



Translation to Serbian and transcultural adaptation of the oral health-related quality of life [OHQoL-UK(W)] instrument

Prevod na srpski jezik i kulturološka adaptacija instrumenta za merenje kvaliteta života u vezi sa oralnim zdravljem [OHQoL-UK(W)]

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Abstract

Background/Aim. Measuring health-related quality of life is of great help to clinicians when they have to choose optimal therapy for their patients or estimate its effects. The aim of this study was to translate the oral health-related quality of life [OHQoL-UK(W)] questionnaire from English to Serbian, to make necessary cultural adaptations of the translation, and to test its reliability in a sample of adult Serbian patients. **Methods.** After obtaining permission from the authors, translation and cultural adaptation of the OHQoL-UK(W) was made according to the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) guidelines. Reliability of the Serbian translation was tested on a sample of 250 patients through calculation of Cronbach's alpha, as a measure of internal consistency. **Results.** Serbian translation of the OHQoL-UK(W) had very similar degree of internal consistency (Cronbach's alpha 0.947), and correlated satisfactorily with the visual analogue scale (VAS) score and inversely with the Decay-missing-filled teeth (DMFT) index. Factorial analysis revealed only one factor, as in the original scale. **Conclusions.** Serbian translation of the OHQoL-UK(W) is reliable instrument for measuring oral health-related quality of life in adult dentistry patients.

Key words:

oral health; surveys and questionnaires; serbia; quality of life.

Apstrakt

Uvod/Cilj. Merenje kvaliteta života u vezi sa zdravljem može mnogo da pomogne kliničarima kada biraju terapijsku opciju za svoje bolesnike ili utvrđuju njen efekat. Cilj ove studije bio je da se prevede upitnik za merenje kvaliteta života u vezi sa oralnim zdravljem [OHQoL-UK(W)] sa engleskog na srpski jezik, da načini neophodne izmene zbog kulturoloških razlika, i da testira pouzdanost prevoda na uzorku odraslih bolesnika u Srbiji. **Metode.** Posle dobijene dozvole od autora za prevođenje i kulturološku adaptaciju OHQoL-UK(W) instrumenta, to je učinjeno prema vodiču Međunarodnog društva za farmakoekonomiju i proučavanje ishoda lečenja (ISPOR). Pouzdanost prevoda na srpski jezik ispitana je na uzorku od 250 stomatoloških bolesnika kroz izračunavanje Cronbach-ove alfe, kao mere unutrašnje saglasnosti. **Rezultati.** Prevod OHQoL-UK(W) instrumenta na srpski jezik imao je veoma sličnu vrednost Cronbach-ove alfe (0.947) kao original, a vrednosti prevedenog instrumenta su dobro korelirale sa vrednostima na vizuelnoj analognoj skali (VAS) i inverzno sa vrednostima DMFT (*decayed, missing and filled teeth*) indeksa. Faktorska analiza je otkrila samo jedan faktor, kao što je pokazano i kod originalnog upitnika. **Zaključak.** Prevod OHQoL-UK(W) upitnika na srpski jezik pouzdan je instrument za merenje kvaliteta života povezanog sa oralnim zdravljem kod odraslih stomatoloških bolesnika.

Ključne reči:

oralno zdravlje; ankete i upitnici; srbija; kvalitet života.

Introduction

Measuring health-related quality of life is of great help to clinicians when they have to choose optimal therapy for their patients and estimate its effects¹. During the last few decades several instruments for measuring oral health-related quality of life were developed in English language, like the

General Oral Health Assessment Index (GOHAI) and the Oral Health Impact Profile (OHIP)². One of such instruments is the oral health-related quality of life [OHQoL-UK(W)] questionnaire with 16 items, constructed and validated in adult population of Great Britain³. The OHQoL-UK(W) has high internal consistency (Cronbach's alpha 0.94) and each item asks about opinion of patients about "ef-

fect" (good, bad or none) of oral health on certain aspect of quality of life and "impact" or extent of this effect (none, little, moderate, great or extreme impact on quality of life)^{4,5}.

There are a few instruments for measuring oral health-related quality of life available in Serbian language [e.g. translation of the Orthognatic Quality of Life Questionnaire (OQLQ) and of the Oral Impacts on Daily Performance (OIDP)]^{6,7}. While the first instrument had very good psychometric results, the latter showed minimal internal consistency (Cronbach's alpha was only 0.75), and was tested on small sample with 44 patients only. Besides, the OIDP instrument lacks questions about effect of oral health on professional and financial aspects of quality of life, as well as on self-confidence of the patients⁸.

