

Validation of a Hebrew Version of the Oral Health Impact Profile 14

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Abstract

Objective: This study determined the validity of a Hebrew version of the Oral Health Impact Profile in a cross-sectional study of a general dental practice in Israel. **Methods:** The original English version of a short-form oral health impact profile (OHIP-14) was translated into Hebrew using the back-translation technique. Participants were interviewed and examined clinically by a calibrated dentist. Information on the subjects' sociodemographic background and oral health conditions was collected. **Results:** A total of 142 persons were interviewed and clinically examined. The Cronbach's alpha and the standardized item alpha for OHIP-14 were both 0.88. Cronbach's alpha of the translated OHIP-14 subscales ranged from 0.48 to 0.76. Construct validity of the translated Hebrew version was supported by the finding that the total OHIP score correlated with the number of decayed teeth, missing teeth, need for prosthodontic treatment, and pattern of dental attendance. Participants with oral pain were more likely to report impact on one of the OHIP subscales and to have more impacts than participants who were pain free. **Conclusions:** The Hebrew version of OHIP-14 presented acceptable validity and reliability. Further research is needed to assess the value of this measure in Israel. [*J Public Health Dent* 2004;64(2):71-75]

Key Words: oral health, quality of life, validity, reliability.

There has been a shift away from viewing health in terms of survival, through the era of defining it as freedom from disease, toward an emphasis on the quality of life of the individual. This "health-related quality of life" can encompass the ability to perform daily activities, and considers those aspects of happiness and social and emotional well-being that health and disease may affect.

Concepts of oral health have changed in keeping with this tendency (1). At a biological level, the oral cavity contributes to quality of life by protecting the body from systemic infection, and by chewing and swallowing (2). At social and psychological levels the oral cavity contributes through self-esteem, self-expression, communication, and facial esthetics. When oral health is compromised, overall health and quality of life may be diminished. Oral health has been defined as a "comfortable and functional dentition

which allows individuals to continue in their desired social role" (3).

Traditional measures of oral status do not reflect these paradigms. The decayed, missing, and filled tooth index (DMF) and the Community Periodontal Index of Treatment Needs (CPITN) "tell us nothing about the functioning of either the oral cavity or the person as a whole, and nothing about subjectively perceived symptoms such as pain and discomfort" (4). Cohen and Jago (5) argued that clinical measures of oral health would be greatly improved by considering these kinds of social impacts. Disruption in normal social functioning (the social role theory) was proposed as a basis for measuring the impact of dental ill health (6).

Subsequently, Locker (7) developed a new conceptual framework for oral health based on the concepts of impairment, disability, and handicap (Figure 1) (8-10). Measures based on

this concept ("sociodental indicators" or measures of oral health-related quality of life (OHQoL)) measure "the extent to which dental and oral disorders disrupt normal social functioning and bring about major changes in behavior such as inability to work, attend school, or undertake parental or household duties" (4).

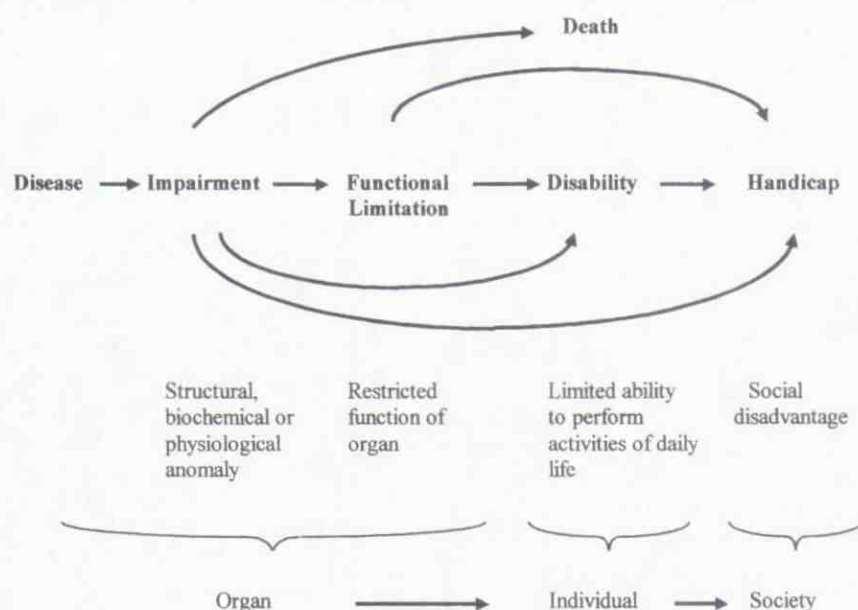
OHQoL measures have three types of applications: political, theoretical, and practical (11). Political applications include the use of OHQoL data when seeking resources for oral health services. OHQoL becomes more relevant to policy makers by demonstrating the importance of oral health to people's lives (5). Moreover, using OHQoL measures may be one way of harnessing public opinion in service planning (4).

