

Oral impact on daily performance in Iranian adults

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Original Article

Abstract

BACKGROUND AND AIM: The aim of this study was to evaluate the prevalence and severity of oral impact on daily performance (OIDP) in adults attending dental clinics in the city of Kerman, Iran.

METHODS: In 2010, a cross-sectional survey was conducted on a sample of 400 patients (age 20-50 years) referring to dental centers in Kerman. Validated OIDP inventory was used to collect data. Clinical examination was also carried out by a trained interviewer. Analysis of variance (ANOVA) and Student's t-test were used for statistical analysis.

RESULTS: Oral and dental diseases affected at least one daily activity of all participants (100%) during the six months prior to the study. The mean OIDP score of the subjects was $19\% \pm 12\%$. The most common affected activity was eating (92.6%). The most prevalently reported oral problem was dental caries (65.3%). Subjects who had better dental hygiene (tooth brushing and flossing habits) were more likely to have lower OIDP score ($P = 0.001$ for brushing; $P = 0.002$ for flossing).

CONCLUSIONS: The results of the study showed that people who attended dental clinics had at least one oral/dental problem that affected their daily performance. Since the prevalence of OIDP was very high, providing more dental care and services is required.

KEYWORDS: Oral Impact on Daily Performance, Oral Health-Related Quality of Life, Oral Health, Adult, Cross-Sectional Studies

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Oral diseases such as dental caries, periodontal disease, chronic oral and facial pain, mouth and pharynx cancers, and soft tissue lesions are highly prevalent all around the world. These complications affect not only the patients' physical conditions but also their economic, social, emotional, and psychological dimensions of health. Such diseases may hence disturb the patients' quality of life (QoL), oral function, and appearance.¹ Although common clinical indicators including decay, missed, and filled teeth (DMFT) and community periodontal index for treatment needs (CPITN) determine the quantity of oral diseases, they fail to evaluate

the impact of diseases on life performance and mental health of patients. Therefore, researchers started developing tools to assess oral health-related quality of life (OHRQoL) of patients in the early 1990s.² Oral impact on daily performance (OIDP) is a popular index of OHRQoL³⁻⁵ which assesses the impacts of oral conditions on a person's abilities to perform daily life activities and behaviors.⁶ Several studies have evaluated OIDP among adults in the United Kingdom,⁷ Greece,^{8,9} Thailand,¹⁰ Tanzania,¹¹ Uganda¹², and Norway.¹³ However, only two Iranian studies about OIDP have been published. In 2007, Dorri et al. validated the Persian version of the OIDP inventory (Cronbach's alpha = 0.79)

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and found oral diseases to have the greatest impact on eating.⁶ In another study, Khoshnevisan et al. investigated the validity and reliability of child-OIDP inventory and measured the frequency and severity of the problems among children.¹⁴ This study tried to evaluate the OIDP in the biggest province of Iran (Kerman).

Methods

This cross-sectional study was conducted on a sample population from Kerman (Iran) in 2010. Kerman, the largest province in Iran, is located in the southeastern part of the country and has a population of about 750,000 residents. Four hundred individuals referring to private and governmental dental clinics were selected by simple convenience sampling after oral consent and awareness about the importance and objectives of the study. All participants were then asked by a trained interviewer. We used a two-section questionnaire containing demographic information such as gender, occupation, income level, age, education level, and personal habits (smoking, frequency of brushing and flossing, addiction, and drinking alcohol) in the first part and oral and dental problems in the second. The participants were also asked if they had experienced any of the 26 oral and dental problems in the OIDP inventory during the last six months. At first, clinical examination of caries and tooth mobility (pathologic tooth mobility more than 1 mm) was performed using a light source (flashlight) and a tongue blade.

In the next stage, the participants were asked about the effects of each dental problem (11 out of 26 items) on their daily activities. Using a Likert scale, the frequency of each activity was scored as one-four or nine (less than once month, almost once or twice a week, almost three-four times a week, almost every day, and no idea, respectively). The frequency of irregular activities during the past six months was scored as one-five or nine (for five days or less, for six days to one month, for one-two months, for two-three

months, for more than six months, and no idea, respectively). The severity of the effects of oral problems on daily activities was also scored as zero to five or nine (no effect, very little effect, relatively little effect, moderate effect, relatively severe effect, very severe effect, and no idea, respectively).

