Translation and validation of the Croatian version of the Oral Impacts on Daily Performances (OIDP) scale

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ORIGINAL ARTICLE

UDC: 001.8:[613:616.31
DOI: 10.2298/VSP140829136L

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Prevođenje i valjanost hrvatske verzije Upitnika o uticaju oralnog zdravlja na dnevne aktivnosti

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Abstract

Background/Aim. Among numerous sociodental indicators the Oral Impacts on Daily Performance (OIPD) is one of the most broadly applied. The aim of this study was to develop and test psychometric properties of a Croatian version of OIDP scale. **Methods.** The OIDP instrument was translated from English to Croatian in a forward-backward method. The Croatian version was tested for reliability, construct validity and responsiveness on a sample of 702 participants (255 men), aged 18–86 years. **Results.** Internal consistency of Croatian version of the OIDP was acceptable (alpha = 0.80) and 69.4% of the examinees had oral impacts relating to one or several performances. The most frequently affected performance was eating (53.7%). The test-retest reliability was high (r = 0.99; 95% CI: 0.97–0.99), the mean difference between the OIDP summary scores in two-week interval was not statistically significant. In construct validity testing there was statistically significant correlation between OIDP and self-assessed general and oral health, somatisation, depression and Oral Health Impact Profile ranging from 0.157 to 0.516. Responsiveness was confirmed by a significant reduction of oral impacts on daily performances in subjects before and after treatment of acute dental pain ($p < 0.001$). **Conclusion.** The Croatian OIDP index showed good psychometric properties in terms of construct validity, internal consistency, test-retest reliability and responsiveness confirming its appropriateness for use among Croatian population.

Key words:
oral health; attitude to health; quality of life; questionnaires; croatia.

Apstrakt

Uvod/Cilj. Među mnogobrojnim sociodentalnim pokazateljima Upitnik o uticaju oralnog zdravlja na dnevne aktivnosti (OIDP) najšire se primenjuje. Cilj istraživanja bio je da se razviju i testiraju psihometrijske karakteristike hrvatske verzije OIDP. **Metode.** Upitnik OIDP preveden je s engleskog na hrvatski jezik metodom napred-natrag. Proverena je pouzdanost, verodostojnost i osetljivost hrvatske verzije na uzorku od 702 ispitanika (255 muškaraca), starih od 18 do 86 godina. **Rezultati.** Interna konzistencija hrvatske verzije OIDP upitnika bila je prihvatljiva (alpha = 0,80) i 69,4% ispitanika imalo je oralni uticaj na jednu ili više aktivnosti, s tim da je uticaj bio najviše ispoljen na jedenje hrane (53,7%). Test-retest pouzdanost bila je vrlo visoka (r = 0.99; 95% CI: 0.97–0.99), a glavna razlika između OIDP zbirnih rezultata u dvonedeljnom intervalu nije bila statistički značajna. U ispitivanju valjanosti upitnika (prevoda upitnika) postojala je statistički značajna povezanost između OIDP i samoprocene opšteg i oralnog zdravlja, somatizacije, depresije i profila uticaja oralnog zdravlja u rasponu od 0,157 do 0,516. Osetljivost upitnika potvrđena je značajnim sniženjem uticaja oralnih činilaca na izvođenje svakodnevnih aktivnosti pre i nakon tretmana akutnog dentalnog bola ($p < 0,001$). **Zaključak.** Hrvatska verzija OIDP pokazala je dobre psihometrijske karakteristike u smislu valjanosti izrade upitnika, interne konzistencije, test-retest pouzdanosti i osjetljivosti, potvrđujući njegovu prikladnost za upotrebu među domaćim stanovništvom.

Ključne reči:
usta, zdravlje; stav prema zdravlju; kvalitet života; upitnici; hrvatska.