Theoretical applications of OHQoL measures include identification of risk factors for various oral conditions and factors implicated in the promotion of health and well-being. The OHQoL data may be useful in exploring models of oral health to enhance understanding of disease, illness, and health.

Practical applications of OHQoL might include research, public health, and clinical practice. In research, OHQoL can be used to evaluate the effectiveness and efficiency of health care by demonstrating gains in function and psychological well-being in individuals and communities (12). In public health practice, OHQoL measures have a role in describing and monitoring the burden of illness in populations, and to prioritize and plan services (13,14).

The value of OHQoL measures in clinical practice is their focus on the patient's subjective view in his or her terms. The use of OHQoL therefore facilitates communication and understanding and assists patient participa-

FIGURE 1
Conceptual Model of Oral Health



tion in treatment. This may improve patient compliance, as well as the effectiveness of the treatment (4,15). In so doing, OHQoL data may help health professionals to understand the patient's experience of oral illness, and their expectation and propensity to adopt health-directed behaviors (13). The course of an individual patient's illness and changes in health status due to interventions can also be monitored with OHQoL, providing a tool for evaluating the quality of care (11,16). Finally, OHQoL can be used to market dental services by highlighting the ability of a treatment to improve quality of life.

A number of OHQoL measures have been developed (17). Among the most widely used is the Oral Health Impact Profile (OHIP) (18), which measures individuals' perceptions of the social impact of oral disorders on their well-being. Based on Locker's model (7), it captures seven dimensions of oral health: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. Participants are asked to recall how frequently they have had each impact during a specific reference period on a five-point Likert scale: never, hardly ever, occasionally, fairly often, and very often.

The original version of the OHIP had 49 questions and took approximately 17 minutes to complete (18).

Therefore, a shortened 14-question version (OHIP-14) was devised that had good reliability, validity, and precision in Australia, the United States, the United Kingdom, and Myanmar (17,19,20).

Health-related quality of life is related to the way an individual interacts with society; it is therefore intricately linked to the culture of that society. A Medline search revealed no descriptions of the social impact of oral conditions among people in Israel. Furthermore, linguistic translation of such a measure may also change its meaning. For these reasons, the measures should be tested before they are used in a new culture and language to assess whether they are valid and reliable measures of health-related quality of life. This study aimed to assess the impacts of oral conditions among a group of patients attending a Rishon Lezion general dental practice and to assess the reliability and validity (in terms of linguistic equivalence) of a Hebrew translation of OHIP-14 for use in similar groups.

Methods

This cross-sectional validation study involved both questionnaires and clinical examinations. Data were collected from a consecutive sample of patients aged 18 years and older who visited a general dental practice in the Rishon Lezion area of Israel between

December 1, 1999, and May 1, 2000. The practice is open 24 hours per week; the patients come from a middle-class area in Rishon Lezion.

The self-completed questionnaire inquired about social and demographic variables and oral health-related quality of life, including: sex, age, possession of dental insurance (dichotomized by whether the participant did or did not have insurance at the time of the examination), pain, and dental attendance pattern (dichotomized by whether or not the participants said they visited a dental clinic annually for a dental check-up).

OHIP-14 was translated into Hebrew using the back-translation technique, in which the original version was translated into Hebrew by one of the researchers (DK). Language experts who were not aware of the intent and concepts underlying the material then translated the Hebrew version back into English. The original and back-translated versions were found to be identical.

The clinical variables included: wearing dentures, the need for dentures, the number of missing and decayed teeth, and the need for pulp care. Data on periodontal status were collected using the CPI index (21). The protocol, indices, and the standards of clinical diagnosis were in accordance with the WHO survey methods (22). Pain was assessed by asking each patient if he or she had suffered from toothache or oral pain during the previous six months. The examiner (DK) was trained and calibrated in the Division of Dental Health of the Israeli Ministry of Health.