To determine the effects of oral problems on daily activities, OIDP score was calculated for each activity, i.e. the performance score (severity score \times frequency) was divided by 220 [11 (number of activities) \times 20 (maximum activity score)] as the maximum possible performance score for regular cases or by 275 (11 \times 25) as the maximum possible performance score for irregular cases. The total OIDP score was expressed as the sum of different performance scores (26 items) multiplied by 100 to provide a percentage score.^{6,14}

Continuous and categorical variables were expressed as mean \pm standard deviation (SD) and absolute and relative frequencies, respectively. Comparisons between two groups were made with Student's t-test. Three groups or more were compared using analysis of variance (ANOVA). All analyses were performed in SPSS for Windows 16.0 (SPSS Inc., Chicago, IL, USA). P values less than 0.05 were considered significant.

Results

The study population included 400 female and male employees who referred to dental clinics in Kerman, Iran. The response rate was 100%. The mean age of the participants was 34.00 \pm 8.04 years (range: 20-50 years). Table 1 summarizes the demographic characteristics of the study population. OIDP scores were not significantly associated with occupation (P = 0.610), smoking (P = 0.170), addiction (P = 0.880), level of education (P = 0.210), income (P = 0.097), age (P = 0.330), and sex (P = 0.410). In contrast, the frequency of tooth brushing had a significant relation with OIDP score (P = 0.001), i.e. individuals that brushed their teeth more than twice a day had lower OIDP score. Similarly, subjects who regularly

used dental floss had significantly lower OIDP scores ($P = 0.002$). Moreover, people referring to governmental clinics had higher OIDP scores ($P < 0.001$) (Table 1).

In all participants (100%), oral and dental problems had affected at least one of their daily activities during the past six months. The greatest effects were on eating (92.6%),

tooth brushing (73.4%), and smiling (62.2%). Irritability (as an emotional activity) (2.0%), working at home (as a physical activity) (3.3%), going out for shopping or visiting others (11.9%) were the least common affected activities (Table 2). The most common oral problems in this study were dental caries (65.3%), tooth sensitivity

Table 1. Relative and absolute frequency of demographic variables and oral impact on daily performance (OIDP) scores among the study population (n = 400)

Variable	n (%)	OIDP score	P
Gender			
Male	206 (51.5)	0.18 ± 0.12	0.410
Female	194 (48.5)	0.19 ± 0.12	
Age (years)			
20-30	144 (36.0)	0.18 ± 0.11	0.330
30-40	155 (38.8)	0.18 ± 0.11	
40-50	101 (25.3)	0.20 ± 0.14	
Clinic			
Governmental 1	100 (25.0)	0.18 ± 0.11	< 0.001
Private 1	100 (25.0)	0.17 ± 0.09	
Governmental 2	60 (15.0)	0.26 ± 0.16	
Private 2	60 (15.0)	0.12 ± 0.09	
Governmental 3	80 (20.0)	0.20 ± 0.09	
Job			
Unemployed	152 (38.0)	0.19 ± 0.12	0.610
Employed	248 (62.0)	0.19 ± 0.12	
Income (Rials)			
< 2,000,000	53 (13.3)	0.17 ± 0.10	0.097
2,000,000-5,000,000	278 (69.5)	0.20 ± 0.12	
> 5,000,000	69 (17.3)	0.20 ± 0.12	
Smoking			
Yes	33 (8.3)	0.22 ± 0.11	0.170
No	367 (91.8)	0.19 ± 0.12	
Addiction			
Yes	10 (2.5)	0.19 ± 0.08	0.880
No	390 (97.5)	0.19 ± 0.12	
Alcohol			
Yes	3 (0.7)	0.19 ± 0.12	0.160
No	397 (99.3)	0.19 ± 0.12	
Tooth brushing per day			
No or sometimes	89 (22.3)	0.23 ± 0.12	0.001
Once a day	156 (39.0)	0.18 ± 0.11	
Twice or more a day	155 (38.8)	0.17 ± 0.13	
Flossing per day			
No	198 (49.5)	0.21 ± 0.12	0.002
Regularly	47 (11.8)	0.16 ± 0.14	
Occasionally	155 (38.8)	0.17 ± 0.11	
Level of education			
Illiterate and school education	85 (21.3)	0.20 ± 0.10	0.218
High school diploma	154 (38.5)	0.20 ± 0.12	
Associate degree	83 (20.8)	0.17 ± 0.12	
University degree	78 (19.5)	0.17 ± 0.14	

OIDP: Oral impact on daily performance

Table 2. The prevalence of each activity in the studied subjects (n =400)

Code	Activity	n (%)
1	Eating	365 (92.6)
2	Clearly speaking	108 (27.4)
3	Cleaning the teeth or denture	289 (73.4)
4	Light physical activity like working at home	13 (3.3)
5	Going out for example for shopping or visiting others	47 (11.9)
6	Sleeping	105 (26.7)
7	Resting	57 (14.5)
8	Smiling, laughing, and showing teeth without discomfort and embarrassment	245 (62.2)
9	Emotional conditions (e.g. irritability)	8 (2.0)
10	Spending time with others	121 (30.7)
11	Jobs and work-related activities	59 (14.7)

(60.5%), retention of food (40.0%), and calculus (39.3%). Problems such as inappropriate or ill fit denture (0.3%), removable appliance (1.3%), burning mouth (2.0%), deformities of the mouth and face (cleft lip and palate) (2.3%) had low frequencies. Analysis of 26 cases of oral and dental problems is shown in table 3. The mean OIDP score in this study was $19\% \pm 12\%$ (range: 10%-64%).

