ORIGINAL ARTICLES

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

Uvod u verifikaciju instrumenta GOHAI za merenje oralnozdravstvenog kvaliteta života osoba sa zubnim nadoknadama primenom preliminarne srpske verzije – pilot studija

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Abstract

Background/Aim. Quality of life related to health should be seen as a multidimensional concept that, in addition to the physical symptoms associated with a disease and treatment, should include physical, psychological and social functioning of a person. The primary objective of this study was to use the Serbian preliminary version of the Geriatric Oral Health Assessment Index (GOHAI) questionnaire in oder to examine the consistency, reliability and stability, as well as an introduction to the verification tool. **Methods.** The GOHAI questionnaire with 6-level Likert scale, translated into Serbian, including the relevant oral health characteristics (oral hygiene, required dentures, number of teeth extracted), was filled by five specialists in prosthodontics for 30 randomly selected respondents, before and after the dental prosthetic treatment. Subsequently, in order to measure the reliability of the questionnaire, 27 patients were re-interviewed. **Results.** The value of Cronbach's Alpha Coefficient (Crα) before the treatment was 0.878, and after the treatment it was 0.788 confirming the internal consistency and stability of the questionnaire. The validity of discriminatory properties of the GOHAI was confirmed by the Spearman's correlation coefficient (r), which was highly sig-nificantly associated with oral health characteristics, confirming the high reliability of the measurement. The results of test-retest analysis measured by the individual Pearson's correlation coefficient (r) were in the range of 0.34–0.97, and for the total score r was 0.927, while the Kappa coefficient was 0.63. The correlation analysis of the GOHAI score before the treatment showed that for 10 questions there was a statistically significant correlation of the score with the answers to the questions, and for 6 questions Spearman's r was ≥ 0.7. After the treatment a highly signifi-cant correlation of the GOHAI was shown with the answers to 10 questions, while for 5 questions the Spearman's r was > 0.6. The GOHAI average score before the treat-ment was 19.44 ± 11.12, and after the treatment 2.77 ± 3.83, where the lower value indicates better quality of life. **Conclusion.** The results of this pilot study confirm internal consistency and stability of the Serbian preliminary version of the GOHAI questionnaire and the causal relation be-tween the quality of life and the characteristics of oral health of the patients with dentures. Accordingly, instrument veri-fication is recommended.

Key words:
dentures; aged; questionnaires; quality of life; serbia.

Apstrakt

Uvod/Cilj. Kvalitet života u vezi sa zdravljem treba pos-matrati kao multidimenzioni koncept koji, pored fizičkih simptoma vezanih za bolest i lečenje, treba da obuhvati i fi-zičko, psihičko i društveno funkcionisanje osobe. Primarni cilj studije bio je da se korišćenjem preliminarne srpske ver-zije upitnika *Geriatric Oral Health Assessment Index* (GOHAI) ispita konzistentnost, pouzdanost i stabilnost, kao uvod u verifikaciju instrumenta. **Metode.** GOHAI upitnik sa 6-stepenom Likertovom skalom, preveden na srpski jezik, koji je uključivao i oralnozdravstvene karakteristike (oralna higi-jena, potrebne zubne nadoknade, broj izvađenih zuba), po-punjavan je od strane petoro specijalista stomatološke pro-tetike za 30 slučajno izabranih ispitanika, pre i posle stoma-toprotetskog lečenja. Naknadno, radi merenja pouzdanosti upitnika, ponovo je intervjuisano 27 ispitanika. **Rezultati.** Vrednost *Cronbach's Alpha Coefficient* (Crα) pre lečenja bila je 0,878, a posle lečenja 0,788, čime su potvrđene interna kon-zistentnost i stabilnost upitnika. Valjanost diskriminatornog