OHIP-14 data were summarized in three ways:

- The prevalence of impact was defined as the proportion of participants who reported any impact fairly often or very often.

- The OHIP-14 total score was calculated using the unweighted method (23), which simply sums the item response codes. This method has been found to provide relationships similar to those of the weighted method, but to be more straightforward (19,23).

- Finally, the "simple count method" was used to record the number of impacts each participant reported as "fairly often" or "very often."

Psychometric aspects of reliability relate to the internal consistency of an

instrument. Internal consistency or homogeneity is the degree to which the items of an instrument measure the same attribute. Items should be moderately correlated with each other and with the total score. Item-total correlation refers to the correlation of an individual item with the scale total excluding that item, and should be above 0.20 (24). Cronbach's alpha calculates the average reliability of all possible combinations of splitting the instrument in half. Cronbach's alpha should not increase significantly when a specific item is omitted. Values between 0.70 and 0.90 are acceptable for group comparisons in clinical studies (24).

The validity of a scale is the extent to which it measures what it is intended to measure. The face validity indicates whether, on superficial examination, the instrument appears to be assessing the desired qualities. The content validity considers whether the instrument encompasses all the relevant or important contents or domains by assessing the relevance of each item, the content area, the number of items and the characteristics of the study population. Face and content validity were assessed by the authors in relation to the experience of oral health and disease in Israel.

Criterion validity assesses the performance of the measure against another measure of the same concept. No "gold standard" measure of OHQoL exists, but OHIP-14 scores were compared between patients who did and those who did not report dental pain during the last six months.

Construct validity is assessed by observing if the scores from the instrument correspond with a theoretical model of the construct. In this study, construct validity was assessed by measuring the association between OHQoL and clinical status and dental treatment needs, again expecting modest correlations. One aspect of construct validity is that the measure should not correlate with unrelated factors. Comparing OHQoL scores with sociodemographic variables assessed this "discriminant validity."

Results

Between December 1, 1999, and May 1, 2000, out of a total of 389 patients who visited the practice, 211 agreed to take part in the research (54.2% response rate). Sixty-nine patients spoke Russian as their first lan-

guage. We present the data only for the 142 participants who could complete the questionnaire in Hebrew.

Of the 142 participants, 78 (54.9%) were women. The mean age was 36.3 years (SD=13.6) and the mean number of years of education was 12.4 (SD=2.0). Eighty (56.3%) had no dental insurance and 51 (35.9%) described themselves as regularly receiving dental check-ups. One-quarter (26.8%) reported pain from their teeth.

On clinical examination, all participants had most of their teeth. Many patients experienced dental caries: almost half of the participants (46.5%) had missing teeth and 69.7 percent had one or more teeth with dental caries (Table 1), 59.1 percent of patients had a highest CPI score of 3 and 4 (36.6% and 22.5 percent, respectively) and only 16.2 percent had a highest score of 0 (Table 1).

One-fifth of the patients (21.1%) reported one or more impacts at the threshold of "fairly often" or "very often." The frequency distribution for the number of impacts is presented in Figure 2. Of those patients with impact, 9.2 percent reported only one impact.

Table 2 presents the proportion of participants reporting an impact in each OHIP-14 subscale and the mean scores of each subscale among those who had an impact. Physical pain and psychological disability were the most commonly reported subscales. Among those with impacts, the physical pain and handicap subscales were affected most frequently.

The Cronbach's alpha and the standardized item alpha for OHIP-14 were both 0.88. Alpha for each subscale of OHIP-14 ranged from 0.48 to 0.76. Corrected item-total correlations

varied between 0.31 and 0.72, and values for alpha if an item was deleted ranged from 0.86 to 0.88. Face and content validity were assessed by the authors in relation to the experience of oral health and disease in Israel.

The criterion validity of OHIP-14 was assessed by comparing the number of impacts and total scores among participants with a history of dental pain. Participants with pain were more likely to report an impact (39.5% vs 14.4%; $P<.01$, chi-square) and to have more impacts (4.7 vs 3.5; $P=.04$, Mann-Whitney U test). Total OHIP score correlated directly with pain experience (0.9 vs 0.6; $P<.05$, Mann-Whitney U test).

