The Serbian version of the "Oral Health Questionnaire for Adults"

Srpska verzija „Upitnika za procenu oralnog zdravlja odraslih"

Margareta Lekić*†, Dragana Daković*†, Zoran Lazić†‡, Tatjana Čutović†§,
Irena Ilić‖, Milena Ilić¶

Military Medical Academy, Dental Clinic, *Department of Periodontology, ‡Department
of Implantology, Department of Orthodontics, Belgrade, Serbia; †University of Defence,
Faculty of Medicine of the Military Medical Academy, Serbia; ‖University of Belgrade,
Faculty of Medicine, Belgrade, Serbia; ¶University of Kragujevac, Faculty of Medical
Sciences, Department of Epidemiology, Kragujevac, Serbia

Abstract

Background/Aim. The assessment of the impact of oral health on the quality of life presents the increasing need in testing oral health of an individual and of the entire population. The aim of the study was to translate the index of "Oral Health Questionnaire for Adults" of the World Health Organization into the Serbian language and to check its reliability in the Serbian Armed Forces professional staff. **Methods.** This study was designed as an observational, epidemiological study. The "Oral Health Questionnaire for Adults" was translated into the Serbian language. The classical test theory was used in the data analysis. The assessed characteristics included internal consistency and construct validity. **Results.** A total of 1,741 participants were included in this analysis. The mean age of the study group was 32.4 ± 9.7 years. In the last 12 months, problems which occurred frequently or very often regarding teeth and mouth were as follows: difficult biting of food (6.2%), difficult chewing (5.1%), difficult speech or difficult pronunciation of certain words (1.9%), dryness of the mouth (2.9%), the feeling of discomfort due to the esthetic appearance of teeth (6.8%). The reliability of the "Oral Health Questionnaire for Adults" (items considering Oral Health Self-Assessment) had high internal consistency (the Cronbach's coefficient was 0.879). The Principal component analysis and Promax rotation revealed 1 factor with Eigenvalue exceeding 1, accounting for 54.3% of the total variance. **Conclusion.** The Serbian version of the „Oral Health Questionnaire for Adults" provides very useful and reliable information on the condition of oral health of the Serbian Armed Forces professional members.

Key words:
attitude to health; habits; military personnel; oral health; serbia; surveys and questionnaires; translating.

Apstrakt

Uvod/Cilj. Procena uticaja stanja oralnog zdravlja na kvalitet života predstavlja sve veću potrebu u ispitivanju oralnog stanja pojedinaca, ali i cele populacije. Cilj rada bio je da se indeks „Upitnik za oralno zdravlje odraslih" Svetske Zdravstvene Organizacije prevede na srpski jezik uz proveru njegove pouzdanosti na uzorku pripadnika oružanih snaga Srbije. **Metode.** U radu je primenjena opservaciona, epidemiološka studija. „Upitnik za procenu oralnog zdravlja odraslih" (*Oral Health Questionnaire for Adults*) preveden je na srpski jezik. Pri analizi podataka korišćena je klasična test teorija. Procenjivane karakteristike uključile su unutrašnju konzistentnost i valjanost konstrukcije. **Rezultati.** U ovu analizu je bio uključen ukupno 1 741 ispitanik. Prosečna starost ispitivane grupe iznosila je 32,4 ± 9,7 godina. U poslednjih 12 meseci od problema koji su se javljali često ili veoma često u vezi sa zubima i usnom dupljom bili su: otežano odgrizanje hrane (6,2%), otežano žvakanje (5,1%), otežan govor ili otežano izgovaranje pojedinih reči (1,9%), suvoća usta (2,9%) i osećaj neprijatnosti usled estetskog izgleda zuba (6,8%). Pouzdanost „Upitnika za procenu oralnog zdravlja odraslih" (stavke koje uzimaju u obzir samoocenjivanje oralnog zdravlja) imala je visoku unutrašnju konzistentnost (Kronbahov koeficijent bio je 0,879). Analiza glavnih komponenti i rotacija Promaks otkrili su 1 faktor sa *Eigenvalue* većim od 1, što čini 54,3% ukupne varijanse. **Zaključak.** Srpska verzija „Upitnik za procenu oralnog zdravlja odraslih" pruža veoma korisne i pouzdane informacije o stanju oralnog zdravlja pripadnika oružanih snaga Srbije.

Ključne reči:
stav prema zdravlju; navike; vojni kolektiv; usta, zdravlje; srbija; ankete i upitnici; prevođenje.

Correspondence to: Margareta Lekić, Military Medical Academy, Dental Clinic, Department of Periodontology, Crnotravska 17, 11 000 Belgrade, Serbia. E-mail: lekicmargareta@gmail.com

Introduction

Oral diseases impact around half of the world population and their impact is considered as a very important public health problem in the sense of disease burden and medical expenses [1]. Although oral diseases can be prevented and treated, they still present a problem at the global level [2]. It has been determined that the oral health of individuals in developing countries is getting worse [3]. The problems of public health connected to oral diseases present a serious burden for countries around the world.