Increasing number of instruments for measuring oral health-related quality of life available in Serbian language would help clinicians to estimate this important outcome with more precision and adjust their treatment plans accordingly. The aim of this study was to translate the OHQoL-UK(W) questionnaire from English to Serbian, to make necessary cultural adaptations of the translation, and to test its reliability in a sample of adult Serbian patients.

Methods

The instrument

The oral health-related quality of life OHQoL-UK(W) questionnaire is a 16-item questionnaire, and each item asks about opinion of patients about "effect" of oral health on certain aspect of quality of life and "impact" or extent of this effect^{4,5}. The items are rated on a scale from 1 to 9 (1 = extreme bad effect, 9 = extreme good effect). There are no items with reversed scoring within the scale, and total score is calculated by simple summation of scores on individual items, ranging from 16 to 144.

OHQoL-UK(W) translation

Translation and cultural adaptation of the OHQoL-UK(W) questionnaire was made according to the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) guidelines⁹. Permission for translation of the OHQoL-UK(W) questionnaire from English into Serbian was granted by the authors of the original scale (Drs. R. Bedi and C. McGrath)³⁻⁵. The original scale was first translated into Serbian by two independent translators, authors of this article. The final Serbian version was derived from combination of the two independent translations at the meeting of the study investigators. The Serbian version was then translated back into English by Ron Strauss, native English speaker and also fluent speaker of Serbian, citizen of USA and Real Estate Agent, who had not read the original English version of the OHQoL-UK(W).

Back-translation in English was then compared with original English version by the study investigators, and the final Serbian version of the OHQoL-UK(W) was agreed at a new meeting of the investigators. The final OHQoL-UK(W)

translation was then tested on 8 local dentistry patients (at the Oral health primary care facility in Kragujevac, Serbia) for clarity and comprehension. A few minor changes (only punctuation) were made after this preliminary administration and the final Serbian version of the OHQoL-UK(W) was prepared for reliability testing. The whole process of translation was also in accordance with recommendations by Streiner and Norman¹⁰.

Patients

Final Serbian version of the OHQoL-UK(W) was tested for reliability on patients of the Oral health primary care facility in Kragujevac, Serbia, on one occasion, between November 1, 2015 and November 1, 2016. The sample was composed of 250 participants (167 females, 83 males; average age 37.3 ± 17.6 years), as it was minimum number to achieve sufficient statistical power, and it was consecutive, i.e. all patients who visited the facility and satisfied inclusion and exclusion criteria were included. The inclusion criteria were: being in a need of a dental intervention (treatment of dental caries), preserved cognitive capacity and sufficient literacy. The exclusion criteria were age below 18 or above 75 years¹¹ and diagnosis of a major mental disease (major depression, schizophrenia or bipolar disorder).

All of the included participants (250) agreed to fill in the questionnaire. Besides the OHQoL-UK(W) scale, the patients were offered to estimate their oral health on the visual analogue scale (VAS), 10 cm long, with marked millimeters, from 1 to 100. At the same time, values of their decay-missing-filled teeth (DMFT) index was recorded by dentists. The study was approved by the Ethics Committee of the Oral health primary care facility in Kragujevac, Serbia, including the written informed consent forms.

Reliability testing

Reliability of the Serbian translation of the OHQoL-UK(W) was tested by two methods. Firstly, internal consistency was determined through calculation of Cronbach's alpha for the questionnaire as a whole. Secondly, the questionnaire was divided by split-half method to two parts with the same number of questions (8 each), and Cronbach's alpha for each of the parts was calculated. Using the alphas for both parts, number of questions in each part and average correlation between questions in both parts of the original questionnaire, the Spearman-Brown coefficient for the questionnaire as a whole was calculated by the Spearman-Brown "prediction" formula¹⁰.

Factorial analysis

Factorial analysis was used to reveal whether certain phenomenon (in this case quality of life) has only one or more facets (domains). Confirmatory factorial analysis of the Serbian translation of the OHQoL-UK(W) was made by the principal components method¹². First, suitability of the questionnaire and sample for factorial analysis was tested by Kai-

ser-Meyer-Olkin measure of sampling adequacy and by the Bartlett's test of sphericity. Then, the factors were extracted at first without rotation, with conditions that Eigenvalues had to be greater than 1, and using Scree-plot (the extracted factors were above the "elbow" of the graph). Second, referent axes were rotated orthogonally, by the Varimax method, and another extraction of the factors was made, using the same criteria as for the non-rotated solution. Extracted factors were then compared with the factors of the original OHQoL-UK(W) scale, and named accordingly.

