographic characteristics and objective oral health indicators.

2. Objective

This study aimed to evaluate oral health-related quality of life (OHRQoL) via the OIDP index among patients visiting the dental clinic at Razavi Hospital.

3. Methods

Participants

The present analytical cross-sectional study was conducted on systemically healthy patients aged 18 years or older who visited the dental clinic of Razavi Hospital. The sample size was calculated using Kish-Leslie's formula for cross-sectional studies, based on the findings of a previous study (15), a 10% allowable error, and a 95% confidence level. The minimum required sample size was 91 patients, which was increased to 100 to enhance the study's precision.

After explaining the study objectives and procedures and obtaining written informed consent, a separate form was used to collect patients' demographic data, including age and gender. Oral hygiene behaviors, such as frequency of oral cleaning (irregular, once per day, and twice or more per day) and dental visits over the past year (never, once, or twice or more), were recorded at the beginning of the questionnaire.

Assessing oral health-related quality of life

In this study, the Persian version of the OIDP questionnaire was used as the data collection tool (Table 1). This questionnaire

was reviewed and validated for the Iranian population by Dorri et al. (6), and its validity and reliability have been confirmed. The index includes a list of 11 problems that can be affected by a person's oral health condition, including eating, speaking, cleaning teeth, resting and sleeping, smiling, laughing, and showing teeth without embarrassment, reading, the ability to express emotions, and social interactions

Table 1. Variables examined in the questionnaire related to the OIDP index

Question	Options
In the past six months, have you experienced any problems (behavioral/activity-related*) due to issues with your mouth, teeth, or dentures?	Yes • No •
Did you experience this (behavioral/activity) problem consistently throughout the six months, or only during part of it?	Regularly during the past 6 months • Only during part of the past 6 months •
During the past six months, how often did you experience this (behavioral/activity) problem?	Almost every day • About 3–4 times a week • About 1–2 times a week • About 1–2 times a month • Less than once a month • I don't know •
Over the past six months, how long did you experience this (behavioral/activity) problem?	More than 3 months • 2–3 months • 1–2 months • 6 days to 1 month • 5 days or less • I don't know •
How much did this (behavioral/activity) problem affect your daily life?	Very little • Relatively little • Moderate • Relatively severe • Very severe • I don't know •
Which of the following oral conditions caused the above (behavioral/activity) problem for you?	Tooth sensitivity • Gum bleeding • Tooth decay or cavities • Broken tooth • Gum swelling or abscess • Tooth loss or extraction • Gum recession • Dental tartar • Mouth sores • Loose teeth • Bad breath • Tooth discoloration or staining • Tooth position issues, misalignment, gaps, or protruding teeth • Oral or facial deformity, such as cleft lip or palate • Tooth shape or size issues • Clicking sound in jaw joints • Unsatisfactory dental restorations or crowns, such as broken or discolored ones • Orthodontic appliances • Tooth wear • Toothache • I do not know • Other problems: ------
*Behaviors and activities include: Eating food/ speaking/ cleaning teeth or dentures/ sleeping/ going out / doing light physical activities such as housework/ relaxing/ smiling, laughing, showing teeth without discomfort or embarrassment / emotional state such as becoming easily upset/ enjoying the social contact with others such as friends, relatives, and neighbors/ carrying out main role or work.	

If a participant reported experiencing an oral impact on any daily activity within the past six months, they were further asked whether the impact was regular or occasional during that period. The frequency (Questions 3 or 4 in Table 1) and severity (Question 5 in Table 1) of each impact were then assessed using a separate 5-point Likert scale. The lowest frequency or severity was given a score of 1, and higher levels of frequency and severity were assigned scores of 2, 3, 4, and 5, respectively. The score for each item was calculated by multiplying the frequency and severity scores.

Evaluating participants' oral health status

An oral examination was performed using a dental mirror and probe under proper lighting conditions, and the DMFT index was recorded according to the WHO criteria. Additionally, the Bleeding on Probing (BOP) index was evaluated. For BOP assessment, gentle probing was performed on four sites (mesial, buccal, distal, and lingual) of each tooth, and after 30–60 seconds, the presence or absence of bleeding was recorded. The percentage BOP index was calculated and divided into levels below or above 20% (16). BOP is one of the earliest signs of gingival inflammation that precedes established gingivitis, and its absence is an excellent negative predictor of future attachment loss (17).

Statistical analysis

Data were analyzed using SPSS 27.0 software. To compare the frequency of each OIDP index occurrence between genders, Fisher's Exact Test was used. The correlation between the OIDP score and age, DMFT,

frequency of brushing, and dental visits was measured using Pearson correlation. To assess the effect of BOP, an independent samples t-test was used. P values lower than 0.05 were considered statistically significant.