Presence of impact was associated with number of decayed teeth ($P<.05$), but was not associated with high CPI

TABLE 1
Clinical Findings Among 142
Hebrew-speaking Dental Patients

Clinical Variables	Mean $\pm$ SD
Mean number of decayed teeth	2.4 $\pm$ 2.8
Mean number of missing teeth	2.8 $\pm$ 3.2
	% of Patients
Wearing removable prosthesis	7.1
Need for denture	11.3
Highest CPI score	
0	16.2
1	8.5
2	12.7
3	36.6
4	22.5

FIGURE 2
Frequency Distribution of Number of Oral Impacts Among 142 Dental Patients

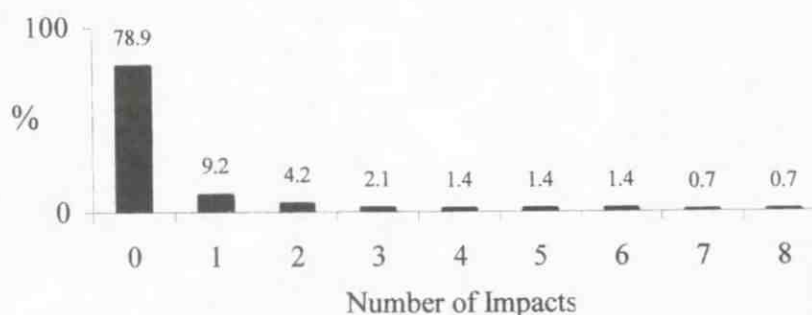


TABLE 2
Proportion of Participants Reporting Impact in Each OHIP-14 Subscale and Mean Scores of Each Subscale Among Those Who Had an Impact

OHIP Domain	Proportion w/ Impact (%)	Scores in Those w/ Impact (Mean $\pm$ SD)
Functional limitation	2.1	0.25 $\pm$ 0.49
Physical pain	13.4	1.08 $\pm$ 0.85
Psychological discomfort	8.5	0.73 $\pm$ 0.93
Physical disability	4.9	0.64 $\pm$ 0.75
Psychological disability	9.9	0.64 $\pm$ 0.81
Social disability	4.2	0.38 $\pm$ 0.67
Handicap	3.5	0.32 $\pm$ 0.62
Total OHIP score	11.1	0.68 $\pm$ 0.58

TABLE 3
Presence of Impact and Total Score in Relation to Denture Need, Need for Pulp Care, Experience of Pain, and Dental Attendance

	% w/ Impact	P (χ^2)	Total Score	P*
Clinical Variables	37.5	.089	0.91 $\pm$ 0.47	.022
Needs denture				
Does not need denture	19.0		0.65 $\pm$ 0.58	
Needs pulp care	21.5	.692	0.73 $\pm$ 0.61	.829
Does not need pulp care	16.7		0.68 $\pm$ 0.58	
Questionnaire variables				
Experienced pain	39.5	.001	0.9 $\pm$ 0.74	.025
Did not experience pain	14.4		0.6 $\pm$ 0.49	
Regular check-ups	11.5	.041	0.61 $\pm$ 0.60	.119
Irregular check-ups	26.4		0.73 $\pm$ 0.57	

*Mann-Whitney U test

scores or the number of missing teeth. Total OHIP score was correlated with the number of missing teeth ($r=.26$, $P<.01$) and decayed teeth ($r=.20$, $P<.05$). There was no association between high CPI scores and total OHIP score. The number of impacts was correlated with number of decayed teeth ($r=0.14$, $P<.05$). Participants deemed to require prosthodontic treatment had higher total OHIP-14 scores, and were twice as likely to report an impact (Table 3). The number of impacts was also higher in these patients (0.75 vs 0.53, $P<.05$). While more impacts and higher total scores were seen in patients who needed pulp care, neither relationship was statistically significant.

Patients with impacts were of similar age to those with no impacts (mean age=32.8 years, SD=13.0 years vs 37.2 years, SD=13.6 years; $P=.68$) and had

similar numbers of years of education (11.9 years, SD=1.4 years vs 12.5 years, SD=2.1 years; $P=.14$). Total scores were not related to age ($r=-.02$, $P=.71$), but correlated with lower levels of education ($r=-.16$, $P=.022$). OHIP detected more impacts in people with nonregular dental attendance ($P<.05$). No sex difference was found using two OHIP summary measures: total score (0.53 male vs 0.55 female; $P>.05$) and number of impacts (10.0 male vs 12.8 female; $P>.05$).

Discussion

This study aimed to assess the impacts of oral conditions among a group of patients with high disease and treatment experience attending a Rishon Lezion dental practice and to validate a measure of oral health-related quality of life for use in similar groups.

