



## ORIGINAL ARTICLE / ОРИГИНАЛНИ РАД

# Translation and psychometric performance of the Serbian version of the Sarcopenia Quality of Life (SarQoL<sup>®</sup>) questionnaire

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## SUMMARY

**Introduction/Objective** The Sarcopenia Quality of Life (SarQoL<sup>®</sup>) questionnaire is a patient-reported outcome measure specific to sarcopenia.

The objective was to translate the SarQoL<sup>®</sup> questionnaire from English into Serbian and to investigate its psychometric performance.

**Methods** A five-stage forward-backward methodology with pre-test was used to translate the questionnaire. The validation sample in this study consisted of elderly, community-dwelling volunteers of both sexes. Three methods were used to screen for and diagnose sarcopenia: the SARC-F questionnaire (high/low risk), low handgrip strength [probable sarcopenia in the European Working Group on Sarcopenia in Older People (EWGSOP2) algorithm], and the complete EWGSOP2 criteria. We investigated the questionnaire's discriminative power, internal consistency, construct validity, and floor and ceiling effects.

**Results** The SarQoL<sup>®</sup> questionnaire was translated into Serbian. The validation study included 699 participants. In total, 200 participants were considered to be at high risk of sarcopenia by the SARC-F, 84 were diagnosed with low handgrip strength and 12 were confirmed to be sarcopenic. We did not find significantly lower overall QoL scores using the EWGSOP2 criteria (60.31 vs. 64.60;  $p = 0.155$ ). We did find lower scores for the probably sarcopenic group (52.80 vs. 65.50;  $p < 0.001$ ) and the high-risk group (50.91 vs. 69.02;  $p < 0.001$ ). The Cronbach's  $\alpha$  coefficient was 0.87, indicating a high internal consistency. Construct validity was adequate, with 75% of hypotheses on expected correlations with the SF-36 and EQ-5D questionnaires confirmed. No floor or ceiling effects were observed.

**Conclusion** We successfully translated the SarQoL<sup>®</sup> into Serbian, and showed that it is a valid tool for measuring QoL in the community-dwelling elderly.

**Keywords:** sarcopenia; quality of life; SarQoL, validation

## INTRODUCTION

In 2010 the European Working Group on Sarcopenia in Older People (EWGSOP) presented its consensus definition for sarcopenia [1], and in 2019, they revised their criteria (EWGSOP2) and stated that, "Sarcopenia is a progressive and generalized skeletal muscle disorder that is associated with increased likelihood of adverse outcomes including falls, fractures, physical disability and mortality" [2]. Sarcopenia is associated with morbidity and mortality from linked physical disability, as well as with adverse outcomes including frailty, falls and fractures, poor quality of life, depression and hospitalization [3]. In the European context, the EWGSOP2 (which updates the 2010 EWGSOP criteria) are the most widely accepted. Reported prevalence rates of sarcopenia vary greatly due to differing definitions, tools of diagnosis, and patient populations [4]. Globally, the population share aged 65 years or over increased from 6% in 1990 to 9% in 2019. That proportion is projected to rise

further to 16% by 2050, so that one in six people in the world will be aged 65 years or over [5, 6]. Even with a conservative estimate of prevalence, sarcopenia affects more than 50 million people today and will affect over 200 million in the next 40 years [2]. Serbia has one of the largest elderly population segments in the world. The population share of aged 65 and over is 19.4%, while the aging index (population aged 60 years and over as a proportion of those aged 0–19 years) equaled 114.3% [7, 8].

Until 2015, researchers only had generic questionnaires, such as the SF-36, available to assess the quality of life of sarcopenic patients. These questionnaires are designed for use in broad populations and may thus not be sensitive enough to accurately measure the quality of life in sarcopenic populations [9]. To address this problem, Beaudart et al. [10] developed the Sarcopenia Quality of Life (SarQoL<sup>®</sup>) questionnaire. The SarQoL<sup>®</sup> questionnaire is a non-diagnostic instrument but a patient-reported outcome measure specific to sarcopenia.