Introduction

Oral health related quality of life (OHRQoL) has been recognized as a multidimensional construct containing not only physical but also psychosocial issues [1–3]. A professional can diagnose physical state, but not psychological or social wellbeing, which can only be assessed through indicators of oral impacts on daily performances and quality of life [1]. Their use provides important information on functional and social dimensions of oral conditions. This information reflects

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the self-perceived oral health needs. So far many OHRQoL measures are developed, validated and used: Oral Health and the Sickness Impact Profile; The Dental Impact Profile, The Oral Health Impact Profile, The Dental Impact on Daily Living, Subjective Oral Health Status Indicators, etc [1].

Among numerous sociodental indicators the Oral Impacts on Daily Performance (OIDP) is one of the most broadly applied. It uses a theoretical concept modified from International Classification of Impairments, Disabilities and Handicaps of World Health Organization which has three levels: oral status and impairments, intermediate impacts (pain, discomfort, functional limitations and dissatisfaction with appearance), and ultimate impacts (psychosocial and physical disability and handicap) [1]. While the majority of OHRQoL instruments focus on measuring the second level, the OIDP puts emphasis on the third level in order to determine oral impacts on the ability to perform everyday activities. Its simplicity, short form and good psychometric characteristics make it easy to use in a wide range of age groups and cohorts [4–7].

The OIDP is a generic instrument, used in many studies to assess the impact of oral health on quality of life before and after different dental treatment [8–12]. The results showed that the impact of oral health on quality of life decreased with time after treatment, indicating improvement in QoL, although these effects may be better traced by condition-specific instruments.

In this study, the English version of OIDP was translated into Croatian and validated, in order to provide the basis for further application on Croatian population.

Methods

The translated instrument was tested on a sample of 702 participants (255 men and 447 women) aged 18–86 years (mean age 41.2 ± 19.6). Sampling procedure included convenient sample: students, workers, subjects at regular annual check-ups at the Institute for Public Health Rijeka, consecutive voluntary blood donors at the Department of Transfusion, Medicine University Hospital Rijeka and patients of the University Dental Clinic, during the year 2011. All the participants gave written informed consent to the survey procedures, approved by the Institutional Review Board of the Rijeka University School of Medicine. The questionnaire was self-administrated.

The OIDP index measures oral impacts on eight performances, *ie* eating, speaking, cleaning teeth/denture, sleeping and relaxing, emotional stability, smiling, carrying out main role/everyday activities, social contacts. The development of the Croatian OIDP demanded a cross-cultural adaptation. Linguistic validation comprised forward translation of the English OIDP instrument into Croatian, followed by backward translation of the draft Croatian version into English. OIDP was first translated into Croatian independently by two dentists who were experts in quality of life measures and proficient in English and Croatian. After a panel discussion of four dental specialists, the first draft of translation was formed. To check the clearness of the items in a Croatian linguistic and cultural context, 20 subjects (students and patients) administrated the questionnaire, and according to their remarks few linguistic modifications were thereafter done. Croatian version was then translated back into English independently by a dental postgraduate student and an English major student. After the back translation, a native speaker and a dentist fluently in English checked the meaning of items of original instrument and back-translated Croatian version resulting in a final version approved by the panel.

For each dimension performance score was calculated as a product of severity and frequency score. The OIDP score was calculated by the formula: OIDP score = sum of performance scores / maximum possible score X 100. Respondents also graded the impact for the following oral problems on their daily activities: toothache, sensitive tooth, tooth decay, tooth space due to non-erupted permanent tooth, fractured tooth, tooth colour, tooth shape or size, position of tooth, bleeding gum, swollen gum, calculus, oral ulcers, bad breath, deformity of mouth or face, eruption of permanent tooth, missing permanent tooth. The Likert scale was used ranging from 0 = not at all to 5 = a great deal. The questionnaire also included questions referring to the self-reported general health as well as oral health (based on a five-point Likert scale ranging from 1 = excellent to 5 = poor). Oral Health Impact Profile (OHIP)-14 CRO [2], and somatisation and depression domains of the Brief Symptom Inventory (BSI) were also administrated [13, 14]. It was assumed that respondents with higher OIDP score would have lower self-reported general and oral health, higher level of somatisation and depression, and higher OHIP. OHIP-14 CRO was used as a gold standard for OHRQoL assessment, since it showed good psychometric characteristics in Croatian population [2].