World Health Organization (WHO) has a long tradition of epidemiological research in following and monitoring oral health [4]. Studying oral health status, one of the most significant parameters is the number of teeth. A clinical examination is a gold standard for this testing [5]. However, clinical examination has limitations connected to high expenses of personnel, time and resources necessary for this type of research [6]. One of the alternatives to professional clinical testing is questionnaires, which enable the obtaining of basic, but relevant epidemiological information with significantly fewer expenses [7]. In dentistry, self-evaluation is a valid instrument for studying conditions such as oral hygiene, the health of periodontium and the use of dental braces [8]. The studies conducted in several countries point to the fact that self-assessment of the number of teeth was an accurate parameter of high validity [9].

The WHO has a long tradition of epidemiological research, which includes a description of diagnostic criteria that can be easily understood and applied in the programs of public health around the world. The WHO Global Oral Health Data Bank recommends the use of simplified structured questionnaires for the collection of data on self-assessment of oral health and risk factors in adults ("Oral Health Questionnaire for Adults") [4]. The questionnaire has been tested in numerous countries around the world [10, 11]. The language barrier can be the reason to prevent the intensive use of this instrument in countries where English is not a native language. Hence, the purpose of our research was to translate the questionnaire "Oral Health Questionnaire for Adults" of the WHO into the Serbian language and prepare it for the testing of oral health of the Serbian Armed Forces professional members.

Methods

The study was conducted between 2017 and 2019 at the territory of the Republic of Serbia. The study was designed as an observational, epidemiological study, and included 1,741 professional members of the Serbian Armed Forces aged 18–64 years. Based on the data from the literature, a prevalence of 80% was the starting point for sample size calculation in our study [12]. It was necessary to include at least 1,537 participants for a reliable assessment of the oral health of the Serbian Armed Forces professional members, with the strength of the study of 0.8 (80%), mistake type alpha of 0.05%, and foreseen mistake of 2% (0.02).

The approval for the study was obtained by the Ethical Committee of the Military Medical Academy (No. 1/15 - 17). Participation in the research was voluntary, and all participants had signed the informed consent for the participation in the research before they were interviewed.

A total of 1,741 participants were included in this analysis; participation rate was 100%, i.e. all of 1,741 respondents who had accepted participation in the study returned fully completed questionnaires. The criteria for entering the study were that the subject was over 18 years old and younger than 64 and that he/she was a professional member of the Serbian Armed Forces. The exclusion criterion for the study was the professional status of a civilian employee in the Serbian Armed Forces, presence of systemic diseases and acute symptoms of dental diseases.

The study used the WHO questionnaire "Oral Health Questionnaire for Adults", published as a part of the "Oral Health Surveys Basic Methods, 5th edition" by the WHO in 2013 [4]. This questionnaire was specifically designed for self-filling of information on the individual oral health. Except for demographic information, other questions refer to risk factors that impact oral health, individual's habits in maintaining oral hygiene and the use of dentistry services. Also, the information on the frequency of sugar intake, alcohol, and tobacco consumption was collected as well. The original questionnaire includes 16 questions. The variables included in the adult questionnaire were as shown in Table 1. We used all the questions that were stated in the WHO questionnaire in the Serbian version of the questionnaire. However, our version contained only last 14 questions because the questions 1 and 2 (ordinal number of participants and age) already existed in the basic questionnaire for social demographic data.

The WHO questionnaire "Oral Health Questionnaire for Adults" has been translated from the original English language into the Serbian language by the two dentists with good knowledge of the English language using internationally accepted recommendations [13]. Then this version was again translated into the English language. Such translation (backward) was additionally assessed by a dentist proficient in the English language. It was determined that there was no difference between the original version of the questionnaire regarding our version. After that, the questionnaire was again translated into the Serbian language and tested in the pilot study. The pilot study was conducted on 20 participants to confirm that the meaning of every single question is well understood and that they do not cause discomfort and displeasure. The participants were asked the questions orally. Upon the successful conduct of the pilot study, the main study was conducted, which included 1,741 participants. Canvassing was conducted by the two trained interviewers who were mutually harmonized. The work standardization in the field was achieved with suitable training of interviewers on the collection of data, data control and data processing [14].