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The SarQoL® questionnaire consists of 22 questions incorporating 55 items, which fall into seven domains of health-related quality of life. These domains are “Physical and Mental Health,” “Locomotion,” “Body Composition,” “Functionality,” “Activities of Daily Living,” “Leisure activities,” and “Fears”. Each domain is scored from 0 to 100, and an Overall QoL score is calculated. The questionnaire is auto-administered and takes 10 min to complete [10]. The questionnaire is available in 30 languages and can be found on its webpage [11]. The psychometric properties of the SarQoL® have already been demonstrated [12] and it has been validated for several languages such as English [13], Romanian [14], Hungarian [15], Polish [16], Greek [17], Dutch [18], Spanish [19], Lithuanian [20] and Russian [21], but so far, the SarQoL® was not available in Serbian.

To ensure the usability and cultural suitability of the questionnaire, it is necessary to involve the target population in the translation process, with the aim of maximizing compatibility, improving quality and completeness and adaptation to cultural differences. The objective of this study was to translate the SarQoL® questionnaire into Serbian language and to investigate the discriminative power, construct validity, internal consistency and presence of floor or ceiling effects.

## METHODS

The translation of the SarQoL® questionnaire into Serbian was performed according to the translation guidelines formulated by Beaton et al. [22]. Five different phases were followed. First, there were two initial independent translations from English into Serbian by professional translators, both Serbian native speakers. In phase two, the synthesis of the two translations was done to provide a single “first version” of the translated questionnaire. Next phase included the backward translation by two independent translators, unfamiliar with the original English version. The expert committee was established, and it included four translators, one Serbian and one English linguist. They reviewed and compared the back translations with the original questionnaire and consent was given for the “second version” of the translated questionnaire in phase four. In the last phase, the “second version” of the questionnaire was administered to 25, older, community-dwelling subjects from both genders, who afterwards gave their feedback about the comprehensibility of and the language used in the questionnaire as well as any cultural issues present in the questionnaire’s questions. That information was included in the “final version” of the Serbian SarQoL®.

The sample in this study consisted of community dwelling volunteers of both sexes, recruited through Pensioners’ association of Novi Sad, Serbia, from March to June 2019. Inclusion criteria were 65 years of age or older, native Serbian speaker, and able to understand and complete the study related questionnaires. Participants were excluded if they were immobilized, had an amputated limb, suffered from an unstable chronic and/or severe medical disease, or from any neuropsychiatric disorder that could influence their

collaboration. All procedures performed in studies were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Written informed consent was obtained from all individual participants included in the study.

We used three different ways to screen and diagnose sarcopenia. SARC-F questionnaire was used for quick screening and rapid diagnosis, hand grip strength (HGS) has been used as important index of low muscle strength and EWGSOP2 criteria were used to diagnose sarcopenia.

Osteodensitometry provided data of appendicular skeletal mass, representing the sum of lean mass at upper and lower limbs and when divided with height squared, is used to obtain skeletal muscle index. Patients were considered to have low muscle mass when the appendicular skeletal mass was < 15 kg in women and < 20 kg in men, or the skeletal muscle index was < 5.5 kg/m<sup>2</sup> in women and < 7.0 kg/m<sup>2</sup> in men [2]. In this study we used GE Healthcare Lunar iDXA (GE Healthcare, Chicago, IL, USA).

Malmstrom and Morley [23] developed a questionnaire called SARC-F, simple, secure and inexpensive screening tools with good performance convenient and helpful to the medical staff to screen patients for sarcopenia. The questionnaire comprises of five questions about strength, assistance in walking, rising from a chair, climbing stair and falls. Each component is given 0–2 points; a total score of the questionnaire is between 0 and 10 points, with score ≥ 4 points is reported to be predictive of sarcopenia [3]. Previous investigations on the diagnostic accuracy of the SARC-F questionnaire for sarcopenia diagnosed with the EWGSOP2 criteria have shown that this tool possesses moderate to high sensitivity and specificity. A meta-analysis based on four studies found a sensitivity of 77% (95% CI: 49–92%) and a specificity of 63% (95% CI: 43–79%) [24].