The internal consistency and the test-retest reliability were used as a measure of instrument's reliability. The internal consistency was assessed by calculating the average inter-item correlation and the Cronbach's alpha for the OIDP subscales and summary score. The test-retest reliability was calculated by intra-class correlation coefficients (ICC) using summary OIDP scores from the repeated administration of the questionnaire. The same instrument was administered by 41 subjects twice within a two-week period by respondents who were not provided by any oral or dental treatment, assuming that the OHRQoL would not change during that period.

Construct validity was evaluated by assessing association between the OIDP summary score and OHIP-14 CRO, self-reported general and oral health, and somatisation and depression levels by using the Spearman rank correlation and ANOVA.

The responsiveness of the OIDP was tested on 34 patients suffering from toothache who completed the OIDP questionnaires before the treatment and one month later. It was predicted that the OHRQoL would improve within that period. The significance of the difference in the OIDP score was assessed by using paired samples *t*-test, the standardized response mean and the effect size.

Results

The prevalence of oral impacts on daily performances was high and 69.4% of respondents experienced at least one impact in the last six months, with speaking being the least frequently

affected and eating the most (Table 1). Sensitive teeth were the most frequently reported oral problem (61.5%; impact 1.0 ± 1.0), followed by tooth position (54.6%; impact 1.1 ± 1.2), and mouth /face deformity was the least (4.6; 0.1 ± 0.7; Table 2).

Internal consistency of the Croatian version of OIDP was acceptable, which was shown in standardized Cronbach's alpha of 0.80. None of the items would substantially affect reliability of the OIDP if they were deleted (Table 3). All correlations between OHIP domains were positive, average inter-item correlation was 0.33 and ranged from 0.18 (speaking and social contacts) to 0.81 (smiling and social contacts).

The test-retest reliability was high (r = 0.99; 95% confindence interval (CI): 0.97–0.99), the mean difference between the OIDP summary scores in two-week interval was -0.53 (95% CI: -1.20–0.14) and was not statistically significant.

Regarding construct validity, there was a statistically significant correlation between OIDP and self-assessed general and oral health, somatisation, depression and OHIP, ran-

Table 1

Prevalence of oral impacts on daily performances

Performance	Prevalence (≥ 1), %
Eating (jelo i uživanje u hrani)	53.7
Speaking (govor i jasno izgovaranje)	23.4
Cleaning teeth/denture (čišćenje zubi ili proteza)	39.8
Sleeping and relaxing (spavanje i odmaranje)	32
Emotional stability (održavanje emocionalnog stanja bez razdražljivosti)	30
Smiling (smijanje i pokazivanje zubi bez srama)	40.8
Carrying out main role/everyday activities (izvođenje svakodnevnih aktivnosti)	26.8
Social contact (uživanje u kontaktima s drugim ljudima)	32.1
Any impact	69.4

Table 2

Prevalence of self-reported oral conditions and their impacts on daily activities

Oral conditions	Prevalence (≥ 1), %	Impact	
		mean	SD
Toothache (zubobolja)	45.9	0.8	1.1
Sensitive tooth (osjetljivi zubi)	61.5	1.0	1.0
Tooth decay (pokvareni zub)	36.0	0.7	1.2
Tooth space due to non-erupted permanent tooth (prazno mjesto za zub (jer nije niknuo trajni zub))	9.7	0.2	0.7
Fractured tooth (slomljen trajni zub)	15.8	0.4	1.0
Tooth colour (boja zuba)	38.6	0.7	1.1
Tooth shape or size (oblik ili veličina zuba)	28.0	0.5	0.9
Position of tooth (položaj zuba (npr. krivi / zbijeni ili izbočeni / stršeći, razmaknuti / razdvojeni))	54.6	1.1	1.2
Bleeding gum (krvarenje desni)	44.7	0.8	1.0
Swollen gum (otečene desni)	33.5	0.6	1.0
Calculus (kamenac)	31.3	0.5	0.9
Oral ulcers (ranice u ustima)	41.9	0.8	1.1
Bad breath (zadah)	44.6	0.8	1.1
Deformity of mouth or face (deformitet usta ili lica (npr. rascjep usne ili nepca))	4.6	0.1	0.7
Eruption of permanent tooth (nicanje trajnog zuba)	26.9	0.6	1.1
Missing permanent tooth (nedostaje trajni zub)	10.1	0.2	0.8

SD – standard deviation.