Table 1

The Serbian version of the "Oral Health Questionnaire for Adults"

1. How many natural teeth do you have?/ *Koliko imate svojih zuba?*

No natural teeth / *Nemate svoje zube*	✈	0
1–9 teeth/ *1–9 zuba*	✈	1
10–19 teeth / *10–19 zuba*	✈	2
20 teeth or more/ *20 svojih zuba ili više*	✈	3

2. During the past 12 months, did your teeth or mouth cause any pain or discomfort?/ *Tokom poslednjih 12 meseci, da li su Vaši zubi i usta izazivali bilo kakve bolove ili nelagodnosti?*

Yes/ *Da*	✈	1
No/ *Ne*	✈	2
Don't know/ *Ne znam*	✈	9
No answer/ *Nema odgovora*	✈	0

3. Do you have any removable dentures?/ *Da li imate bilo kakve mobilne proteze?*

	Yes/*Da* 1	No/*Ne* 2
A partial denture?/ *Parcijalna proteza*	✈	✈
A full upper denture?/ *Totalna gornja proteza*	✈	✈
A full lower denture?/ *Totalna donja proteza*	✈	✈

4. How would you describe the state of your teeth and gums? *Kako biste opisali stanje Vaših zuba i desni?*

	Teeth/ *Zubi*	Gums/*Desni*
Excellent/ *Odlično*	✈ 1	✈ 1
Very good/ *Veoma dobro*	✈ 2	✈ 2
Good/ *Dobro*	✈ 3	✈ 3
Average/*Prosečno*	✈ 4	✈ 4
Poor/ *Loše*	✈ 5	✈ 5
Very poor/ *Veoma loše*	✈ 6	✈ 6
Don't know/ *Ne znam*	✈ 9	✈ 9

5. How often do you clean your teeth?/ *Koliko često perete svoje zube?*

Never/ *Nikad*	✈	1
Once a month/ *Jednom mesečno*	✈	2
2–3 times a month/ *2–3 puta mesečno*	✈	3
Once a week/ *Jednom nedeljno*	✈	4
2–6 times a week/ *2–6 puta nedeljno*	✈	5
Once a day/ *Jednom dnevno*	✈	6
Twice or more a day/ *Dva ili više puta dnevno*	✈	7

6. Do you use any of the following to clean your teeth?/ *Da li koristite nešto od ponuđenog da bi očistili zube?*

	Yes/ *Da* 1	No/ *Ne* 2
Toothbrush/ *Četkica za zube*	✈	✈
Wooden toothpicks / *Drvene čačkalice*	✈	✈
Plastic toothpicks/ *Plastične čačkalice*	✈	✈
Thread (dental floss) / *Konac za zube*	✈	✈
Interdental toothbrush / *Interdentalna četkica*	✈	✈
Charcoal / *Ugalj*		
Chewstick / miswak / *Štapić za žvakanje / štapić za čišćenje zuba*	✈	✈
Mouthwash / *Rastvor za ispiranje usta*	✈	✈
Other/ *Drugo*	✈	✈
Please specify/ *Molimo navedite šta*		

	Yes/ *Da* 1	No/ *Ne* 2
7. a) Do you use toothpaste to clean your teeth?/ *Da li koristite pastu za zube kada perete iste?*	✈	✈
b) Do you use toothpaste that contains fluoride?/*Da li koristite pastu koja sadrži fluor?*	✈	✈

8. How long has it been since you last saw a dentist? / *Koliko je prošlo od vaše poslednje posete stomatologu?*

Less than 6 months/ *Manje od 6 meseci*	✈	1
6–12 months/ *6–12 meseci*	✈	2
More than 1 year but less than 2 years/ *Više od 1 godine, a manje od 2 godine*	✈	3
2 years or more but less than 5 years/ *2 godine ili više, ali manje od 5 godina*	✈	4
5 years or more/ *5 godina ili više*	✈	5
Never received dental care/ *Nikada nisam bio u poseti stomatologu*	✈	6

9. What was the reason of your last visit to the dentist?/ *Koji je bio razlog vaše poslednje posete stomatologu?*

Consultation/advice/ *Konsultacije/savet*	✈	1
Pain or trouble with teeth, gums or mouth/ *Bol ili problem sa zubima, desnima ili ustima*	✈	2
Treatment/ follow-up treatment/ *Tretman/ naknadni tretman*	✈	3
Routine check-up/treatment/ *Rutinski pregled/ tretman*	✈	4
Don't know/don't remember/*Ne znam/ne sećam se*	✈	5

10. Because of the state of your teeth or mouth, how often did you experience any of the following problems during the past 12 months?/ *U poslednjih 12 meseci da li ste primetili neki od navedenih problema?*