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svojstva GOHAI potvrđena je vrednostima Spearmanovog koeficijenta korelacije (r), koji je značajan kada su u pitanju oralnozdravstvene karakteristike, čime je potvrđena valjanost merenja. Rezultati test-retest analize merene pojedinačnim Pearsonovim koeficijentom korelacije (r) bili su u rasponu 0,34–0,97, a za ukupan skor r je bio 0,927, dok je Kappa koeficijent bio 0,63. Korelaciona analiza GOHAI pre lečenja ukazala je da je za 10 pitanja postojala značajna povezanost skora sa odgovorima na pitanja, a za 6 Spearmanov r bio je ≥ 0,7. Posle lečenja utvrđena je značajna veza GOHAI sa odgovorima na 10 pitanja, a za 5 Spearmanov r

bio je > 0.6. Prosek GOHAI skora pre lečenja bio je 19,44 ± 11,12, a posle lečenja 2,77 ± 3,83, gde manja vrednost ukazuje na bolji kvalitet života. **Zaključak.** Rezultati ovog pilot istraživanja potvrdili su internu konzistentnost i stabilnost preliminarne srpske verzije GOHAI upitnika, kao i kauzalnu vezu kvaliteta života sa karakteristikama oralnog zdravlja ispitanika sa zubnim nadoknadama, te se može preporučiti sprovođenje verifikacije instrumenta.

Ključne reči:
proteze; stare osobe; upitnici; kvalitet života; srbija.

Introduction

In medical and health researches the concept of quality of life is the concept that spans the areas related to physical, functional, psychological and social health of a patient. The World Health Organisation Quality of life (WHOQOL) group gave the definition that "Quality of life is an individual's perception of his/her position in life, within the culture and value systems in which they live and in relation to the objectives, expectations, standards and concerns. It is a broad concept affected by a person's physical health, his/her mental state, level of independence, social relationships, and relations to the most important events in the environment" [1]. All the later definitions and researches of quality of life related to health, indicate that it should be seen as a multidimensional concept, which, in addition to physical symptoms related to the disease and treatment, should also include physical, psychological and social functioning of a person [2].

Although the objective dimension of health is extremely important in determining the health condition of individuals, subjective assessment and personal expectations transform the objective situation into the perceived quality of life. The reintegration of the patient to normal life is a reorganization of disturbed or lost functions of an individual (physical, psychological and social) into a harmonious whole, that is, a state of adaptation to good life after a disability due to illness or injury. Measuring quality of life in health-related entities should cover each objective and a subjective component (symptom status, social roles), which means that it should involve the measurement of all these functions. Physical and emotional function, considered together, constitute health related quality of life and social function is a very important aspect of the overall quality of life of people [3, 4].

Oral illnesses are progressive and cumulative and affect the quality of life of patients, especially the elderly. The loss of one or more teeth (partial edentulism), or all teeth (total edentulism) due to illness or injury represents a traumatic experience and a degree of disability. With aging, even when a person really cares about his oral health, there is a gradual tooth loss [5].

Longer life expectancy and preservation of teeth due to timely dental treatment, lead to the fact that more patients at the oldest age require dental prosthetic care and tooth loss and their restoration is one of the major dental problems faced by the elderly [6]. According to the data of the Gerontology Center of Public Health in Zagreb on the use of medical aids of persons aged between 65 and 94, dentures (fixed and mobile) were in the second place, just behind the glasses [7]. For these reason it is necessary to pay special attention to measuring oral health-related quality of life in patients with dentures [8].

During examination of the impact of oral health on quality of life, a large number of instruments was built in order to find adequate and reliable questionnaire that can be used in everyday practice. The literature states that among the most appropriate indices for testing the quality of life of the elderly population are the Geriatric Oral Health Assessment Index (GOHAI), the Oral Health Impact Profile-49 (OHIP-49) and its shortened version of the OHIP-14 [9].

The GOHAI [2] has been adapted for general use, translated and tested on the samples of adults in many countries, independently [6, 10–15] or compared to other indices [16, 17].

In our environment, researches in this area are rare and more recent. In the conclusion of a study conducted in order to translate the index OHIP-14 into Serbian language, assessing its validity in practice, it is stated that "The Serbian version of shortened form of OHIP index can be used in dental prosthetic work with patients of older age. The information obtained from the questionnaire can be used as an aid in setting the indication, determining the need for treatment, assessing the state of oral health and the conducted prosthetic treatment. It is also desirable to translate and use another index and check its applicability in practice. In this way it will be possible to make a comparison with the OHIP index and perhaps give way to a specific index for Serbian speaking area, which will suit our mentality and cultural characteristics" [18].