The Sammons Preston Jamar hydraulic hand dynamometer (Patterson Companies, Patterson Medical Supply Inc., St Paul, MN, USA) was used as method for muscle strength measurement. Participants were seated in a standard chair, six measures were taken, three with each arm and the highest result of both hands is reported as the final value [25]. Low muscle strength was defined as grip strength values of < 16 kg for women and < 27 kg for men [2].

Physical performance was evaluated with usual gait speed on a four-meter track as part of Short Physical Performance Battery test. Values under ≤ 0.8 m/s of gait speed were used as the threshold for identifying low gait speed and poor physical performance [2].

Besides the SarQoL-Srb®, two other questionnaires were administered to the population, the SF-36 questionnaire and The European Quality of Life 5-Dimension-3 Level questionnaire.

We validated the psychometric properties of the SarQoL-Srb® by assessing its discriminative power, internal consistency, and potential floor and ceiling effects, followed by determination of the construct validity according to recommendations proposed by Terwee et al. [26].

The SarQoL® questionnaire is an instrument designed specifically for the purposes of the sarcopenic population

with its discriminative power, and as such should have the ability to differentiate between sarcopenic and nonsarcopenic subjects on the overall quality of life score. Internal consistency, a measure of the questionnaire's homogeneity, was assessed with the Cronbach's  $\alpha$  coefficient. By deleting one domain at a time, each domain's impact on the internal consistency of the questionnaire was also considered. The correlation of each domain with the total score of the SarQoL-Srb<sup>®</sup> was also assessed using Pearson's correlations, and using Pearson's or Spearman's correlations in function of the score distributions [27]. The construct validity examines whether the questionnaire really measures the construct it claims to measure. We evaluated hypotheses on the expected correlations between SarQoL<sup>®</sup> and similar or different domains of the other two questionnaires. For the convergent validity, the hypotheses for this study are that strong correlations will be found between the Overall score of the Serbian SarQoL<sup>®</sup> questionnaire and the domains "Physical Functioning," "Vitality," and "Role Limitation due to Physical Problems" of the SF-36; as well as between the Overall score of the Serbian SarQoL<sup>®</sup> questionnaire and the Utility Index of the EQ-5D. Divergent validity examines correlations between the SarQoL<sup>®</sup> questionnaire and domains of other questionnaires that should, in theory, be different. The hypotheses are that weak correlations will be found between the Overall score of the Serbian SarQoL<sup>®</sup> questionnaire and the domains "Mental Health" and "Role Limitation due to Emotional Problems" of the SF-36 questionnaire. We also expected

to find weak correlations between the Overall score of the Serbian SarQoL<sup>®</sup> questionnaire and the questions related to Self-Care and Anxiety/Depression of the EQ-5D. The questionnaire possesses good construct validity if at least 75% of the hypotheses are confirmed [26]. Floor and ceiling effects are observed when more than 15% of respondents obtain either the highest score (ceiling effect) or the lowest score (floor effect) possible.

All analyses described here were performed using Python 3.6 (Python Software Foundation, Wilmington, DE, USA) and R 3.0.1 (R Core Team, Vienna, Austria) programming languages, with a level of significance of  $\alpha = 0.05$ .

## RESULTS

Initially, 700 participants were included in study, but one withdrew informed consent so 699 subjects were screened for sarcopenia. The median age was 70 (67–74) years, the sample consisted of 191 male participants (27.3%), and 508 were female (72.7%). A total of 12 patients were diagnosed as sarcopenic as they fulfilled the criteria for sarcopenia according to the EWGSOP2 definition.

In our study group, sarcopenic subjects were significantly older and had a lower BMI compared to non-sarcopenic individuals 76 (72–80.25) vs. 70 (67–74) years ( $p = 0.004$ ) and 29.55 (26.25–32.55) vs. 26.60 (24.83–28.84) kg/m<sup>2</sup> ( $p = 0.014$ ). The complete clinical characteristics are shown in Table 1.

