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## LETTER TO THE EDITOR

### DISCRIMINATIVE POWER OF THE SARCOPIENIA QUALITY OF LIFE (SARQoL®) QUESTIONNAIRE WITH THE EWGSOP2 CRITERIA

Dear Editor,

The Sarcopenia Quality of Life (SarQoL®) questionnaire was developed in 2015 to fill the need for a specific instrument to measure quality of life in sarcopenia. Since then, its validity and reliability have been evaluated in multiple languages, and it is now available in 30 language-specific versions. In multiple validation studies, the SarQoL® has demonstrated its ability to discriminate between sarcopenic and non-sarcopenic subjects when diagnosed according to the EWGSOP criteria (1). However, these criteria have now been updated, and the discriminative power of the SarQoL® questionnaire should be reaffirmed using the EWGSOP2 criteria (2). The analysis presented below aims to establish whether the SarQoL® questionnaire can discriminate between sarcopenic, probably sarcopenic (low grip strength in the EWGSOP2 algorithm) and non-sarcopenic participants.

This study used data gathered from older, community-dwelling volunteers recruited within the framework of the Sarcopenia and Physical Impairment with advancing Age (SarcoPhAge) cohort (3). The same data was used in the original validation study of the SarQoL® questionnaire (4). The sarcopenia components of muscle mass and muscle strength were measured with, respectively, dual-energy x-ray absorptiometry and a hydraulic hand dynamometer. We applied the thresholds specified by the EWGSOP2 for appendicular lean mass divided by height-squared (ALM/Ht<sup>2</sup>: less than 5.5 kg/m<sup>2</sup> for women and 7 kg/m<sup>2</sup> for men) and handgrip strength (less than 16 kg for women and 27 kg for men) (2). Quality

of life was measured with the SarQoL® questionnaire, which provides an overall QoL score and 7 domain scores for specific aspects of QoL, all between zero (worst QoL) and 100 (best QoL). In line with the case-finding algorithm elaborated by the EWGSOP2, we considered participants to have “probable sarcopenia” when they demonstrated low grip strength, and sarcopenia when both low grip strength and low muscle mass were present (2).

In total, 296 participants, with a median age of 73.3 (68.9-78.6) years, were included in this analysis. In a previous analysis, 43 subjects were diagnosed as sarcopenic with the EWGSOP criteria (4). As expected, we found a lower prevalence of sarcopenia when applying the EWGSOP2 criteria, with 38 participants displaying low grip strength, of which 13 were ultimately considered sarcopenic.

Sarcopenic participants, as diagnosed with EWGSOP2 criteria, had significantly lower scores for all 7 SarQoL® QoL domains (all p<0.05) and the overall QoL score of the SarQoL® questionnaire [45.83 (38.62-60.26) versus 66.43 (56.10-78.26); p<0.001], indicating that the SarQoL® questionnaire can discriminate between sarcopenic and non-sarcopenic individuals. When the sample was categorized in probably sarcopenic (n=38) and non-sarcopenic (n= 258), similar results were obtained. All 7 domain scores of the SarQoL® questionnaire were significantly lower (all p<0.05) for probably sarcopenic participants, as well as the Overall QoL score [53.24 (41.18-63.24) versus 67.74 (57.35-79.02); p<0.001]. Detailed results are presented in table 1.

We investigated the robustness of these results by carrying out binary logistic regression analyses including age, gender, body mass index, n° of comorbidities and n° of medications as covariates. We found that for every one-unit increase in Overall QoL, we expect to see a 10% decrease in the odds of belonging to the EWGSOP2 sarcopenic group (OR: 0.90; 95% CI: 0.85-0.95), and a 6% decrease in the odds of belonging to the EWGSOP2 probable sarcopenia group (OR: 0.94; 95% CI: 0.90-0.97).