Linguistic and cultural norms, as well as the health care system in Serbia are different from other countries, which imposes the need to confirm the validity of the GOHAI questionnaire in our country and to carry out the verification, before it's recommendation for mass use [14, 18].

Methods

The Ethics Committee of the Faculty of Dental Medicine, University of Belgrade, gave approval no. 36/18 to conduct the survey. The study was conducted on a group of

30 patients, randomly selected from the patients who contacted the Department of Prosthodontics at the Military Medical Center of New Belgrade, in a period of 3 months. Five dentists took part in the pilot study, and their selection was random.

This pilot study was designed as a cross sectional study evaluation using a questionairre before and after the treatment. The instrument of the study was an individual questionnaire with questions relatied to sociodemographics of the respondents (gender, age and education level), and the oral health condition established by oral examination (oral hygiene, the number of extracted teeth and the dentures requirement). In addition, the questionnaire contained questions about oral health-related quality of life of the patients before the treatment and three months afterwards.

A specialist in prosthodontics, while examining the respondents, identified condition of oral health and the treatment requirements of the respondents and their sociodemographic status and entered the data in a predefined questionnaire. At the same time he interviewed the patients about the state of their oral health quality of life and marked one of the options for each question in the questionnaire. During the check-ups, three months after the completion of dental prosthetic treatment, the same dentist asked the same respondents the same questions about the quality of their lives and marked the answers in the questionnaire.

Subsequently, in order to measure the reliability of the questionnaire [19], two months after the check-ups, 27 patients were re-interviewed, and the questions were related to the current rating of the quality of their lives.

For testing oral health-related quality of life of patients the GOHAI was used. The GOHAI was consisted of 12 questions, and the answers to them were graded by a scale of Liket form (0 = never, 1 = almost never, 2 = occasionally, 3 = often, 4 = very often, 5 = always). The values of GOHAI score ranged from 0 to 60, where higher scores indicate more problems [9, 20, 21].

The questions were translated into Serbian language by a professional translator of English, in cooperation with the authors of the study, in accordance with the recommendations from the references [6, 22, 23] and adapted to our patients. In the Serbian version, the questions were: 1) Is there any kind of food you cannot eat or cannot eat the desired amount? 2) Do you have difficulty eating certain food, such as meat or a hard apple? 3) Do you have difficulty swallowing certain food? 4) Does the condition of your teeth and mouth prevent you from speaking as clearly as you wish? 5) Are you, due to a feeling of discomfort, unable to eat all kinds of food? 6) Do you avoid contact with other people because of the condition of your mouth and teeth? 7) Are you unhappy with the condition of your mouth and teeth? 8) Do you use any medications to reduce pain or discomfort caused by the condition of your teeth and mouth? 9) Are you worried about the problems with your mouth and teeth? 10) Do you feel uncomfortable or stressed because of the condition of your mouth and teeth? 11) Are you embarrassed to eat in front of others because of the condition of your mouth and

teeth? 12) Are your teeth sensitive to hot, cold or sweet food?

Based on the collected data, the base of respondents was created in the standard software package SPSS for Windows version 17.0, USA, which was used for statistical analysis. Statistical analysis was primarily related to the establishment of stability and internal consistency of the questionnaire, as well as discriminatory reliability of the questionnaire scale before and after the dental prosthetic treatment. Test-retest statistical analysis of data for 27 subjects was conducted in accordance with recommendations from the reference [19, 24, 25].

In order to determine the influence of conducted dental prosthetic treatment on oral health-related quality of life in patients, we have calculated the average and standard deviation of the GOHAI scores and percentile representation of the value of responses to each question in the questionnaire before and after the treatment. In addition, Student's t-matched-test was used for determining the value of the difference in the responses to individual questions, as well as the GOHAI scores before and after the treatment.

Pearson's χ^2 test and the analysis of variance (ANOVA) were used to assess the relationship of sociodemographic (gender, age, education) and oral health indicators (oral hygiene, the need for dental prosthetic treatment, the number of extracted teeth) with the values of the GOHAI score.

Internal consistency was assessed by Cronbach's Alpha coefficient (Crα) and the discriminatory analysis of responses to individual questions before and after the treatment.