**Table 1.** Descriptive data of the sample

Parameters	All (n = 699)	No sarcopenia (n = 687)	Sarcopenia (n = 12)	p-value
Age (years)	70 (67–74)	70 (67–74)	76 (72–80.25)	0.004
Gender				0.855
Women	508 (72.7)	499 (72.6)	9 (75)	
Men	191 (27.3)	188 (27.4)	3 (25)	
Marital formal status				0.051
Single	43 (6.2)	43 (6.3)	0 (0)	
Married	356 (51.4)	354 (51.5)	2 (16.7)	
Relationship	17 (2.4)	17 (2.5)	0 (0)	
Divorced	53 (7.6)	51 (7.4)	2 (16.7)	
Widowed	230 (32.9)	222 (32.3)	8 (66.7)	
Educational status				0.861
Primary education (4 years)	26 (3.7)	26 (3.8)	0 (0)	
Elementary education (8 years)	155 (22.2)	153 (22.3)	2 (16.7)	
Secondary education	355 (50.8)	349 (50.8)	6 (50)	
Higher education	144 (20.6)	140 (20.4)	4 (33.3)	
Master's degree	9 (1.3)	9 (1.3)	0 (0)	
PhD	10 (1.4)	10 (1.5)	0 (0)	
Smoker				0.882
No	632 (90.4)	621 (90.4)	11 (91.7)	
Yes	67 (9.6)	66 (9.6)	1 (8.3)	
Body Mass Index	29.41 (26.2–32.38)	29.55 (26.25–32.55)	26.60 (24.83–28.84)	0.014
Mini-Mental State Exam	29 (26–29.75)	29 (26–30)	28 (26–29)	0.326
Gait speed	0.83 ± 0.24	0.83 ± 0.24	0.60 ± 0.26	0.081
Grip strength	24.5 (19–30)	25 (20–31)	12 (10–14)	< 0.001
Appendicular skeletal mass	18.67 (16.25–22.02)	18.70 (16.38–22.18)	14.38 (13.19–14.93)	< 0.001

Notes: Values are expressed as median (25–75%) for quantitative variables that did not follow a normal distribution and frequencies (percentages) for the categorical variables

**Table 2.** Discriminative power of the SarQoL-Srb®

Tests	EWGSOP2			SARC-F			Grip strength		
	No sarcopenia	Sarcopenia	P <sup>a</sup>	Low risk	High risk	P <sup>a</sup>	Normal	Low	P <sup>a</sup>
N	687	12		499	200		614	85	
D1: Physical and mental health	65.53 (54.43–79.97)	55.53 (49.43–74.13)	0.136	72.20 (59.53–85.53)	52.20 (45.26–59.62)	<0.001	66.63 (55.53–81.56)	55.53 (44.43–68.87)	< 0.001
D2: Locomotion	53.12 (47.22–68.89)	54.17 (43.75–80.56)	0.953	55.56 (50–72.22)	50 (44.27–58.33)	<0.001	53.87 (47.22–63.89)	50 (44.44–61.11)	0.013
D3: Body composition	66.67 (54.17–79.17)	58.33 (44.79–62.50)	0.104	70.83 (58.33–83.33)	54.17 (45.83–66.67)	<0.001	66.67 (54.17–79.17)	58.33 (50–75)	< 0.001
D4: Functionality	71.15 (57.69–83.01)	63.46 (43.44–62.37)	0.136	77.08 (67.31–87.50)	52.08 (45.73–61.54)	<0.001	73.08 (60.49–83.93)	55.77 (46.15–73.08)	< 0.001
D5: Daily activities	61.67 (48.33–75)	55 (44.81–61.67)	0.059	66.67 (58.33–78.33)	45 (36.67–56.67)	<0.001	63.33 (51.67–75)	48.33 (38.46–61.67)	< 0.001
D6: Leisure activities	33.25 (33.25–66.50)	33.25 (29.09–54.03)	0.799	33.25 (33.25–66.50)	33.25 (16.62–33.25)	<0.001	33.25 (33.25–66.50)	33.25 (16.62–49.88)	0.009
D7: Fears	87.50 (87.50–100)	87.50 (75–100)	0.259	100 (87.50–100)	87.50 (75–87.50)	<0.001	87.50 (87.50–100)	87.50 (75–100)	< 0.001
Overall score	64.60 (54.93–74.50)	60.31 (44.48–68.85)	0.155	69.02 (61.94–77.98)	50.91 (44.76–57.01)	<0.001	65.50 (56.01–75.25)	52.80 (45.71–66.17)	< 0.001