Table 3

Internal consistency of Croatian version of Oral Impacts on Daily Performance (OIDP) questionnaire

Parameter	Corrected item-total correlation	Cronbach's alpha if item deleted
Eating	0.50	0.74
Speaking	0.40	0.76
Cleaning teeth/denture	0.41	0.76
Sleeping and relaxing	0.49	0.75
Emotional stability	0.46	0.75
Smiling	0.54	0.74
Carrying out main role/everyday activities	0.56	0.75
Social contact	0.61	0.72

Alpha: 0.77; Standardised item alpha: 0.80.

ging from 0.157 for general health to 0.516 for OHIP (Table 4). There was an evident tendency for increasing OIDP with increasing level of self-perceived dental treatment need, somatisation and depression, and decreasing self-perceived oral health (Table 5).

A significant difference between the mean OIDP score in subjects before and after treatment of acute dental pain confirmed responsiveness ($p < 0.001$) (Table 6).

Table 4

Construct validity of Oral Impacts on Daily Performance (OIDP) questionnaire assessed by Spearman's rank correlation

Parameter		OIDP
Self-perceived general health	*r*	0.157
	p	0.044
Self-perceived oral health	*r*	0.356
	p	< 0.001
Self-perceived dental treatment need	*r*	0.446
	p	< 0.001
Somatisation	*r*	0.318
	p	< 0.001
Depression	*r*	0.273
	p	0.002
OHIP	*r*	0.516
	p	< 0.001

OHIP – Oral Health Impact Profile.

Table 5

Construct validity of Oral Impacts Daily Performance (OIDP) questionnaire assessed by ANOVA

Parameter	Mean	SD	*p*
Self-perceived dental treatment need			
not at all	0.78	2.05	
a little	2.57	3.24	
to some extent	3.60	3.87	
considerably	11.48	15.12	
very much	30.92	26.52	< 0.001
Self-perceived oral health			
excellent	0.80	1.57	
very good	3.57	3.80	
good	4.10	5.49	
fair or poor	7.01	14.44	0.023
Somatisation			
normal (< 0.535)	2.19	4.51	
moderate (0.535–1.105)	2.65	3.51	
severe (> 1.105)	6.48	8.15	0.005
Depression			
normal (< 0.428)	2.23	4.57	
moderate (0.428–0.857)	2.60	3.70	
severe (> 0.857)	7.22	8.27	0.002

SD – standard deviation.

Table 6

Responsiveness testing of Croatian Oral Impacts Daily Performance (OIDP) questionnaire

n	Mean baseline score–mean follow-up score	95% CI for mean difference	Standardized effect size	Standardized response mean	*p*
34	9.21–3.78	3.43–7.44	0.66	0.95	< 0.001

n – number of examinees; CI – confidence interval.

Discussion

This is the first study in which the OIDP index was adapted in Croatian and tested its validity on Croatian population. The development of the Croatian version of the OIDP was performed by following established procedures and the methodology from similar studies [4, 15, 16]. The professionals fluent in both English and Croatian carried out the forward-backward translation process. There are several translation categories usually operating (forward-only translation, forward translation with testing, back-translation, back translation and monolingual test, back translation and bilingual test, back translation and monolingual and bilingual tests) each method presenting some advantages and disadvantages with the last quoted being the most powerful [17]. Inclusion of several translators, panel of professionals and examinees of various groups show significant exertions made into the cross-cultural adaptation of the instrument. The present survey demonstrated that the Croatian version of the OIDP instrument is reliable and valid for use among subjects in

Croatia. Its psychometric attributes in terms of content, criterion and construct validity as well as internal and test-retest reliability underwent successful testing and empirical verification.