To test the validity of the discriminatory properties of the GOHAI score in relation to oral health (oral hygiene, the need for dentures and the number of extracted teeth) Spearman's Rank Correlation Coefficient (r) was used, and to determine the reliability of the questionnaire during the test-retest analyses Pearson's correlation coefficient and Kappa coefficient were used.

Results

Looking at the distribution of frequency and structure of the respondents' answers to individual questions in the GOHAI questionnaires before the treatment, the prevailing response was occasionally-often, then never-almost never and in the end very often-always. After the treatment, the proportion of respondents who answered to the questions with never-almost-never significantly increased, the number of those who responded with occasionally-often significantly reduced, while the number of respondents who gave answers very often-always was negligible (Table 1).

The correlation analysis of the GOHAI score before the treatment showed that there was a statistically highly significant correlation of values with the answers for 10 questions to the questionnaire ($p < 0.01$), for one question the relationship was statistically significant ($p < 0.05$) and for one question the significance of relationship was not stated, and for 6 questions Spearman's r was ≥ 0.7 (Table 2).

Table 1
Frequency distribution and structure of the responses to individual questions in the Geriatric Oral Health Assessment Index (GOHAI) questionnaire before and after the dental prosthetic intervention

Questions	Never (0)		Almost never (1)		Occasionaly (2)		Often (3)		Very often (4)		Always (5)	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Physical difficulties												
1. Is there any kind of food you cannot eat or cannot eat the desired amount?	5 (16.7)	23 (76.7)	3 (10.0)	5 (16.7)	9 (30.0)		9 (30.0)		1 (3.3)		3 (10.0)	2 (6.7)
2. Do you have difficulty eating ceratin food such as meat or a hard apple?	6 (20.0)	22 (73.3)	4 (13.3)	8 (26.7)	11 (36.7)		3 (10)		6 (20.0)			
3. Do you have difficulty swallowing certain food?	14 (46.7)	25 (83.3)	7 (23.3)	4 (13.3)	3 (10.0)		6 (20.0)	1 (3.3)				
4. Does the condition of your teeth and mouth prevent you from speaking as clearly as you wish?	9 (30.0)	25 (83.3)	8 (26.7)	5 (16.7)	9 (30.0)		1 (3.3)		3 (10.0)			
Pain/Discomfort												
5. Are you, due to the feeling of discomfort unable to eat all kinds of food?	9 (30.0)	27 (90.0)	5 (16.7)	3 (10.0)	9 (30.0)		7 (23.3)					
8. Do you use any medicatio9ns to reduce pain or discomfort, caused by the condition of your teeth and mouth?	12 (40.0)	24 (80.0)	6 (20.0)	5 (16.7)	8 (26.7)	1 (3.3)	2 (6.7)		2 (6.7)			
12. Are your teeth sensitive to cold, hot, or sweet food?	10 (33.3)	21 (70.0)	3 (10.0)	7 (23.3)	11 (36.7)	2 (6.7)		4 (13.3)				
Physical problems												
6. Do you avoid contact with other people because of the condition of your teeth and mouth?	17 (56.7)	26 (86.7)	6 (20.0)	4 (13.3)	5 (16.7)		1 (3.3)		1 (3.3)			
7. Are you unhappy with the condition of your mouth and teeth?	4 (13.3)	23 (76.7)	3 (10.0)	5 (16.7)	8 (26.7)	2 (6.7)	7 (23.3)		5 (16.7)		3 (10.0)	
9. Are you unhappy because of the problems with your mouth, teeth?	7 (23.3)	25 (83.3)	3 (10.0)	3 (10.0)	10 (33.3)	2 (6.7)	2 (6.7)		4 (13.3)		4 (13.3)	
10. Do you feel uncomfortable or stressed because of the condition of your mouth and teeth?	9 (30.0)	28 (93.3)	6 (20.0)	2 (6.7)	7 (23.3)		2 (6.7)		3 (10.9)		3 (10.0)	
11. Are you embarrased to eat in front of others because of the Condition of your mouth and teeth?	14 (46.7)	26 (86.7)	6 (20.0)	4 (13.3)	3 (10.0)		2 (6.7)		1 (3.3)		4 (13.3)	

Data in the table are presented as number (n) and percentage (%) of the patients.