**Table 1**  
Discriminative power of the SarQoL® questionnaire using the EWGSOP2 criteria for sarcopenia

	EWGSOP2 sarcopenia				EWGSOP2 probable sarcopenia			
	Not sarcopenic (n=283)	Sarcopenic (n=13)	p <sup>a</sup>	OR (95% CI) <sup>b</sup>	Not sarcopenic (n= 258)	Probably sarcopenic (n=38)	p <sup>a</sup>	OR (95% CI) <sup>b</sup>
(1) Physical and mental health	63.33 (54.43 - 76.67)	55.57 (38.33 - 60.55)	0.006	0.94 (0.89 - 0.98)	63.33 (55.57 - 76.67)	55.57 (45.57 - 63.33)	<0.001	0.96 (0.93 - 0.99)
(2) Locomotion	61.11 (50.00 - 83.33)	30.56 (25.00 - 62.50)	0.004	0.96 (0.93 - 0.99)	61.11 (50.00 - 86.11)	50.00 (27.78 - 61.81)	<0.001	0.97 (0.95 - 0.99)
(3) Body composition	60.00 (50.00 - 70.00)	50.00 (29.58 - 54.17)	0.001	0.92 (0.88 - 0.97)	60.00 (50.00 - 70.83)	50.00 (40.00 - 60.00)	0.003	0.98 (0.95 - 1.00)
(4) Functionality	73.21 (60.71 - 84.62)	53.85 (42.58 - 75.21)	0.002	0.95 (0.91 - 0.98)	75.00 (62.50 - 85.71)	57.69 (45.67 - 72.32)	<0.001	0.96 (0.93 - 0.99)
(5) Activities of daily living	63.33 (51.67 - 80.00)	40.00 (30.51 - 50.00)	0.001	0.92 (0.86 - 0.96)	65.00 (52.98 - 80.00)	48.03 (34.96 - 58.75)	<0.001	0.95 (0.93 - 0.98)
(6) Leisure activities	58.31 (33.25 - 66.75)	33.25 (33.25 - 50.00)	0.008	0.95 (0.91 - 0.99)	66.69 (33.25 - 66.75)	33.25 (33.25 - 50.00)	<0.001	0.97 (0.94 - 0.99)
(7) Fears	87.50 (87.50 - 100.00)	75.00 (75.00 - 100.00)	0.045	0.94 (0.89 - 0.99)	87.50 (87.50 - 100.00)	87.50 (75.00 - 100.00)	0.044	0.98 (0.95 - 1.01)
Overall score	66.43 (56.10 - 78.26)	45.83 (38.62 - 60.26)	<0.001	0.90 (0.85 - 0.95)	67.74 (57.35 - 79.02)	53.24 (41.18 - 63.24)	<0.001	0.94 (0.90 - 0.97)

a. p-value calculated with Mann-Whitney U-test; b. Binary logistic regression adjusted for age, gender, BMI, n° of comorbidities and n° of medications

The current analysis shows that the SarQoL<sup>®</sup> questionnaire retains its capacity to discriminate between sarcopenic and non-sarcopenic persons when using the EWGSOP2 criteria for sarcopenia, despite the reduced prevalence of sarcopenic individuals. These results reinforce the results found during the validation of the Lithuanian version of the SarQoL<sup>®</sup> questionnaire, which also found significantly lower QoL scores for all 7 domains and the overall QoL score between non-sarcopenic and EWGSOP2 sarcopenic participants. The odds ratio found for the overall QoL score in this study is nearly identical to our own, at 0.913 (95% CI 0.876-0.951) (5).

We also found that participants with low grip strength, categorized as probably sarcopenic in the EWGSOP2 algorithm, had significantly lower QoL scores for all 7 domains and the overall QoL score. This is an important finding because it shows that, when an older person is found to have low muscle strength, his or her quality of life is likely to already have been impacted. This adds strength to the EWGSOP argument that the observation of low grip strength in clinical practice could be a sufficient indication to put in place interventions to mitigate and improve a patient's musculoskeletal health.

The SarQoL<sup>®</sup> questionnaire is currently the only sarcopenia-specific QoL questionnaire, and has demonstrated to be able to discriminate between sarcopenic, probably sarcopenic and non-sarcopenic groups. Its use, in combination with the EWGSOP2 criteria, could provide greater detail and precision on the impact of sarcopenia on QoL.

*Conflict of interest:* J-YR, CB and OB are shareholders of SarQoL sprl. AG and ML have no conflicts of interest to declare.

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