Inter-item correlation, corrected item-total correlation, and Cronbach's alpha indicated that this index has excellent internal consistency. All item-total correlations were above the threshold of 0.20, as suggested [18] for including an item in a scale, which implies the homogeneity of the items. Alpha values were above than the recommended limits, and even higher than in other studies [1, 19]. The above mentioned implies that the items of Croatian OIDP instrument are well and positively intercorrelated, therefore appropriate to constitute an unidimensional instrument.

The Croatian OIDP is a generic OHRQoL instrument, measuring a construct most similar to unidimensional short form OHIP-14. Many generic and condition-specific instruments have been developed so far in dental medicine to express how an individual perceives oral pain or discomfort (Graded Chronic Pain Scale, OHIP), jaw function limitations (Jaw Functional Limitation Scale, Mandibular Function Impairment Questionnaire), or his/her dental appearance [Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ), Orofacial Esthetic Scale (OES)], etc. [18–23]. Instruments measuring OHRQoL can be unidimensional (like OES), while the majority are multidimensional (such as PIDAQ).

The Croatian version of OIDP has good construct validity. It is capable to discriminate levels of self-perceived dental treatment need, self-perceived oral health, somatisation and depression. The correlation was poor for self-perceived general health, somatisation and depression, moderate for self-perceived oral health and dental treatment need, and good for OHIP. All the tested relationships between OIDP score and subjective oral health measures demonstrated a trend in the assumed direction. It is logical and expected that OHIP and OIDP are very well correlated because they measure similar construct. It is understandable that the correlation was moderated for self-perceived oral health and dental treatment need because the participants do not connect impaired quality of life with treatment need (they got used to that condition, and probably do not want changes). Also, in Croatia people avoid oral healthcare, thereby reflecting low socioeconomic status. It was not surprising that a correlation was poor for self-perceived general health because they are two kinds of health that participants differentiate. We expected higher correlation with somatisation and depression, but in our sample there were no patients primary with acute or chronic health conditions, such as toothache, that could produce significant psychosomatic symptomatology. And for depression probably in Croatian cultural context people are less aware of their teeth and dental appearance and they do not tend to significantly suffer because of it. All correlations between OIDP domains were positive, average inter-item correlation was 0.33 and ranged from 0.18 (speaking and social contacts) to 0.81 (smiling and social contacts).

The frequency of oral impacts on daily performances was high, which was similar to other researches [5, 6, 16], or even higher [1, 6, 7]. The reason of differences in prevalence may be related to cultural differences. Eating was the most prevalent performance affected by oral impacts among the ten items, and speaking being the least frequently affected, which is consistent with the other research [5–7, 19, 22–24].

The OIDP and OHIP-14 are proved to be valid questionnaires to assess the impacts of oral conditions on quality of life. Both established on the model of oral health which claims that diseases lead to impairment and functional limitation at the level of the organ, and consequently to one's disability, death or social deprivation [3]. The OHIP-14 may be preferred due to its easier administration and somewhat higher reliability [22]. However, OHIP-14 measures the second level of consequences, and OIDP focuses on measuring the third level, still encompasses all of the consequences of the second level impacts in performing daily activities. Specificity of OIDP feature is that it provides a percentual measurement scale [1].

Beside Croatian, the OIDP was cross-culturally adapted from English into many languages [4, 5, 16, 25–31] and also showed good psychometric properties. Its version for children (Child-OIDP) was developed in 2004 [32]. Heretofore several cross-cultural adaptation and validation of Child-OIDP are presented [33–35], and it is one of the most widely used OHRQoL instruments in children.

Future studies should focus on development of Croatian version of the Child-OIDP version.

Conclusion

The Croatian OIDP demonstrated good psychometric properties, establishing itself as appropriate instrument to measure the OHRQoL of Croatian population.

Acknowledgement

This work was supported by University of Rijeka grants No. 13.06.2.1.53. and No. 13.06.1.3.49.

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Received on August 29, 2014.
Revised on April 28, 2015.
Accepted on June 3, 2015.
Online First December, 2015