	Very ofen / *Veoma često* 4	Fairly often / *Pošteno često* 3	Sometimes / *Ponekad* 2	No / *Ne* 1	Don't know / *Ne znam* 0
a) Difficulty biting food/ *Otežano odgrizanje hrane*	✈	✈	✈	✈	✈
b) Difficulty chewing food/ *Otežano žvakanje*	✈	✈	✈	✈	✈

c) Difficulty with speech pronouncing certain words / *Otežan govor/otežano izgovaranje pojedinih reči*	✈	✈	✈	✈	✈
d) Dry mouth / *Suva usta*	✈	✈	✈	✈	✈
e) Felt embarrassed due to the esthetic appearance of teeth / *Osećaj neprijatnosti usled estetskog izgleda zuba*	✈	✈	✈	✈	✈
f) Felt tense because of problems with teeth or mouth / *Osećaj nelagodnosti usled problema u usnoj duplji*	✈	✈	✈	✈	✈
g) Avoided smiling because of the esthetic appearance of the teeth / *Izbegavanje osmehivanja usled estetskog izgleda zuba*	✈	✈	✈	✈	✈
h) Had sleep that is often interrupted due to severe pain / *Da li ste se budili tokom noći usled bola*	✈	✈	✈	✈	✈
i) Took days off work / *Da li ste uzimali slobodne dane sa posla*	✈	✈	✈	✈	✈
j) Difficulty doing usual activities/ *Otežano izvođenje svakodnevnih aktivnosti*	✈	✈	✈	✈	✈
k) Felt less tolerant of a spouse or people who are close to you/ *Osećali se manje tolerantno prema supružniku i bližoj okolini*	✈	✈	✈	✈	✈
l) Reduced participation in social activities/ *Da li ste smanjili društvene aktivnosti*	✈	✈	✈	✈	✈

11. How often do you eat or drink any of the following foods, even in small quantities? (Read each item)/ *Koliko često konzumirate navedenu hranu i piće (makar i u manjim količinama)?*

	Several times a day/ *Nekoliko puta dnevno* 6	Every day / *Svaki dan* 5	Several times a week / *Nekoliko puta nedeljno* 4	Once a week / *Jednom nedeljno* 3	Several times a month / *Nekoliko puta mesečno* 2	Seldom/ never / *Retko/ nikad* 0
Fresh fruit/ *Sveže voće*	✈	✈	✈	✈	✈	✈
Biscuits, cakes, cream cakes/ *Keks, kolači, kremasti kolači*	✈	✈	✈	✈	✈	✈
Sweet pies, buns/ *Slatke pite, lepinje*	✈	✈	✈	✈	✈	✈
Jam or honey/ *Džem ili med*	✈	✈	✈	✈	✈	✈
Chewing gums containing sugar/ *Žvakaće gume sa šećerom*	✈	✈	✈	✈	✈	✈
Sweets/candies/chocolate / *Slatkiši /čokolada*	✈	✈	✈	✈	✈	✈
Lemonade, Coca Cola or other soft drinks/ *Limunada, Koka-Kola, i druga bezalkoholna pića*	✈	✈	✈	✈	✈	✈
Tea with sugar / *Čaj sa šećerom*	✈	✈	✈	✈	✈	✈
Coffee with sugar/ *Kafa sa šećerom*	✈	✈	✈	✈	✈	✈
Characteristic drink for our country / *Karakteristično piće za našu državu*	✈	✈	✈	✈	✈	✈

12. How often do you use any of the following types of tobacco? (Read each item)/ *Koliko često konzumirate duvanske proizvode?*

	Every day/ Svaki dan 6	Several times a week/Nekoliko puta nedeljno 5	Once a week/ Jednom nedeljno 4	Several times a month/Nekoliko puta mesečno 3	Seldom/ Retko 2	Never/ Nikad 1
Cigarettes / *Cigarete*	✈	✈	✈	✈	✈	✈
Cigars/ *Tompusi*	✈	✈	✈	✈	✈	✈
A pipe/ *Lula*	✈	✈	✈	✈	✈	✈
Chewing tobacco/ *Duvan za žvakanje*	✈	✈	✈	✈	✈	✈
Use snuff/ *Burmut*	✈	✈	✈	✈	✈	✈
Other/*Drugo*	✈	✈	✈	✈	✈	✈

13. During the past 30 days, on the days you drank alcohol, how many drinks did you usually drink per day? / *U poslednjih 30 dana, u danima kada ste konzumirali alkohol, koliko pića ste obično pili u toku dana?*

Less than 1 drink/ *Manje od 1 pića*	✈	0
1 drink/ *1 piće*	✈	1
2 drinks/ *2 pića*	✈	2
3 drinks/ *3 pića*	✈	3
4 drinks/ *4 pića*	✈	4
5 or more drinks/ *5 ili više pića*	✈	5
Did not drink alcohol during the past 30 days/ *Nisam pio/pila alkohol u poslednjih 30 dana*	✈	9

14. What level of education have you completed?/ *Nivo obrazovanja?**

No formal schooling / *Nemam formalno obrazovanje*	✈	1
Less than Primary school / *Osnovna škola*	✈	2
Primary school completed/ *Srednja škola*	✈	3
Secondary school completed / *Fakultet*	✈	4
High school completed/ *Master studije*	✈	5
College/university completed / *Specijalističke studije*	✈	6
Postgraduated degree/ *Doktorske studije*	✈	7
(Insert country-specifi c categories)		

*Level of education in the Serbian version of the "Oral Health Questionnaire for Adults" was adopted according to the education system of the Republic of Serbia.