Slightly more than one-fifth of the participants reported that their oral condition had an impact on their every day life, at least fairly often. Almost half of those who reported an impact reported only one. The most common impacts were physical pain and psychological disability. Greater impact was directly related to the number of missing teeth, but not to the periodontal condition or the number of decayed teeth. Total OHIP-14 scores were associated with measures of clinical status, including number of decayed teeth, number of missing teeth, and the need for prosthodontic care. Experience of dental pain was associated with all three summary measures of OHIP-14. The only other factors associated with summary measures of OHIP-14 were educational attainment with the total score and dental attendance with the number of impacts.

With the slightly low response rate in this study (54.2%), these data should not be assumed to be representative of a wider population. There were fewer impacts among this sample than seen in patients attending an emergency dental clinic in London (89%), but similar in number to those seen among older people in Canada (19%) (18,19,26). Differences not only between the clinical status, but also between the cultures of participants in these and the present study prevent firm conclusions being drawn.

The reliability of OHIP-14 was acceptable. The item-total correlation should be above 0.20 and Cronbach's alpha should be above 0.70 for comparisons between groups (23). These values are comparable to those obtained in the UK (19), Myanmar (20), and Australia (25). Values of alpha did not increase if individual items were deleted. We conclude that OHIP 14 was acceptably homogeneous in this population.

The face validity and content validity of the OHIP-14 are likely to be acceptable because it has been developed on a well-tested theoretical model. The criterion validity of OHIP-14 for use in this group of patients was confirmed by the associations between the presence of impact and total scores with a history of pain. This finding is unsurprising, since the most common impact reported by participants was physical pain (Table 2).

The construct validity of OHIP-14 was assessed by comparing the preva-

lence of impact and total scores against clinical variables and dental attendance (convergent validity) and demographic variables such as sex and educational status (discriminant validity) variables. The measure demonstrated acceptable convergent validity based on the hypothesis that impaired oral health clinical status would have lower oral health-related quality of life. Two methods of OHQoL scoring (total score and presence of impact) were associated with number of decayed teeth ($P < .05$) and requirement for prosthodontic treatment ($P < .05$). The effects of impaired denture status on OHQoL has been reported (26).

Despite being more common among patients with more missing teeth, and twice as frequent in patients needing pulp care, impacts were not significantly associated with either clinical condition. The possible explanation may be that the study population was relatively young and the mean number of missing teeth in the sample was small (only 2.8). Conversely, the periodontal condition and the need for pulp care are often asymptomatic and so might not be expected to cause an impact on the quality of life.

In addition, convergent validity was assessed by association between OHQoL impact and nonregular dental attendance. The value of regular dental attendance in terms of quality of life has been reported (27). Frequent and nonemergency dental visits are associated with enhanced oral health-related quality of life. In our study, people with nonregular dental attendance reported significantly more OHQoL impacts ($P < .05$) and presented higher total OHIP scores (however, the difference was not statistically significant).

In general, impacts were neither related to the sex nor to educational status. Total OHIP-14 score was significantly correlated with lower levels of educational attainment ($P < .05$); however, in this case, low socioeconomic status and related impaired oral health may have confounded this association (28). Moreover, with some nine analyses of divergent validity, there is a risk of type one error. In general, the construct validity of the measure was acceptable.

The findings of this study should be treated with caution for several rea-

sons. The nature of the study sample may limit the generalizability of the findings within Israel. The response rate was not high and therefore prevalence of impacts cannot be assumed to be representative of a population in general. However, the relationships between the variables are unlikely to be affected by the small amounts of sampling bias potentially present in the data. Israel has a heterogeneous population and therefore the OHIP-14 will require testing in other age and ethnic groups. Additional work is required to assess the usefulness of OHIP-14 in Israel. It was not possible to investigate the test-retest reliability of OHIP in this sample seeking dental treatment. This assessment would have required that treatment be delayed for several weeks before administering the instrument on a second occasion. Further research should assess the responsiveness of OHIP-14 to changes in oral health-related quality of life brought about by changes in clinical status.

In conclusion, OHIP-14 appeared to have acceptable reliability and validity to assess the oral health-related quality of life among a Hebrew-speaking sample of Rishon LeZion adults. Further research is justified to assess value of this and other OHQoL measures in Israel so that they may be used more widely to assess the impact of oral conditions to prioritize, plan, and evaluate services.

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