<sup>a</sup>All p-values were obtained with Mann–Whitney U-test for independent samples

**Discriminative power**

Sarcopenic subjects by EWGSOP2 have reported slightly lower global quality of life scores compared to non-sarcopenic subjects (60.31 (44.48–68.85) vs. 64.60 (54.93–74.50), p = 0.155). The domains of physical and mental health, locomotion, functionality and daily activities were also scored lower in sarcopenic subjects compared to non-sarcopenic ones (Table 2).

SARC-F divided the study group to 200 subjects (28.6%) who were at high risk of sarcopenia, and their quality of life was significantly reduced in SarQoL® (69.02 (61.94–77.98) vs. 50.91 (44.76–57.01) p < 0.001) and they scored significantly lower in all domains when compared to subjects with low risk for sarcopenia (Table 2).

When the sample was divided into those with low grip strength versus those with normal grip strength, we had 85 subjects (12.1%) with low grip strength. They had significantly lower global quality of life in SarQoL® (65.5 (56.01–75.25) vs. 52.8 (45.71–66.17) p < 0.001) and all domains were scored significantly lower comparing to group with normal grip strength (Table 2).

**Internal consistency**

The Cronbach’s α of the Serbian version of the SarQoL® was 0.87, indicating a high internal consistency. Deleting the domains one at the time, led to Cronbach’s α values varying between 0.83 (when deleting the domain four “Functionality”) and 0.89 (for the domain six “Leisure activities”). When comparing each domain with the SarQoL® total score, a significant positive correlation for all domains was observed with values ranging from good (0.41, D6 – leisure activities) to excellent (0.92, D4 – functionality) as shown in Table 3.

**Construct validity**

The results of construct validity are available in Table 4. As expected, strong/good correlations were found between the SarQoL® and some domains of the SF-36 questionnaire which were supposed to have similar dimensions such as physical functioning (SF-36-PF and role limitation due to physical problems (SF-36-RLPP as well as with the utility score of the EQ-5D questionnaire) and the questions of the EQ-5D questionnaire related to mobility and usual activities. There are four hypotheses for convergent validity, each being that there are moderate to strong correlations

**Table 3.** Intercorrelations between the Serbian SarQoL® questionnaire total and domains scores (n = 699)

Activities	D1	D2	D3	D4	D5	D6	D7	Overall
	Rho	Rho	Rho	Rho	Rho	Rho	Rho	Rho
D1	1							
D2	0.43*	1						
D3	0.69	0.34*	1					
D4	0.75*	0.42*	0.58*	1				
D5	0.7*	0.41*	0.53*	0.77*	1			
D6	0.29*	0.11*	0.27*	0.37*	0.34*	1		
D7	0.54*	0.29*	0.41*	0.55*	0.50*	0.27*	1	
Overall	0.85*	0.57*	0.68	0.92*	0.90*	0.41*	0.60*	1

\*Correlation is significant at the 0.05 level (two tailed); D1 – physical and mental health; D2 – locomotion; D3 – body composition; D4 – functionality; D5 – daily activities; D6 – Leisure activities; D7 – Fears

**Table 4.** Construct validity (n = 699)

Convergent validity	Rho	p
SF-36 Physical functioning	0.760	0.002
SF-36 Role limitation due to physical problems	0.637	0.001
SF-36 Vitality	0.656	0.005
EQ-5D Index score	0.589	< 0.001
Divergent validity		
SF-36 Role limitation due to emotional problems	0.490	< 0.001
SF-36 Mental health	0.474	< 0.001
EQ-5D Anxiety	-0.332	< 0.001
EQ-5D Self care	-0.332	< 0.001