4.Results

In the present study, a total of 100 patients who had visited the dental clinic at Razavi Hospital participated. Among them, 68 were women, and the mean age of participants was 52.25 ± 15.00 years (range: 19 to 68 years). Most individuals (46%) brushed their teeth irregularly, while 33% brushed them once a day. Half of the participants (50%) reported not visiting a dentist during the past year, and 28% had visited once. Gum bleeding was observed in 67% of the participants. The mean DMFT index was 7.06 ± 4.18.

Regarding OIDP findings, 75% of individuals reported experiencing at least one functional limitation affecting their daily activities in the past six months. As shown in Table 2, eating food (51%), smiling (17%), and social interaction (16%) were the functions most affected. According to Fisher's Exact Test, the frequency of these limitations did not differ significantly between men and women.

Table 2. Prevalence of affected daily performances and comparison between female and male participants

Function	Women	Men	Total	P value
Eating food	37 (54.4%)	14 (43.8%)	51%	0.393
Speaking	4 (5.9%)	2 (6.3%)	6%	0.628
Cleaning teeth or dentures	5 (7.4%)	3 (9.4%)	8%	0.708
Doing light physical activities	2 (2.9%)	1 (3.1%)	3%	0.690
Going out	0 (0.0%)	0 (0.0%)	0%	-
Sleeping	8 (11.8%)	2 (6.3%)	10%	0.495
Relaxing	7 (10.3%)	3 (9.4%)	10%	0.597
Smiling, laughing without embarrassment	11 (16.2)	6 (18.8%)	17%	0.779
Emotional state; becoming easily upset	9 (13.2%)	2 (6.3%)	11%	0.495
Enjoying the contact with other people	11 (16.2%)	5 (15.6%)	16%	0.597
Carrying out the main role or work	10 (14.7%)	2 (6.3%)	12%	0.328

Regarding the causes of these limitations, many patients cited multiple reasons for their difficulties with chewing. As shown in Table 3, the most common reasons for functional limitations were toothache (59%), dental caries (18%), tooth fracture (17%), and tooth loss (12%).

The mean OIDP score was 6.52 ± 6.10. The relationship between OIDP scores and DMFT, BOP (bleeding on probing), and age was examined. Independent samples t-test showed no significant difference in OIDP scores between individuals with positive or negative BOP (P = 0.353).

As indicated in Table 4, the Pearson correlation test showed a significant positive correlation between the OIDP score and age (r = 0.243, P = 0.015) and between OIDP and DMFT (r = 0.421, P < 0.001), meaning that with increasing age and DMFT, the negative impact of oral conditions on patients' functionality significantly increased. However, the frequency of brushing and dental visits during the past year was not

associated with OIDP scores.

Table 3. Frequency of oral conditions self-reported by patients as causes of functional impairments

Function	Tooth sensitivity	Dental caries	Gingival bleeding	Fractures	Abscess	Gingival recession	Gingival ulcer	Tooth loss	TMJ clicking	Broken/discolored restoration	Toothache	Tooth discoloration	Teeth alignment	Halitosis
	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Eating food	2	12		12	4			4	1	2	31			
Speaking				1				1				2	1	
Cleaning teeth or dentures	3	1	2	1		1								
Doing light physical activities											3			
Sleeping				2	1		1				6			
Relaxing				1							7			
Smiling,laughing without embarrassment		3		4				2				4	4	
Emotional state; becoming easily upset				4	1			2			3			
Enjoying the contact of other people		1		2				2		1	2	1	2	1
Carrying out the main role or work		1			1			1			7		1	
Total	5	18	2	17	7	1	1	12	1	3	59	7	8	1

Table 4. Correlation between age, DMFT, brushing frequency, and dental visits with OIDP scores

Variable	Correlation coefficient	P value
Age	0.243	0.015
DMFT	0.421	<0.001
Brushing frequency	0.146	0.147
Dental visit frequency	0.148	0.141

5. Discussion

In this study, the OIDP index was measured among visitors to the dental clinic of Razavi Hospital. Examining the relationship of this index with objective oral health indicators, oral hygiene behavior, and demographic variables showed that increased age and DMFT were significantly associated with a greater impact of oral health status on daily activities. In contrast, brushing frequency, dental visits, and gender were not found to be significantly related to OIDP scores.

Using clinical indices alone to determine oral health status and treatment needs is not sufficient, as these evaluations are often based on expert opinion (7, 18). OIDP is one of the key indicators of oral health-related quality of life, assessing the impact of oral conditions on individuals' ability to perform daily activities. It includes 11 items that cover the psychological, physical, and social aspects of life.