Discussion

This study aimed to investigate the prevalence and severity of OIDP among 20-50-year-old adults referring to dental clinics in the city of Kerman. The mean OIDP score was $19\% \pm 12\%$. Dorri et al. reported the mean OIDP score as 4.15 ± 5.94 .⁶ In the study of Srisilapanan and Sheiham found older people to have lower OIDP scores (below 8%).¹⁰ These differences are justifiable since our participants were selected from people referring to dental clinics, i.e. people who definitely had oral or dental problems. Other studies, however, selected subjects from different population.^{4,6,15}

In the present study, all participants explained that oral and dental problems had affected at least one of their daily activities. In other words, the prevalence of OIDP was very high. Different values have been reported for the prevalence of OIDP by Kida et al. (51.2% in urban and 61.2% in rural areas),⁴ Dorri et al. (64.9%),⁶ Srisilapanan and Sheiham (52.8%),¹⁰ Jung et al. (62.9%),¹⁶

Mbawalla et al. (48.2% in the main group and 50.7% in a pilot study),¹⁷ and Wandera (25.5% in urban and 30.6% in rural areas).¹⁸ Cultural differences between the study populations and higher number of assessed problems in our study could have been responsible for such differences.

Dorri et al. examined the validity and reliability of the OIDP inventory among Iranian 20-50- year-old employees in Mashhad.⁶ However, most studies in different countries have evaluated the OIDP inventory between children and elderly.^{4,6-9,14,15,19} As we recruited 400 individuals with the mean age of 34.00 ± 8.04 years, our participants were similar to those in the study of Dorri et al.⁶ in terms of age. The two populations were also similar in sex distribution. In contrast to a number of studies, we did not find a significant relationship between OIDP score and income level. Srisilapanan et al. found people with higher income to have lower OIDP scores.¹⁰ Likewise, Nurelhuda et al.,¹⁵ Mbawalla et al.,¹⁷ and Montero et al.²⁰ indicated higher prevalence of OIDP among individuals with lower socioeconomic status. On the other hand, although we failed to find a significant relationship between OIDP scores and sex and age, Montero et al. suggested oral and dental problems to affect women's daily activities more than men's.²⁰ Moreover, Mbawalla et al. showed that people with greater age had higher OIDP scores.¹⁷