Statistical analysis

In the descriptive statistics, categorical variables (presented as percentages) and continuous variables (presented as mean ± standard deviation) were calculated. Additionally, we performed analysis to evaluate the reliability and validity of items considering Oral Health Self-Assessment (i.e. question 10 – experience of reduced quality of life due to oral problems).

The classical test theory was used in data analysis. The reliability of the "Oral Health Questionnaire for Adults" was determined by internal consistency coefficient, i.e. Cronbach's coefficient alpha. Cronbach's coefficients > 0.70 were considered acceptable, while values ≥ 0.80 were preferable.

The validity of the "Oral Health Questionnaire for Adults" was evaluated by Principal components analysis. The Promax rotation was used for this analysis, with Kaiser Normalization (delta = 0). The importance of different factors was assessed according to the Kaiser criterion (all factors with eigenvalues greater than 1.0). Value for the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.888, while the value for Bartlett's test of sphericity was highly significant ($p < 0.001$). Statistical analyses were performed using the SPSS 20.0 (IBM SPSS Statistics, Chicago, IL, USA).

Results

The total number of 1,741 participants took part in the survey (Table 2). The average age of the study group was 32.4 ± 9.7 (18–59) years. Out of the total number of participants, 184 participants, i.e. 10.6% were women.

Table 2

Baseline characteristics of the study participants (n = 1,741)

Characteristics	Number (%)
Sex	
male	1,557 (89.4)
female	184 (10.6)
Age groups (years)	
≤ 20	212 (12.2)
21–30	584 (33.5)
31–40	545 (31.3)
41–50	339 (19.5)
≥ 51	61 (3.5)
Marital status	
without a partner	841 (48.3)
with a partner	900 (51.7)

The Serbian version of the "Oral Health Questionnaire for Adults" contained 14 questions (Table 1). The condition of the teeth as good, very good and excellent was described by 57.9% of the participants, while 16% described their condition as bad and very bad. The condition of the gums as good, very good and excellent was described by 60.1% of the participants, while 14.8% described their condition as bad and very bad. The largest number of the participants stated that they brushed their teeth twice or more a day (60.5%), and one third once a day (32.9%). Almost all participants (99.25%) stated they used a toothbrush. The

participants used the following as an aid for maintaining oral hygiene: toothpicks (38.48%), dental floss (27.86%), interdental toothbrush (7.98%) and mouthwash (31.36%). Almost all participants used the toothpaste for brushing their teeth (98.1%), and a toothpaste containing fluoride 82.4%. More than half of the study group (55.3%) visited the dentist less than 6 months ago. 8.3% of the participants did not visit a dentist for more than 2 years. Only one participant never visited the dentist.

As a reason to visit the dentist, 35.4% of the participants stated pain and other oral problems, while 16.3% visited the dentist for consultation and advice. In the last 12 months, out of the mentioned problems, participants cited difficulty in food biting (6.2%), difficulty in chewing (5.1%), difficult speech or difficult pronunciation of certain words (1.9%), mouth dryness (2.9%), feeling of displeasure due to the esthetic appearance of teeth (6.8%), feeling of discomfort due to problems in the oral cavity (4.8%), avoiding smiling due to the esthetic appearance of teeth (6.3%), waking up at night due to pain (2%), taking days off from work (1.1%), difficult performance of daily activities (1%), feeling less tolerance toward a spouse or environment (2.8%) and reduction of daily activities (2.4%).

The participants once or more times a day consumed the following food: fresh fruit (37%), cookies, creams, cakes (14.1%), pies, scones (9.7%), jams or honey (8.5%), chewing gum with sugar (13.2%), candies and chocolate (19.1%), lemonade, Coca-Cola, soda (15.8%), tea with sugar (9.6%), and coffee with sugar (27.4%). Regarding tobacco products, almost one-third of the participants consumed cigarettes (31%), cigars (9%), but only 1 or 2 participants (0.1%) used pipes, Cuban cigars, or chewing tobacco. Every fourth participant (25.5%) did not drink alcohol in the last thirty days. Regarding education, the largest part of the study group had high school education (64.8%), less than a third (26.8%) was university-educated, and only 1% had a PhD degree.

The reliability of the "Oral Health Questionnaire for Adults" (items considering Oral Health Self-Assessment) had high internal consistency: the Cronbach's coefficient was 0.879 (Table 3). The intra-class correlation coefficient was significant (0.874, $p < 0.001$).

Following the Principal component analysis and Promax rotation, 1 factor with Eigenvalue exceeding 1 was observed, accounting for 54.3% of the total variance (Table 4).

