

## Validation of a Persian Version of the Oral Health Impact Profile (OHIP-14)

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### Abstract

**Background:** The oral health-related quality of life indicators are increasingly used to measure the impact of the oral conditions on quality of life. One of the most used indicators is the Oral Health Impact Profile (OHIP-14), but it has never been applied in Iran. The aim of this study was to validate the usage of OHIP-14 among Iranians.

**Methods:** A cross-sectional study was performed in Kerman (Iran). A consecutive sample (n= 400) of the Kerman Dental School Clinics attending patients participated in this study. All participants self-completed the translated OHIP-14. Reliability analyses, validity tests, and responsiveness were carried out to evaluate the psychometric properties of the OHIP-14.

**Results:** The reliability coefficient (Cronbach's alpha) of the OHIP-14 was above the recommended 0.7 threshold and considered excellent (alpha: 0.85). The coefficient of the test-retest reliability measured by ICC was 0.88 (CI 95%: 0.80-0.93). Poorer oral condition was strongly associated with OHIP scores of the patients, supporting construct validity. Moreover, for evaluation of responsiveness, the ES was measured to be 0.43 and the SRM was 0.67.

**Conclusions:** The Persian version of OHIP-14 is a precise, valid and reliable instrument for assessing oral health-related quality of life among Persian population.

**Keywords:** Oral health, Quality of life, Validity, Iran

### Introduction

A patient-based assessment of health status is essential to the measurement of health. Oral diseases are highly common and they do not only have physical but also socioeconomic and psychological consequences on the affected patients. Quality of life is impaired in a large number of these patients and various aspects of their life such as mastication of food and speech can be affected (1). Oral Health-related Quality of Life (OHRQL) is defined as an individual assessment of how the functional, psychological and social factors affect the well-being, discomfort and pain, that the patient experiences in relation to orofacial concerns (1, 2). The need to develop an individual measure when assessing oral health outcomes on an individual level was first suggested by Locker (1988) (2). The most widely used method to assess OHRQL are multiple-item questionnaires (3). Researchers have developed qual-

ity of life instruments specific to oral health to comply with the demand of oral specific measures (4).

The Oral health Impact Profile (OHIP) was developed by Slade and Spencer (1994) and is a technically sophisticated OHRQL instrument that is widely used internationally (4, 5). Original OHIP consists of 49 items. As it is long and time-consuming, Slade (1997) developed a short-form of it with 14 questions; named OHIP-14. OHIP-14 has a good reliability, validity, and precision (6). Fourteen items of OHIP is subdivided into seven domains: functional limitation, physical discomfort, psychological discomfort, physical disability, psychological disability, social disability, and handicap (2, 4, 6).

An example of an OHIP statement is mentioned in one of the questions in this statement (Have you had to interrupt meals because of problems with your teeth, mouth, or dentures?) (4). Patients are

asked how frequently they had experienced each impact in the last month. Responses to the items are recorded in a 5-point Likert scale: 0=never; 1=hardly ever; 2=occasionally; 3=fairly often; 4=very often (7). The OHIP-14 score is calculated by summing the scores of the responses to 14 items and the total OHIP scores ranged from 0 to 56 (5). Total OHIP-14 score represents the overall burden of oral problems. The OHIP-14 was originally developed in English for English-speaking population. Therefore, when used in a non-English-speaking country that is culturally different it should be translated and validated to ensure its proper use (8).

Several language versions of OHIP-14 already exist, for example in German, Swedish, Hebrew, Chinese, and Scottish. The different versions of this scale have shown to be valid and reliable instrument to assess OHRQL in the respective populations (9-13). The OHIP also has been applied on Sinhalese, Japanese and Korean elderly (8, 14,15).

In the World Oral Health Report (2003), WHO listed the impact of oral health on the quality of life as an important element of the Global Oral health Programme. However, the small number of published papers in this field from Middle East countries, including Iran indicates that area of health has not received enough attention in this region (6).

The aim of this study was to develop a Persian version of the Oral health Impact Profile and to assess the new instrument's psychometric properties in Iranian population.