Validity

Criterion validity of the Serbian translation of the OHQoL-UK(W) was tested by correlation of its total scores with total scores of the same study participants on VAS and with the DMFT index values. The scores and index values were correlated by the Spearman's method, since they did not follow normal distribution. All calculations were made in the Statistical Program for Social Sciences (SPSS), version 18.

Results

Characteristics of the participants are presented in the Table 1.

Reliability

Results of the OHQoL Serbian translation among participants showed high internal consistency, with Cronbach's

alpha being 0.947. When the OHQoL-UK(W) scale was divided by the split-half method to two parts, with the same number of questions, Cronbach's alphas were 0.950 and 0.868, for the both parts, respectively; the value of the Spearman-Brown coefficient for the OHQoL-UK(W) as a whole calculated from the split-half method by the Spearman-Brown "prediction" formula was 0.918. The mean total score (\pm standard deviation) of the scale was 109.4 ± 25.2 . Translated questions to Serbian, mean values and standard deviations of responses for each question, as well as skewness and kurtosis of distributions, are shown in the Table 2.

Factorial analysis

The Kaiser-Meyer-Olkin test confirmed sampling adequacy with its value of 0.958 and the Bartlett's test of sphericity was highly significant ($\chi^2 = 4,174.508$; $df = 120$; $p = 0.000$). The orthogonal rotation could not be performed, because only one factor was extracted in the first place (with loading of 10.847, which explains 67.8% of variance). Our results confirmed the factor analysis of the original scale, where only one factor was extracted, too ¹.

Validity

The total score of the OHQoL-UK(W) correlated significantly with the VAS score (Spearman's correlation coefficient 0.221, $p = 0.000$), and with the value of DMFT index (Spearman's correlation coefficient -0.372, $p = 0.000$) (see Table 1 for absolute values of VAS score and DMFT index).

Table 1

Characteristics of the study participants (n = 250)

Parameter	Value
Age (years), mean \pm standard deviation	37.3 \pm 17.6
median (max–min)	29.0 (74–18)
Male/female, n (%)	83/167 (33.2/66.8)
Having at least one chronic, non-contagious, systemic disease, n (%)	
yes/no	49/201 (19.6/80.4)
Having allergy of any kind, n (%)	
yes/no	34/216 (13.6/86.4)
Smoking cigarettes, n (%)	
yes/no	70/180 (28.0/72.0)
Drinking alcohol every day, n (%)	
yes/no	8/242 (3.2/96.8)
Had major surgery in the past, n (%)	
yes/no	80/170 (32.0/68.0)
DMFT index, mean \pm standard deviation	13.1 \pm 7.1
median (max–min)	12 (28–1)
VAS score, mean \pm standard deviation	51.9 \pm 35.8
median (max–min)	51 (100–0)

n (%) – number (%) of participants; DMFT – decay-missing-filled teeth; VAS – visual analogue scale.

Table 2

Descriptive statistics for each of the translated items of the OHQoL-UK(W)