Table 3

Descriptive statistics for the "Oral Health Questionnaire for Adults" among the Serbian military personnel (items considering Oral Health Self-Assessment), with corrected item-scale correlations and Cronbach's alpha values, if the item is deleted

Items	Mean ± standard deviation	Corrected item-total correlation	Cronbach's alpha if item deleted	Cronbach's alpha coefficient	Intra-class correlation coefficient
Difficulty biting food	1.3 ± 0.7	0.622	0.861	0.879	0.874 ($p < 0.001$)
Difficulty chewing food	1.2 ± 0.7	0.671	0.856		
Difficulty with speech/ pronouncing words	1.1 ± 0.4	0.569	0.864		
Dry mouth	1.2 ± 0.6	0.415	0.873		
Felt embarrassed due to the appearance of teeth	1.3 ± 0.7	0.670	0.857		
Felt tense because of problems with teeth or mouth	1.3 ± 0.6	0.664	0.857		
Have avoided smiling because of teeth	1.3 ± 0.7	0.662	0.857		
Had sleep that is often interrupted	1.1 ± 0.5	0.590	0.863		
Have taken days off work	1.1 ± 0.4	0.448	0.871		
Difficulty doing usual activities	1.1 ± 0.4	0.602	0.864		
Felt less tolerant of a spouse or people who are close to you	1.1 ± 0.4	0.565	0.865		
Have reduced participation in social activities	1.1 ± 0.5	0.390	0.873		

Table 4

Factor analysis with Promax Rotation Method for the "Oral Health Questionnaire for Adults" among Serbian military personnel (items considering Oral Health Self-Assessment)

Items	Component matrix 1	Communalities
Difficulty biting food	0.740	0.542
Difficulty chewing food	0.731	0.588
Difficulty with speech/ pronouncing words	0.731	0.419
Dry mouth	0.728	0.247
Felt embarrassed due to the appearance of teeth	0.696	0.693
Felt tense because of the problems with teeth or mouth	0.693	0.635
Have avoided smiling because of teeth	0.682	0.654
Had sleep that is often interrupted	0.656	0.494
Have taken days off work	0.647	0.515
Difficulty doing usual activities	0.547	0.615
Felt less tolerant of a spouse or people who are close to you	0.497	0.515
Have reduced participation in social activities	0.493	0.593
% variance	54.3	

Discussion

Considering the lack of adequate data on oral health status of professional members of the Serbian Armed Forces, the main goal of our work was to translate the "Oral Health Questionnaire for Adults" from English into Serbian and apply it to the military population.

The WHO manual "Oral Health Surveys – Basic Methods" has encouraged countries to conduct standardized oral health surveys that are comparable internationally. The WHO Global Oral Health Data Bank collates the data gathered through country surveys on the burden of oral disease [5].

Oral health is a key indicator of overall health, well-being, and quality of life. WHO defines oral health as "a state of being free from chronic mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial well-being" [15]. The Global Burden of Disease Study 2016 estimated that oral diseases affected at least 3.58 billion people worldwide, with caries of the permanent teeth being the most prevalent of all conditions assessed. Globally, it is estimated that 2.4 billion people suffer from caries of permanent teeth and 486 million children suffer from caries of primary teeth [16].

The "Oral Health Questionnaire for Adults" has been used in national surveys in many countries [17, 18]. We used the Serbian version of the questionnaire "Oral Health Questionnaire for Adults" in our study according to recommendations of WHO [4]. The recommendation of WHO is to use a single questionnaire to form the global database, but each country has the right and possibility to adjust certain questions to their needs. After the translation of the questionnaire and a successful conduction of the pilot study, we conducted the study of self-assessment of oral health with 1,741 professional members of the Serbian Armed Forces.

All participants who took part in the study responded to each question from the questionnaire, i.e. the response rate was 100% to all questions. This indicates that all questions were clear, concrete and understandable. The items that might be reducing the consistency of the "Oral Health Questionnaire for Adults" among Serbian military personnel (items considering Oral Health Self-Assessment) were: "Dry mouth" and "Have reduced participation in social activities". Also, one item only ("Dry mouth") had low communality (0.247) in our study. However, the questions were asked by 2 dentists trained in the use of this questionnaire, who explained the meaning of the questions to all participants in the best possible way, which minimized the potential impact of information bias.

The largest number of the participants (85.6%) had more than 20 teeth, which is almost identical to the results of the national study made in Chile [19].

In our study, the condition of teeth is described as very good, good and excellent by 57.9% participants. In a study conducted also among the military population, it was found that dental hygiene could be affected by the self-assessment of dental condition. Participants who brush their teeth less than twice a day evaluated their oral health as poor 3.08 times more often compared to those who brush their teeth more than twice a day [20].

In a national study in Canada [21], 84% of respondents rated their dental condition as good or excellent, while in our study only 57.9% of the participants rated their oral health as good or excellent. This is probably because the awareness of the importance of oral health is not yet sufficiently established in our country. Many factors influence how often people use dental services. The reason a person seeks dental care is influenced by the type of care they are likely to receive and the level of untreated problems they may have at any time. People who visit a dental professional for a routine check-up are most likely to benefit from early detection and treatment and receive preventive ser-

vices. Those who seek care for a dental problem may receive less comprehensive treatment and are less likely to receive preventive services [22].