## Materials and Methods

The study was conducted in Kerman, the largest province of Iran that is located 895 kilometers south of the capital. The Ethical Committee of Kerman University of Medical Science approved this study with code number: 620. For convenience, we randomly selected our subjects who were the participants of Kerman Dental School Clinics and an interviewer-administered questionnaire was used to collect the data. Two Iranian dentists, fluent in English performed a forward

translation. The translated text was translated back into English by two English and literature graduates. Thereafter, in one session under the supervision of the Research Center, these four people discussed and approved unanimously that the translation was the same as the original English version.

The reliability was examined by measuring internal consistency reliability and reproducibility.

Internal consistency reliability was assessed by examining internal consistency (Cronbach's alpha) and item-total correlation.

Reproducibility was evaluated by measuring test-retest reliability. Test-retest reliability was calculated using intraclass correlation coefficient (ICC). A sample of 60 respondents was interviewed two weeks after the first interview.

Responsiveness of an instrument is the ability to detect important changes over time. It was evaluated by calculating the effect-size (ES) and Standardized Responses Mean (SRM) by computing pre-intervention and post-intervention mean OHIP scores. They were analyzed in a subgroup of 40 patients treated with dental extraction of one painful tooth that no longer served a purpose. All these treatments were performed by an experienced dentist.

Validity refers to the extent to which the instrument measures what it is supposed to measure. The method of known-group comparison was used to determine the degree to which the OHIP was able to discriminate between mutually exclusive subgroups of subjects. It was expected that subjects with more than 25 teeth that had condition such as better self-rated oral health and less frequently referred to a dentist, and those who perceived that they did not need dental treatment, would show lower OHIP scores than those without these conditions. Construct validity was tested by using Student's *t*-test and correlation coefficient (Pearson).

## Results

All 400 subjects who were invited for the interview, accepted to participate in the study. The mean ( $\pm$ SD) age of subjects was 35.8(12.8).

Two hundred and thirty of the candidates (57.5%) were male. Thirty-four (8.5%) of them were illiterate, 299 individuals (74.7%) had primary or secondary education and the remainder (16.8%) were highly educated. The mean ( $\pm$ SD) OHIP-14 total score was 14.6( $\pm$ 10.1) with a median, min., and max. Of (12, 0, and 49) respectively. The mean ( $\pm$ SD) total number of problems reported was 2.4 ( $\pm$ 2.7), ranging from 0 to 14. Thirty individuals (7.5%) were reported with no problem at all. The internal consistency reliability coefficient (Cronbach's alpha) for the short Persian version of the OHIP form was 0.85 could not be improved if any items were deleted (Table 1). The item-scale correlations of the 14 items (after cor-

rection for overlap) are shown in Table 1, in which none was less than the minimum acceptable level of 0.4. The coefficient of test-retest reliability measured by ICC was 0.88 (CI 95%: 0.80-0.93). A significant mean change (2.4 $\pm$ 3.6) was evident in OHIP scores in regards with surgical tooth extraction intervention. Therefore, the mean ( $\pm$ SD) baseline and post-intervention scores were 27.6 ( $\pm$ 5.6) and 25.2( $\pm$ 7.7), respectively ( $P$ <0.01). The ES was measured to be 0.43 and the SRM to be 0.67. A significant difference was visible when either comparing the mean OHIP scores according to some conditions (Table 2). Those with poorer oral condition, subjectively or objectively, reported higher OHIP scores.

**Table 1:** Corrected item-scale correlations and Cronbach's alpha values if item deleted

Cronbach's alpha if item deleted	Item-scale correlation	Item
0.84	0.46	1.Had trouble pronouncing some words
0.84	0.47	2.Felt sense of taste had worsened
0.84	0.46	3.Had painful aches
0.83	0.60	4.Found it uncomfortable to eat food
0.86	0.47	5.Been self-conscious
0.84	0.50	6.Felt tensed
0.84	0.47	7.Diet has been unsatisfactory
0.82	0.68	8.Had to interrupt meals
0.83	0.56	9.Found it difficult to relax
0.83	0.57	10.Been a bit embarrassed
0.84	0.40	11.Been a bit irritable
0.84	0.52	12.Had difficulty doing usual jobs
0.84	0.55	13.Felt life, less satisfying
0.83	0.57	14.Been totally unable to function