Item	Mean	Standard deviation	Skewness	Kurtosis
Eating (Kakav uticaj ima stanje Vaše usne duplje na to kako se hranite i uživate u hrani?)	6.90	1.890	-0.817	0.390
Appearance (Kakav uticaj ima stanje Vaše usne duplje na Vaš izgled?)	6.84	1.890	-0.616	-0.219
Speech (Kakav uticaj ima stanje Vaše usne duplje na Vaš govor?)	7.08	1.791	-0.586	-0.202
General health (Kakav uticaj ima stanje Vaše usne duplje na Vaše opšte zdravstveno stanje?)	6.95	1.792	-0.628	0.160
Sleep (Kakav uticaj ima stanje Vaše usne duplje na Vašu sposobnost da se opustite i spavate?)	6.80	1.882	-0.498	-0.263
Social life (Kakav uticaj ima stanje Vaše usne duplje na Vaš društveni život?)	6.98	1.765	-0.408	-0.598
Romantic relationship (Kakav uticaj ima stanje Vaše usne duplje na Vaše ljubavne veze?)	6.97	1.783	-0.277	-0.910
Smiling (Kakav uticaj ima stanje Vaše usne duplje na Vaš osmeh i smejanje?)	6.98	2.020	-0.786	-0.065
Self-confidence (Kakav uticaj ima stanje Vaše usne duplje na Vaše samopuzdanje?)	6.96	1.884	-0.512	-0.611
Worry (Kakav uticaj ima stanje Vaše usne duplje na Vašu bezbrižnost (nedostatak zabrinutosti)?)	6.63	1.916	-0.344	-0.493
Mood (Kakav uticaj ima stanje Vaše usne duplje na Vaše raspoloženje?)	6.76	1.932	-0.458	-0.434
Work (Kakav uticaj ima stanje Vaše usne duplje na Vaš posao ili sposobnost obavljanja svakodnevnih poslova?)	6.61	1.781	0.017	-0.945
Finance (Kakav uticaj ima stanje Vaše usne duplje na Vaše prihode?)	6.50	1.842	-0.069	-0.564
Personality (Kakav uticaj ima stanje Vaše usne duplje na Vašu ličnost?)	6.70	1.763	-0.238	-0.465
Comfort (Kakav uticaj ima stanje Vaše usne duplje na Vašu udobnost?)	6.59	1.878	-0.406	-0.175
Breath (Kakav uticaj ima stanje Vaše usne duplje na Vaš zadah?)	7.01	4.401	7.280	68.962

OHQoL-UK(W) – Oral health-related quality of life questionnaire.

Discussion

The concept of the OHQoL-UK(W) scale is based on assumption that oral health affects quality of life, and it was indeed shown in studies where large proportion of respondents perceived oral health as important predictor of their quality of life¹³. Positive influence of good oral health on quality of life is especially present in younger, more educated persons who more frequently visit their dentists^{14,15}. This effect was captured in our sample, too, since it consisted of whole spectrum of participants in regard to education and age.

While kurtosis for majority of the OHQoL-UK(W) items was within the acceptable range for normal distribution, responses of the participants were significantly skewed to the left, i.e. majority of the participants tended to score higher on the scale from 1 to 9 (mostly about 7). Responses to the item about influence of breath on quality of life were skewed the most, and they peaked much above the responses to other items. Similar phenomenon was observed in Serbian population of elderly patients with another instrument for measuring health-related quality of life (Geriatric Oral Health Assessment Index)¹⁶, probably reflecting cultural specificities in Serbia, where patients are not that demanding when oral health is in question, i.e. their estimate is over-optimistic. Concerns about oral health and periodontal condition are below average in Serbian patients, as compared to patients from other countries¹⁷, which could explain why their estimate regarding own oral health-related quality of life was unrealistically high.

Although the OHQoL-UK(W) has questions that aim to capture physical, social and psychological aspects of quality of life separately, it actually measures one phenomenon (as confirmed by factor analysis) because these aspects of oral health-related quality of life are interconnected and dependent one on another. Oral cavity is not only essential for feeding, but it is an instrument of interpersonal and social communication, so it is not surprising that all aspects of quality of life are simultaneously affected by the oral health status^{18,19}.

Recent systematic review found 18 different instruments for measuring oral health-related quality of life, and the best psychometric properties were demonstrated for the Early Childhood Oral Health Impact Scale and Child Perceptions Questionnaire 11–14²⁰. Specific instruments showed worse properties than instruments generic for oral health in total. Our translated questionnaire is generic, and it showed high reliability and validity, within the range of other generic instruments. However, its responsiveness (temporal stability) was not measured, and better interpretation of scores (eg. estimating the minimal important difference) remains to be explored in future studies.

Conclusion

Our study showed that Serbian translation of the OHQoL-UK(W) is as reliable as the original instrument in English, since it has very similar degree of internal consistency, and correlates satisfactorily with the VAS score and in-

versely with the DMFT index. Also, there is only one factor which is composed of all items of the Serbian translation of the scale, which corresponds to the factorial structure of the original scale (also only one factor). Therefore, Serbian translation of the OHQoL-UK(W) is reliable instrument for measuring oral health-related quality of life in adult dentistry patients, which could be of great help in clinical practice

when dentists evaluate effects of therapy and prepare future treatment plans.