<div align="right">Table 2</div>

Correlation analysis in the Geriatric Oral Health Assessment Index (GOHAI) score before and after the treatment

Questions	Spearman's correlation coefficients (n = 30)	
	before the tretmant	after the tretmant
Is there any kind of food you cannot eat or cannot eat the desired amount?	0.300	0.642**
Do you have difficulty eating certain food, such as meat or a hard apple?	0.405*	0.627**
Do you have difficulty swallowing certain food?	0.588**	0.424*
Does the condition of your teeth and mouth prevent you from speaking as clearly, as you wish?	0.562**	0.627**
Are you, due to the feeling of discomfort, unable to eat all kinds of food?	0.700**	0.353
Do you avoid contact with other people because of the condition of your mouth and teeth?	0.751**	0.340*
Are you unhappy with the condition of your mouth and teeth?	0.633**	0.736**
Do you use any medications to reduce pain or discomfort caused by the condition of your teeth and mouth?	0.763**	0.389*
Are you worried about the problems with your mouth and teeth?	0.771**	0.470**
Do you feel uncomfortable or stressed because of the condition of your mouth and teeth?	0.800**	0.384*
Are you embarrassed to eat in front of others because of the condition of your mouth and teeth?	0.840**	0.517**
Are your teeth sensitive to hot, cold or sweet food?	0.487**	0.735**

*$p < 0.05$; **$p < 0.01$.

When the same analysis was conducted after the treatment, it indicated the presence of highly significant relationship of the score with the answers to seven questions ($p < 0.01$), the significant relationship with the answers to 4 questions ($p < 0.05$), and for one question the significance of relationship was not stated, and for 5 questions Spearman's r was > 0.6 (Table 2). Consequently, the values of responses to individual questions in the GOHAI questionnairy decreased (Figure 1), and the values of Student's t-test of matched pairs differences was highly significant (Table 3).

Specialists in dental prosthetics, during the check-ups, found that in 12 (40.0%) patients oral hygiene was satisfac-tory, while in the remaining 18 (60.0%) that was not the case. It was also found that 12 (40.0%) of respondents needed fixed dentures, 9 (30%) needed mobile dentures, while 9 (30%) of the respondents needed both types of work. In the group of patients there were 3 (10.0%) edentu-lous, 16 (53.3%) respondents had 10 teeth extracted, while 11 (36.7%) patients had 11 to 25 teeth extracted (Table 4).

The values of Sperman`s correlation coefficient of the GOHAI score before the treatment and the parameters of oral health indicated that GOHAI score was associated ($p = 0.01$) with oral hygiene ($r = 0.468$) and with the number of extracted teeth ($r = 0.496$), and that it was also associated ($p = 0.05$)

<div align="right">Table 3</div>

Student's matched questions and answers test in the Geriatric Oral Health Assessment Index (GOHAI) score before and after the prosthetic intervention