**Table 2:** Comparison of OHIP scores according to selected oral conditions

P value	Median	Mean ( $\pm$ SD)	n	Characteristic
<0.001	15	17.7(10.5)	247	Referring to a dentist in the last year
	10	12.7(9.4)	153	Yes No
<0.001	15	16.6(9.1)	168	Self-reported oral health
	11	14.4(10.5)	142	Poor or very poor
	8	11.2(10.4)	90	Fair Good or very good
<0.001	14	16.0(10.0)	301	Perceived need to dental treatments
	8	10.5(9.5)	99	Yes No
<0.001	15	17.0(9.8)	182	Number of teeth
	10	12.7(10.1)	218	Fewer than 25 25 or more

## **Discussion**

To validate the Persian version of the OHIP-14 and to evaluate the three measurement properties (validity, reliability, and responsiveness), the original English version of the OHIP-14 was translated into Persian. The limitation to our research was problematic, as the survey was based on a random sample of general dental health patients who were only registered in cases of emergency. Therefore, the samplings had some irregularities. One hundred percent of the response rate in our study showed that the interviewer had made sure that the respondents understood the questions.

In our study, the reliability of the instrument evaluated in terms of the internal consistency, using Cronbach's alpha coefficient, was found 0.85, that exceeded the standard criterion of 0.7, deemed minimally reliable (16). Montero-martin et al, in validation of the Spanish version of the OHIP-14 the Cronbach's alpha coefficient considered 0.89 excellent (17). The coefficient was also reported to be: 0.93 in Sri Lanka, 0.93 in China, 0.88 in Israel and 0.87 in Scotland (8, 11-13).

In our investigation, the values of OHIP Cronbach's alpha coefficient had a range of 0.82-0.86 for the seven subscales which was higher than the values obtained from the German (0.65-0.92), Scottish (0.3-0.75) and Hebrew versions (0.48-0.76) (9, 11,13).

The item-scale correlations of the 14 items in our study showed that none of them was less than the minimum acceptance of 0.4. This indicated a good homogeneity and that no item-elimination was necessary from the translated scale. It was proved to be close to the validation of Sinhalese and Chinese versions of the OHIP-14 (9, 12).

The ICCs range of the test-retest reliability for the seven subscales in our study was (0.8-0.93). This was higher than the versions of Scottish (0.72-0.78), Sri Lanka (0.53-0.8) and German (0.72-0.87) but lower than the Swedish version (0.87-0.98) of the OHIP-14 (8-10, 13). The study spent a follow-up period of 1 yr in Scotland. Some researchers speculated that long intervals between the test and the retest, caused a low ICC. John et

al. showed that a 1-month reference period yields the highest ICC and the narrowest limits of agreement as compared to a 1 yr period (9, 13). This conclusion was similar to our study since our test-retest period was also 1-month.

There was a significant relationship between the OHIP scores and the perceived oral health status (referring to a dentist in last year, self reported oral health, perceived need to dental treatments and number of the teeth) that was similar to the validation of the Sinhalese, the Chinese and the Swedish versions of the OHIP-14 (8, 10, 12).

Other different oral conditions (e.g. the number of decayed teeth, bleeding on probe, use of mouthwashes, brushing, flossing and oral satisfaction) were used in the previous studies for the construct validity of the translated scale (11, 13, 17).

We assessed the responsiveness of the OHIP-14 scale for detection of its sensitivity to the clinical changes. The SRM was measured as 0.67, which was an indication that the large effect in clinical change was in moderation (17). We found responsive assessment only in Scottish and German version validation of the OHIP-14 scale (9, 13). Our clinical intervention for assessing the responsiveness was dental extraction. In Scotland, researchers found this property for patients who reported with symptoms associated with the impacted third molar. In Germany, 67 patients were treated for their temporo-mandibular disorder pain (13, 9).

For a better understanding of OHIP, extended studies are required to distinguish the relationship between OHIP and clinical oral health indicators such as periodontal disease among different age groups. Moreover, the relationship between OHIP and health related quality of life should also be tested in further studies (15, 18).

In conclusion, the study revealed that the translated instrument met the standard criteria for reliability, validity, and responsiveness. Hence, the Persian translation of the OHIP-14 scale could be considered as a scientifically sound instrument to measure oral health related quality of life in Iranian population.

## Ethical Considerations

Ethical issues Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc. have been completely observed by the authors.

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