expected between SarQoL overall score and SF-36-PF, SF-36-VIT, SF-36-RLPP and the EQ-5D-UI. All of the mentioned correlations are strong as is shown by the values in Table 4. The hypotheses for divergent validity claim that we expect weak or no correlations between SarQoL Overall score and SF-36-MH, SF-36RLEP, EQ-5D-SC and EQ-5D-AD. Out of these four correlations, two are relatively weak, with the two EQ-5D items, and the remaining two (MH and RLEP) show moderate strength in the correlation. The two positive correlations go against the hypotheses, leaving 75% of the hypotheses confirmed, which is incidentally the cut-off used to evaluate construct validity. Considering these results, we can conclude that SarQoL-Srb<sup>®</sup> has had its construct validity confirmed.

### Floor and ceiling effects

No subjects presented with the lowest score to the questionnaire (0 points) or the maximum score (100 points) on the overall QoL score of the Serbian SarQoL<sup>®</sup> questionnaire. Therefore, neither floor or ceiling effects were found for the questionnaire.

### DISCUSSION

The SarQoL<sup>®</sup> is the first quality of life questionnaire specifically developed for sarcopenia. The present study was conducted following a standardized validation protocol as advised by the creators of the original SarQoL<sup>®</sup> questionnaire. The transcultural adaptation resulted in a valid Serbian version, psychometrically matched with the original version. Its high internal consistency, and construct validity certifies the measurement quality of the translated version. A meticulous methodology was used, providing protection against subjectivity in the translation and assuring equivalence between the original English SarQoL<sup>®</sup> questionnaire and the Serbian translation. The time required to complete the Serbian SarQoL<sup>®</sup> was between 10 and 20 minutes, longer than the time reported by Beaudart et al. [13].

We enlisted a reasonably adequate cohort of older individuals for screening hoping to collect a representative sample of people with sarcopenia but out of 699 subjects, we had only 12 with sarcopenia as diagnosed with the EWGSOP2 criteria. Our hypothesis to explain very low prevalence of sarcopenia is that those who applied to participate in the study may be from a more physically and psychologically active group who tend to also take part in activities like hiking, dancing and other social events, organized medical check-ups, in their pensioners' association. This means that the study participant selection may have introduced a bias and focused on the healthier section of population. In our study group, sarcopenic subjects were significantly older and had a lower BMI compared to non-sarcopenic individuals and there was a higher proportion of widows/widowers in the sarcopenic group.

In the analysis of discriminative power, when HGS and SARC-F questionnaire were used, all domains and overall quality of life had lower results with significant p-values.

Our analysis showed that when the EWGSOP2 criteria were applied, sarcopenic subjects reported a slightly lower global quality of life compared to non-sarcopenic subjects in the Serbian SarQoL<sup>®</sup> total score. The domains of D1-physical and mental health, D3-body composition, D4-functionality and D5- activities of daily living were also lower scored in sarcopenic subjects compared to non-sarcopenic ones. We found no differences for D2-locomotion, same as Fábrega-Cuadros et al. [19] in the Spanish SarQoL<sup>®</sup> validation, in D6 – Leisure activities as Gasparik et al. [14] in the Romanian validation, and also in D7-Fears. Differences found when sample was divided on a basis of HGS and SARC-F might be due to larger groups. We had just 12 subjects with all EWGSOP2 criteria in regard to 200 subjects with high risk for sarcopenia based on SARC-F score and 85 with low hand grip. The diagnostic performance of the SARC-F in this sample is not in line with what has previously been reported about its sensitivity and specificity. We do not have an explanation for this phenomenon in this specific sample, and we think that a diagnostic accuracy study of the SARC-F in a Serbian population should be performed in the near future [28].

The Cronbach's  $\alpha$  coefficient of the Serbian version of the SarQoL<sup>®</sup> was 0.87, indicating a high internal consistency. Deleting the domains one at the time, led to Cronbach's  $\alpha$  values varying between 0.83 (when deleting the domain 4 "Functionality") and 0.89 (for the domain 6 "Leisure activities"). When comparing each domain with the SarQoL<sup>®</sup> total score, a significant positive correlation for all domains was observed with values ranging from good (0.41, D6 – leisure activities) to excellent (0.92, D4 – functionality). The specificity of the Serbian version of the SarQoL survey is that it shows a strong positive correlation of the domain D7-Fears. The correlation can be attributed to the unstable political and economic environment which has led to a fall in the quality of social and health services provided. The fall is especially prevalent in the support given by health workers in helping those who have lost their independence in daily life activities.