| Questions	Difference between the GOHAI score before and after the treatment		
	x̄ ± SD	t	p
Is there any kind of food you cannot eat or cannot eat the desired amount?	1.733 ± 1.999	4.750	0.000
Do you have difficulty eating certain food, such as meat or hard apple?	1.700 ± 1.343	6.934	0.000
Do you have difficulty swallowing certain food?	0.800 ± 1.375	3.188	0.003
Does the condition of your teeth and mouth prevent you from speaking as clearly, as you wish?	1.200 ± 1.324	4.966	0.000
Are you, due to the feeling of discomfort, unable to eat all kinds of food?	1.367 ± .217	6.150	0.000
Do you avoid contact with other people because of the condition of your mouth and teeth?	0.633 ± 1.129	3.072	0.005
Are you unhappy with the condition of your mouth and teeth?	2.200 ± 1.627	7.405	0.000
Do you use any medications to reduce pain or dis-comfort caused by the condition of your teeth and mouth?	0.967 ± 1.217	4.350	0.000
Are you worried about the problems with your mouth and teeth?	1.933 ± 1.701	6.227	0.000
Do you feel uncomfortable or stressed because of the condition of your mouth and teeth?	1.700 ± 1.664	5.596	0.000
Are you embarrassed to eat in front of others because of the condition of your mouth and teeth?	1.267 ± 1.837	3.777	0.001
Are your teeth sensitive to hot, cold or sweet food?	1.200 ± 1.584	4.148	0.000
GOHAI score	16.700 ± 12.490	7.318	0.000
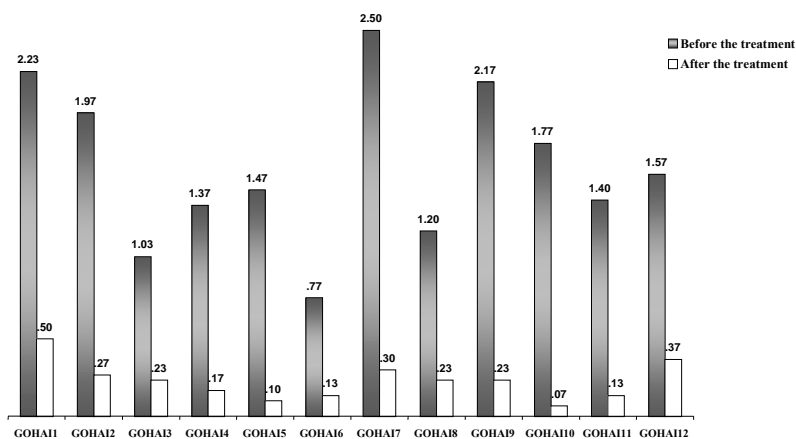
Fig. 1 – The values of the Geriatric Oral Health Assessement Index (GOHAI) score and responses to individual questions before and after the treatment (test-retest analysis).

Table 4

Correlation of the Geriatric Oral Health Assessment Index (GOHAI) score before the treatment with quality of oral hygiene required dentures, and extracted teeth

Variables	Patient n (%)	Spearman's rank correlation coefficient (r)
Oral hygiene		
satisfactory	12 (40)	0.468**
unsatisfactory	18 (60)	
Required dentures		
fixed	12 (40)	
mobile	9 (30)	0.392*
both types of dentures	9 (30)	
Extracted teeth		
edentulous	3 (10.0)	
up to 10	16 (53.3)	0.496**
11–25	11 (36.7)	

*$p < 0.05$; **$p < 0.01$.

with the type of required dentures ($r = 0.392$), confirming the validity of discriminatory properties of the GOHAI score in relation to oral health of the respondents (Table 4).

The sample included 30 respondents of various education, 13 (43.3%) men and 17 (56.7%) women, median age 67.87 ± 11.29. Without primary education was 1 (3.3%), with primary education 4 (13.3%), with secondary education or college 13 (43.3%), with university education 12 (40.0%) respondents. Observing the dependence of the GOHAI scores on sociodemographic characteristics of respondents, it appears that it was not statistically significant. The values of the applied tests were: in relation to gender, $\chi^2 = 25.249$, $p = 0.123$; in relation to age, F = 1.354, $p = 0.329$, and in relation to education level, $\chi^2 = 74.583$, $p = 0.9097$.

The value of the GOHAI score before the treatment was 19.44 ± 11.12, the range 4.00–44.00, while it decreased to 2.77 ± 3.83 in the interval 0.00–14.00 after the prosthodontic treatment.

When it comes to values of the GOHAI score before and after the treatment, Student's t-test of matched pairs showed that the average differences value was 16.700 ± 12.49 with a high significance at $t = 5.596$, $p = 0.000$ (Table 3).

Coefficient values before the treatment ($Cr\alpha = 0.878$) and after the treatment ($Cr\alpha = 0.788$) indicate that the applied GOHAI questionnaire is internally consistent and stable, according to quality criteria which were proposed for measuring the characteristics of health condition.

Discriminatory analysis, which grouped the values of respondents' answers to questions in GOHAI questionnaire, provided the result of classification before and after the treatment of 90%, thus confirming the reliability and value of usability of the applied scale.

Analysis of the reliability and validity of the GOHAI questionnaire (test-retest) was carried out by re-interviewing 27 subjects included in the sample two months after the control examination (test-retest reliability), and the correlation coefficients of individual samples were in the range of 0.64 to 0.97, while for the entire group was $r = 0.927$, and Kappa coefficient = 0.63.