Certain health habits are the main cause of oral disease. Poor or uncontrolled dietary habits, tobacco, unhealthy lifestyle, avoidance of oral health check-ups are all detrimental to the oral well-being of individuals [23].

Toothbrushing is considered a fundamental self-care behavior for the maintenance of oral health, and brushing twice a day has become a social norm, but the evidence base for this frequency may be weak [24]. In many countries, including America and Australia, brushing twice a day has become the social norm [24]. The largest part of our study group brushed teeth 2 or more times a day. A previous study of the Chinese population showed that, in general, a high percentage of the 2,105 respondents reported inadequate oral hygiene practices (i.e. 66.7% or 1,402 of respondents brushed their teeth once a day or less) [25]. More than half of our research group (55.3%) visited the dentist less than 6 months ago, which is similar to a study done in Canada [26]. The frequency of dental visits was also positively associated with dental brushing, toothpaste use, high educational level, being married, having more than 20 teeth, and having dental pain. w[27]. Besides toothbrush, as the basic means for the maintenance of oral hygiene, 27.86% of participants used dental floss, while 31.36% used mouthwash. In the study done in Malaysia, 20.2% of participants used mouthwash, and 18.9% of them used dental floss [28].

5.1% of participants had difficulties chewing food in the last 12 months, which is significantly less regarding the study that included a large number of European countries, where 14% of the study group had difficulty chewing due to teeth and mouth problems [29].

Most food and drinks have little noticeable effects on dental health. Among the drinks that are most likely to damage teeth and restorative materials are sports and energy drinks which contain sugar to feed oral bacteria, and drinks which have a low pH which can erode teeth and increase their sensitivity [30].

Regarding nutrition habits, 19% of participants in the European study drank Coca-Cola and other sodas daily [29], while in our study the percentage was 15.8%. As a reason to visit the dentist, 35.4% of participants in our study stated the pain and problems with teeth, palate or mouth, while only 17% of participants in the European study stated that the reason for the last visit to the dentist was pain and problems with teeth. This difference can be sought in insufficient education, fear from a dentist or even worse financial situation [29].

The limitation of this study is that the sample was made only on a sample of the military population, and it is necessary to do a clinical examination in a subsequent study and compare it with the results of our study.

This study aims to encourage national oral health planners to standardize measurements of oral diseases and conditions that are important for the planning and evaluation of oral health programs, and to ensure the comparability of data collected in the general population.

Conclusion

The findings suggest that the Serbian version of the "Oral Health Questionnaire for Adults" can be used for measuring oral health among the personnel of the Serbian Armed Forces. The questionnaire is short, easy to understand, acceptable to patients and feasible to apply at the clinic.

R E F E R E N C E S

1. *Kassebaum NJ, Smith AGC, Bernabé E, Fleming TD, Reynolds AE, Vos T,* et al. GBD 2015 Oral Health Collaborators. Global, Regional, and National Prevalence, Incidence, and Disability-Adjusted Life Years for Oral Conditions for 195 Countries, 1990-2015: A Systematic Analysis for the Global Burden of Diseases, Injuries, and Risk Factors. J Dent Res 2017; 96(4): 380−7.
2. World Health Organization. Global status report on noncommunicable diseases 2010. Description of the global burden of NCDs, their risk factors and determinants. Geneva: World Health Organization; 2011.
3. *Moynihan PJ.* The role of diet and nutrition in the etiology and prevention of oral diseases. Bull World Health Organ 2005; 83(9): 694–9.
4. World Health Organization. Oral health surveys: basic methods. th ed. São Paulo, Brazil: School of Dentistry, University of São Paulo, Brazil; 2013. (English, Portuguese)
5. *Ueno M, Zaitsu T, Shinada K, Ohara S, Kawaguchi Y.* Validity of the self-reported number of natural teeth in Japanese adults. J Investig Clin Dent 2010; 1(2): 79−84.
6. *Matsui D, Yamamoto T, Nishigaki M, Miyatani F, Watanabe I, Koyama T,* et al. Validity of self-reported number of teeth and oral health variables. BMC Oral Health 2016; 17(1): 17.
7. *Ramos RQ, Bastos JL, Peres MA.* Diagnostic validity of self-reported oral health outcomes in population surveys: literature review. Rev Bras Epidemiol 2013; 16(3): 716−28.
8. *Blicher B, Joshipura K, Eke P.* Validation of self-reported periodontal disease: a systematic review. J Dent Res 2005; 84(10): 881−90.
9. *Levin L, Shpigel I, Peretz B.* The use of a self-report questionnaire for dental health status assessment: a preliminary study. Br Dent J 2013; 214(5): E15.
10. *Handa S, Prasad S, Rajashekharappa CB, Garg A, Ryana HK, Khurana C.* Oral Health Status of Rural and Urban Population of Gurgaon Block, Gurgaon District Using WHO Assessment Form through Multistage Sampling Technique. J Clin Diagn Res 2016; 10(5): ZC43−51.
11. *Olusile AO, Adeniyi AA, Orebanjo O.* Self-rated oral health status, oral health service utilization, and oral hygiene practices among adult Nigerians. BMC Oral Health 2014; 14: 140.
12. *Skec V, Macan JS, Susac M, Jokic D, Brajdic D, Macan D.* Influence of oral hygiene on oral health of recruits and professionals in the Croatian Army. Mil Med 2006; 171(10): 1006−9.
13. *Beaton DE, Bombardier C, Guillemin F, Ferraz MB.* Guidelines for the process of cross-cultural adaptation of self-report measures. Spine (Phila Pa 1976) 2000; 25(24): 3186−91.