As expected, strong/good correlations were found between the Serbian version of the SarQoL<sup>®</sup> and some domains of the SF-36 questionnaire as with the utility score of the EQ-5D. We found weaker correlations between domains of the Serbian version of the SarQoL<sup>®</sup> which were supposed to have different dimensions. These results are in congruence with those reported in other studies [9, 13, 14].

This study has some limitations. Firstly, our sample only comprises 12 sarcopenic subjects (1.7%) which is much lower comparing to other studies and thus this population does not reflect exactly a sarcopenic population [12, 13, 20, 27]. Our study participant selection may have introduced a bias and focused on the healthier section of population by relying on volunteers despite the known fact that sarcopenic individuals are less likely to volunteer for clinical studies due to their physical difficulties [4]. The sample that was recruited for this study was not a random sample and should be complemented with participants from nursing homes or elderly more dependent on their care providers. Another limitation of this study is due to the issues related to the lack of a test-retest reliability evaluation. However,

test-retest reliability at a two-week interval has shown to be excellent in the other validation of the SarQoL® and should therefore not be an issue [13, 18].

## CONCLUSION

In conclusion, the results of the present study confirm that, the Serbian SarQoL® can discriminate with significant

p-values between older adults with and without sarcopenia if the HGS and SARC-F are used, but we were unable to confirm discriminative power when using the EWGSOP2 criteria in this sample. Also, in Serbian population aged 65 and over, the Serbian version of the SarQoL® shows high internal consistency, as well as good convergent and divergent validity for a sarcopenic population.

**Conflict of interest:** None declared.

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## Превод и психометријске перформансе српске верзије упитника „Квалитет живота са саркопенијом“ (*Sarqol*<sup>®</sup>)

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### САЖЕТАК

**Увод/Циљ** Упитник „Квалитет живота са саркопенијом“ (*SarQoL*<sup>®</sup>) који попуњавају болесници специфичан је за саркопенију.

Циљ је био да се преведе упитник са енглеског на српски језик и испитају његове психометријске перформансе.

**Метод** Упитник је преведен. Испитаници су били пензионери оба пола, старији од 65 година. Три методе су коришћене за утврђивање саркопеније: упитник *SARC-F*, смањена снага стиска и комплетни критеријуми Европске радне групе за саркопенију код старијих особа (*EWGSOP2*). Испитивани су дискриминативна способност, интерна конзистенција, конструкциона валидност, ефекат пода и плафона.

**Резултати** Упитник *SarQoL*<sup>®</sup> је преведен на српски језик. Валидациона студија је спроведена на 699 испитаника. Од укупног броја, 200 учесника припадају високоризичној групи за саркопенију на основу упитника *SARC-F*, 84 испитаника

је имало ослабљену снагу стиска шаке, а 12 потврђену саркопенију. На основу критеријума *EWGSOP2* није установљен значајно мањи квалитет живота (60,31 vs. 64,60;  $p = 0,155$ ). Добијене су ниже вредности упитника *SarQoL*<sup>®</sup> за групу са мањим ризиком за саркопенију (52,80 vs. 65,50;  $p < 0,001$ ) и високоризичну групу за саркопенију (50,91 vs. 69,02;  $p < 0,001$ ). Кронбахов алфа коефицијент је износио 0,87, што указује на високу интерну конзистенцију. Конструктивна валидност је била адекватна и потврђена са 75% и очекиваном корелацијом са упитницима *SF-36* и *EQ-5D*. Није уочен ефекат пода/плафона у добијеним резултатима.

**Закључак** Упитник *SarQoL*<sup>®</sup> је успешно преведен на српски језик и потврђена је његова валидност за утврђивање квалитета живота геријатријске популације.

**Кључне речи:** саркопенија; квалитет живота; *SarQoL*, валидација