In this study, 75% of participants reported at least one limitation due to oral diseases. Similarly, in Mohebbi et al.'s study, 85.6% of patients at Tehran Dental

School reported at least one oral health-related limitation. The current study's findings are comparable to prevalence rates reported in an elderly Korean population (68%) (8). Despite focusing on dental clinic attendees, the prevalence was only slightly higher than that reported by Dorri et al. (6) in Mashhad (64.9%). This suggests a high prevalence of untreated oral disease in this city. The prevalence observed in the current study and Dorri's is significantly higher than that reported in some high-income and upper-middle-income countries. For example, the first major national survey covering a wide age range of adults in Norway reported an impact of 19.0% on individuals aged 25–44 years and 17.9% in the 45–66 years age group (11). In a population-based study of adults aged 21 years and older conducted in England, Wales, and Northern Ireland, only 16.0% reported oral impacts on daily performance (19). Moreover, only 8.85% of adults in Cape Town, South Africa, experienced one or more of the OIDP domains (20), who generally enjoy better oral health. On the other hand, the prevalence is lower than that reported in Priya's study (10) in India, where all 216 dental clinic patients reported at least one functional limitation. It is demonstrated that a country's economic situation has a significant impact on the degree and severity of oral health-related quality of life issues.

Consistent with many other studies (7, 10, 16, 20), eating difficulties were the most commonly reported issue in this study. In Nigerian adults, eating/enjoying food was also the dominant impact (31.8%) (21). In Sri Lankan adolescents (15–19 years), the most significant impact was the enjoyment of food; 36.8% of respondents reported this impact (5). However, based on the population, the reported issue may differ. In a study by Quadri et al. (22) that was performed in Saudi Arabia and the children (12–14 years) group, studying (school performance) was the most frequently impacted function (38.0%).

The most common reason reported for eating problems was toothache, aligning with findings from Kida et al. (23) in a Thai population. Dental pain was the most frequently noted factor associated with higher OIDP scores. Pain is a multidimensional phenomenon that can be influenced by various factors and has a significant, detrimental impact on daily performance. In adults, pain is a significant factor leading to work absenteeism, potentially affecting their daily routines, productivity, and employment (24). A study carried out in the United Kingdom found that 37.0% of working individuals who sought oral health services did so due to tooth pain, with 20.0% of them needing to leave their jobs to receive dental treatment (25). Therefore, prioritizing oral health care for adults is essential to ensure tooth preservation in this demographic, especially given the rise in life expectancy and the long-term implications of oral health on overall well-being.

A significant relationship was observed between the OIDP index and age, indicating that oral health impacts increased with age. Older individuals often experience a range of dental issues, including periodontal disease, tooth decay (also known as caries), tooth loss, oral mucosal lesions, oral infections, and temporomandibular joint disorders. Older patients tend to have fewer functional teeth, so problems with the remaining teeth have a more significant impact on their daily lives. These issues may reduce the intake of healthy foods, such as fruits and vegetables, while increasing the consumption of soft foods high in saturated fats and cholesterol. John et al. (26) similarly found that OHRQoL decreased with age using the OHIP index. Notably, Astrom et al.'s study (11) on elderly individuals found an inverse relationship between age and OIDP score, possibly due to better oral

health care in developed countries. A study in Brazil on individuals aged 65 and above found that only 34.6% reported limitations in one or more OIDP domains (27). This finding may be associated with household income, self-perceived need for dental treatment, dental pain, dissatisfaction with oral health, and use of mandibular partial dentures. A 15-year cohort study also demonstrated that the impact of oral conditions on the OIDP index increased significantly over time (28), underscoring the importance of prioritizing the oral health of this vulnerable group to maintain their quality of life.

In contrast, studies conducted in Sweden, Malaysia, and Germany found no association between OIDP scores and gender or age (1, 13, 29). Furthermore, in Nigeria, the OIDP score was not influenced by age, gender, residence, education level, or diagnosed dental condition (21). These discrepancies may stem from differences in population demographics, socioeconomic conditions, and objective oral health status.

In the present study, the DMFT index had a significant direct correlation with OIDP scores, while no association was found with BOP. Similarly, Andersson et al. (16), studying patients at a dental clinic in Zambia, found that 61.5% of the patients had functional limitations due to oral diseases, which were significantly associated with having two or more decayed teeth. However, they found no relationship between BOP and OIDP in 20% of cases. Another study on adolescents aged 12–14 also showed that the number of decayed teeth and DMFT could predict OIDP scores (22). Lim et al. (30) reported that more decayed teeth (DMFT index) were significantly associated with poorer OHRQoL (OIDP-based). In Simangwa et al.'s study (31), a DMFT score above zero was significantly linked to OIDP-related functional limitations in adolescents.

This study revealed that oral conditions significantly affect individuals' quality of life. Since dentists often do not consider self-reported problems or psychosocial aspects during treatment, it is recommended that more attention be paid to these factors during clinical visits to improve patients' quality of life.

Caution should be exercised when generalizing these results, as participants were selected from a single dental clinic in a single city. Cultural and socioeconomic factors may have influenced the findings. Future studies should include populations from other settings, such as private offices and public clinics.

6. Conclusion

The impact of oral and dental health on patients' quality of life was considerable, with dental pain being the most common contributing factor. Higher impact levels were significantly associated with increasing age and higher DMFT scores.

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