Discussion

During the research of the basic version of the GOHAI questionnaire, the consistency and stability of the questionnaire was at $Cr\alpha = 0.79$ in a sample of 87 patients [20]. In the se-

ries of studies which were later pursued throughout the world, with translation and cultural adaptation of the GOHAI questionairre to different languages [14], the consistency and stability of the questionnaire was at similar levels in India (Crα = 0.88) in a sample of 500 respondents [26], France (Crα = 0.86) in a sample of 260 respondents [14], Germany (Crα = 0.92) [12], Sweden (Crα = 0.86) in a sample of 153 respondents [27], Lebanon (Crα = 0.887) [28], Malaysia (Crα = 0.79) [29] Latin America (Crα = 0.83) in a sample of 280 respondents [30] and in Arab countries (Crα = 0.83) [31] and Japan (Crα = 0.83) [21].

Our pilot research, regardless the fact that the sample size was small, established the value of Crα coefficient = 0.878 before the treatment and Crα = 0.788 after the treatment, indicating that the applied GOHAI questionnaire is internally consistent and stable and completely in accordance with the quality criteria that have been proposed for measuring the characteristics of psychometric questionnaires and surveys related to the health condition of respondents [15, 25].

When considering the question of reliability of the GOHAI questionnaire, and test-retest analysis, Pearson's correlation coefficient in the study of Hassel et al. [12] was in the range 0.36–0.98, for individual subjects, and for the whole group r = 0.89. In the test-retest analysis of Tubert-Jeannin et al. [32], which involved 32 subjects, individual correlation coefficients ranged from 0.51 to 0.87, while for the whole group r = 0.87. The same analysis of Mathur et. al. [8] was conducted on 29 subjects and individual correlation coefficients ranged from 0.748 to 0.946. Hägglin et al. [27] conducted a test-retest analysis in 47 patients and the correlation coefficient of GOHAI for the whole group was r = 0.64. The size of our group of patients in which the test-retest analysis was conducted, and the analysis of the results are in accordance with the mentioned researches.

Results of Tubert-Jeannin et al. [32], when it comes to the application of the GOHAI questionnaire, indicated that the internal correlation coefficients range was in the interval 0.40–0.78, while the values of the same parameters in the study Deshmukh and Radke [26] were in the range 0.50–0.83. In the research of Daradkeh and Khader [31] the internal correlation coefficients were in the range 0.53–0.77, for all questions except for the question 5, for which the correlation coefficient was 0.27, while in the researches of El Osta et. al. [29], the coefficients of internal correlation varied from 0.41 (question no. 12) – 0.79 (question no.10). Hassel et. al. [12] pointed out the internal correlation coefficients range 0.27–0.80. The coefficients of internal correlations of almost all other researches were in this framework, and it is necessary to note that all the researches were conducted only once [33–36].

Internal correlation coefficient values before the treatment in our study were in the range 0.40–0.84, with higher levels of statistical significance, except for the question number 1, for which the internal correlation was 0.30, and the significance of the relation was not stated, and the connection for 10 questions was highly significant. The emphasis must be placed on the fact that the correlation coefficients for the six questions were greater than 0.6. When the same analysis was conducted after the treatment, the internal correlation coefficients were in the range 0.35–0.74, pointing to the existence of a highly significant relationship recently with answers to seven questions, the existence of a significant relationship in terms of three questions, and for one question the significance of relationship was not stated (question 5). Therefore, values of internal correlation coefficients of our pilot study indicate the internal consistency of the questionnaire and show that they are completely in accordance with similar studies in this area.

Conclusion

Based on the obtained results we can conclude that the Serbian preliminary version of the Geriatric Oral Health Assessment Index questionnaire used in the pilot project confirmed the consistency, stability, and validity of the questionnaire. Inroduction to verification the pilot study confirmed the appropriateness of including the parameters and assessment of the quality of life of patients with dentures, before and after the intervention, as a measure of the success of the performed prosthodontic treatment.

There is a need for verification of the GOHAI instrument before recommendation for its mass use.

R E F E R E N C E S

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