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R E F E R E N C E S

1. McKenna SP, Wilburn J. Patient value: its nature, measurement, and role in real world evidence studies and outcomes-based reimbursement. *J Med Econ* 2018; 21(5): 474–80.
2. John MT, Reissmann DR, Čelebić A, Baba K, Kende D, Larsson P, et al. Integration of oral health-related quality of life instruments. *J Dent* 2016; 53: 38–43.
3. McGrath C, Bedi R. An evaluation of a new measure of oral health related quality of life-OHQoL-UK(W). *Community Dent Health* 2001; 18(3): 138–43.
4. McGrath C, Bedi R. Measuring the impact of oral health on quality of life in Britain using OHQoL-UK(W). *J Public Health Dent* 2003; 63(2): 73–7.
5. McGrath C, Bedi R. Understanding the value of oral health to people in Britain—importance to life quality. *Community Dent Health* 2002; 19(4): 211–4.
6. Vucic Lj, Glisic B, Kisic-Tepavcic D, Vucic U, Drulovic J, Pekmezovic T. Cross-cultural adaptation and validation of the disease specific questionnaire OQLQ in Serbian patients with malocclusion. *Zdr Varst* 2016; 55(3): 166–73.
7. Stančić I, Kulić J, Tibaček-Šojić L, Stojanović Z. Applicability of a Serbian version of the 'Oral Impacts on Daily Performance (OIDP)' index: Assessment of oral health-related quality of life. *Vojnosanit Pregl* 2012; 69(2): 175–80.
8. Stancić I, Sojić LT, Jelenković A. Adaptation of Oral Health Impact Profile (OHIP-14) index for measuring impact of oral health on quality of life in elderly to Serbian language. *Vojnosanit Pregl* 2009; 66(7): 511–5. (Serbian)
9. Wild D, Grove A, Martin M, Eremenco S, McElroy S, Verjee-Lorenz A, et al. Principles of Good Practice for the Translation and Cultural Adaptation Process for Patient-Reported Outcomes (PRO). Measures: report of the ISPOR Task Force for Translation and Cultural Adaptation. *Value Health* 2005; 8(2): 94–104.
10. Streiner DL, Norman GR. *Health Measurement Scales - a practical guide to their development and use*. 4th ed. Oxford: Oxford University Press; 2008.
11. Ouchi Y, Rakugi H, Arai H, Akishita M, Ito H, Toba K, et al. Redefining the elderly as aged 75 years and older: proposal from the Joint Committee of Japan Gerontological Society and the Japan Geriatrics Society. *Geriatr Gerontol Int* 2017; 17(7): 1045–7.
12. Carleton RN, Thibodeau MA, Teale MJ, Welch PG, Abrams MP, Robinson T, et al. The center for epidemiologic studies depression scale: a review with a theoretical and empirical examination of item content and factor structure. *PLoS One* 2013; 8(3): e58067.
13. Klotz AL, Tauber B, Schubert AL, Hassel AJ, Schröder J, Wahl HW, et al. Oral health-related quality of life as a predictor of subjective well-being among older adults—A decade-long longitudinal cohort study. *Community Dent Oral Epidemiol* 2018; 46(6): 631–8.
14. Unell L, Söderfeldt B, Halling A, Birkebed D. Explanatory models for clinically determined and symptom-reported caries indicators in an adult population. *Acta Odontol Scand* 1999; 57(3): 132–8.
15. Kumar S, Bhargav P, Patel A, Bhati M, Balasubramanyam G, Duraiswamy P, et al. Does dental anxiety influence oral health-related quality of life? Observations from a cross-sectional study among adults in Udaipur district, India. *J Oral Sci* 2009; 51(2): 245–54.
16. Popović Z, Gajić I, Obradović-Djurčić K, Milosević DP. Introduction to verification of the GOHAI instrument for measuring the oral health-related quality of life in patients with dentures using the Serbian preliminary version—A pilot study. *Vojnosanit Pregl* 2015; 72(12): 1055–62.
17. Kovacević V, Milosavljević M, Rancić N, Daković D. Assessment of the periodontal health and community periodontal index in the Army of Serbia. *Vojnosanit Pregl* 2015; 72(11): 953–60.
18. Kent RD. Nonspeech Oral Movements and Oral Motor Disorders: A Narrative Review. *Am J Speech Lang Pathol* 2015; 24(4): 763–89.
19. Buntun K. Speech versus nonspeech: different tasks, different neural organization. *Semin Speech Lang* 2008; 29(4): 267–75.
20. Zaror C, Pardo Y, Espinoza-Espinoza G, Pont A, Muñoz-Millán P, Martínez-Zapata MJ, et al. Assessing oral health-related quality of life in children and adolescents: a systematic review and standardized comparison of available instruments. *Clin Oral Investig* 2019; 23(1): 65–79.

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