Most subjects in this study had high

Table 3. The prevalence of dental problems and affected daily activities

Dental and oral problems	Yes n (%)	No n (%)	The most common activity n (%)	Regular n (%)	Irregular n (%)
1 Retention of food	160 (40.0)	240 (60.0)	88 (55.0) (3)*	65 (40.6)	95 (59.4)
2 Burning mouth without ulcer	8 (2.0)	392 (98.0)	3 (37.5) (1)	2 (25.0)	6 (75.0)
3 Bad odor of the mouth	120 (30.0)	280 (70.0)	99 (82.0) (10)	47 (39.2)	73 (60.8)
4 Bad taste	77 (19.3)	322 (80.5)	58 (75.3) (1)	29 (37.7)	48 (62.3)
5 Clicking in TMJ	61 (15.3)	339 (84.8)	30 (49.2) (1)	15 (24.6)	45 (73.8)
6 Pain in TMJ	87 (21.8)	313 (78.2)	34 (39.1) (1)	20 (23.0)	67 (77.0)
7 Ill fit or inappropriate denture	1 (0.2)	399 (99.8)	-	-	-
8 Inadequate size and shape of teeth	77 (19.3)	323 (80.8)	67 (87.0) (8)	48 (62.3)	29 (37.7)
9 Removable appliance	5 (1.30)	-	-	-	-
10 Tooth loss (extraction)	119 (29.8)	279 (69.8)	38 (31.9) (1)	67 (56.3)	52 (43.7)
11 Tooth discoloration	66 (16.5)	334 (83.50)	545 (68.2) (8)	36 (54.5)	30 (45.4)
12 Discoloration of the oral mucosa	16 (4.0)	384 (96.0)	15 (93.8) (8)	11 (68.8)	5 (31.3)
13 Oral and facial deformities (cleft lip or palate)	9 (2.3)	391 (97.8)	(10) and (8) 4 (44.4)	6 (66.7)	3 (33.3)
14 Position of teeth(irregular teeth, protruding or spacing)	56 (14.0)	344 (86.0)	39 (69.6) (8)	46 (82.1)	10 (17.9)
15 Ulcer of oral mucosa	22 (5.5)	378 (94.5)	7 (31.8) (1)	4 (18.2)	17 (77.3)
16 Swelling of the gums (gingival abscess)	54 (13.5)	346 (86.5)	33 (61.1) (3)	3 (5.6)	51 (94.4)
17 Poor dental restorations or crowns (e.g., fracture)	32 (8.0)	368 (92.0)	16 (50.0) (1)	10 (31.3)	21 (65.6)
18 Recession of the gum	16 (4.0)	384 (96.0)	5 (31.3) (8)	7 (43.8)	9 (56.3)
19 Calculus	157 (39.3)	243 (60.8)	107 (68.2) (8)	58 (36.9)	99 (63.1)
20 Tooth wear	44 (11.0)	356 (89.0)	37 (84.0) (1)	18 (40.9)	26 (59.1)
21 Dental caries (cavity)	261 (65.3)	138 (34.5)	66 (25.3) (1)	76 (29.1)	183 (70.1)
22 Tooth mobility	60 (15.0)	337 (84.3)	28 (46.7) (1)	8 (13.3)	51 (85.0)
23 Tooth sensitivity	242 (60.5)	158 (39.5)	225 (93.0) (1)	98 (40.5)	144 (59.5)
24 Pain or fatigue of face muscles	138 (34.5)	262 (65.5)	41 (29.7) (6)	25 (18.1)	113 (81.9)
25 Gum bleeding	45 (11.2)	355 (88.8)	35 (77.7) (3)	6 (13.3)	39 (86.6)
26 Tooth fractures	121 (30.2)	279 (69.8)	96 (79.3) (1)	13 (10.7)	108 (89.3)

*Code associated with each activity is listed in table 2

TMJ: Temporo mandibular joint

school diploma and 33 participants were smokers. However, education level and smoking habit were not significantly correlated with OIDP scores. Conversely, Mbawalla et al. explained that children whose parents had higher education levels showed lower OIDP scores and smokers had higher OIDP scores.¹⁷

In the current study, patients who referred to governmental clinics had significantly higher OIDP scores compared to those referring to private clinics. Other studies have also reported a significant correlation between OIDP scores and place of residence (rural and urban areas), i.e. dental problems had more impact on daily life activities of rural residents.^{4,20}

We evaluated oral health behaviors by raising questions about the frequency of tooth brushing and flossing. As we expected, better oral hygiene was associated with significantly lower OIDP scores. According to Nurelhuda et al.¹⁵ and Mbawalla et al.,¹⁷ oral problems had fewer effects on daily activities of people who brush their teeth regularly. However, to the best of our knowledge, no previous studies have assessed the impacts of flossing on OIDP scores.

Similar to previous research,^{4,6,7,10,15-19,21-23} we found eating to be the most commonly affected activity by oral and dental problems. The second most affected activity was cleaning the teeth. Comparable results were reported by other studies.^{4,15,17,18,21}

Although emotional conditions (e.g. irritability) had the least prevalence in our study, Nurelhuda et al.¹⁵ and Mbawalla et al.¹⁷ reported speaking as the least frequently affected activity. Meanwhile, resting, physical activities (such as housework, walking, cleaning teeth), smiling, showing teeth, and working were also suggested as the least troubled activities.^{4,10,15-17} It seems that our participants were less sensitive to their appearance since activities such as smiling and showing teeth were less important to them. They were in fact more concerned about their oral function such as eating and cleaning teeth. Likewise, Wandera et al. reported activities related to appearance to have lower significance compared to activities related to tooth function.¹⁸

In this study, the most common oral problems were dental caries, tooth sensitivity, and retention of food. However, Kida et al.⁴ and Srisilapanan and Sheiham¹⁰ introduced the most common problems as tooth mobility and pain.^{4,10} Since the two studies were performed on the elderly, this finding is justifiable. The most common

factors that affected children's daily activities were reported to be toothache, bleeding gums, and mouth ulcers.^{14,15,19}

Conclusion

OIDP was highly prevalent among our participants and oral problems had a greater impact on their daily activities compared to people in other countries. Therefore, prevention of dental problems in Iran seems vital. In addition, most subjects referred to dental clinics for solving oral problems rather than regular visiting. The authorities are suggested to use the results of this study and similar research and promote prevention in the community. Further research on larger sample size will also be definitely beneficial.

Conflict of Interest

Authors have no conflict of interest.

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