14. *Gliklich RE, Dreyer NA, Leavy MB, Christian JB*. 21st Century Patient Registries: Registries for Evaluating Patient Outcomes: A User's Guide: 3 rd. ed. Addendum [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2018 Mar. Report No.: 17(18) - EHC013 - EF.

15. *Petersen PE*. The World Oral Health Report 2003: continuous improvement of oral health in the 21st century - the approach of the WHO Global Oral Health Programme. Community Dent Oral Epidemiol 2003; 31 Suppl 1: 3−24.

16. GBD 2016 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet 2017; 390(10100): 1211−59.

17. *Kim N, Kim CY, Shin H*. Inequality in unmet dental care needs among South Korean adults. BMC Oral Health 2017; 17(1): 80.

18. National Center for Dental Hygiene Research & Practice and the Canadian Dental Hygienists Association. Proceedings from the 4th Global Dental Hygiene Research Conference: "Translating Knowledge to Action". J Dent Hyg 2018; 92(Suppl 1): 4−55.

19. *Urzua I, Mendoza C, Arteaga O, Rodríguez G, Cabello R, Faleiros S,* et al. Dental caries prevalence and tooth loss in chilean adult population: first national dental examination survey. Int J Dent 2012; 2012: 810170.

20. *Lekić M, Lazić Z, Pandjaitan Donfrid P, Bokonjić D, Lemić T, Daković D*. Assessment of oral health of the Serbian armed forces members. Vojnosanit Pregl 2020; OnLine-First Issue 00, Pages: 111−111. DOI: https://doi.org/10.2298/VSP180414111L

21. Canadian Dental Association. The State of Oral Health in Canada. Available from: www.cda-adc.ca › stateoforalhealth (accessed 2019 January 4).

22. *Chrisopoulos S, Harford JE, Ellershaw A*. Oral health and dental care in Australia: key facts and figures 2015. Canberra: AIHW; 2016.

23. *Mbagwu F, Okoye I, Umunnakwe G.*Oral health disease and library service delivery among library staff of the universities in Nigeria. (2019). Library Philosophy and Practice (e-journal). 2220. Available from: https://digitalcommons.unl.edu/libphilprac/2220.

24. *Kumar S, Tadakamadla J, Johnson NW*. Effect of toothbrushing frequency on incidence and increment of dental caries: a systematic review and meta-analysis. J Dent Res 2016; 95(11): 1230–6.

25. *Su L, Liu W, Xie B, Dou L, Sun J, Wan W* et al. Toothbrushing, blood glucose and HbA1c: findings from a random survey in Chinese population. Sci Rep 2016; 6: 28824.

26. The First Nations Information Governance Centre. Report on the Findings of the First Nations Oral Health Survey (FNOHS) 2009-10. Ottawa: The First Nations Information Governance Centre; 2012.

27. *Rostam Beigi M, Shamshiri AR, Asadi-Lari M, Hessari H, Jafari A*. A crosssectional investigation of the relationship between complementary health insurance and frequency of dental visits in 15 to 64 years old of Tehran population, Iran, a secondary data analysis (urban HEART-2). BMC Health Serv Res 2019; 19(1): 678.

28. Mitha S, ElNaem MH, Chandran J, *Rajah NP, Fam TY, Babar MG*, et al. Use of Oral Cleaning Devices and Their Perceived Benefits among Malaysians in Kuala Lumpur and Johor Bahru: An Exploratory Structured Approach. J Pharm Bioallied Sci 2018; 10(4): 216–25.

29. TNS Opinion & Social. Report. Oral health. Eurobarometer 329, Wave 72.3. Brussels: European Commission; 2010.

30. *Erdemir U, Yildiz E, Saygi G, Altay NI, Eren MM, Yucel T*. Effects of energy and sports drinks on tooth structures and restorative materials. World J Stomatol 2016; 5(1): 1−7.