

ORIGINAL PAPER/ARTYKUŁ ORYGINALNY

# Validation analysis of the Polish version of the Multiple Sclerosis International Quality of Life Questionnaire (MusiQoL)

## *Analiza walidacyjna polskiej wersji Międzynarodowego Kwestionariusza Jakości Życia w Stwardnieniu Rozsianym (MusiQoL)*

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### Abstract

**Background and purpose:** The aim of this study was to perform a validation analysis of the Polish adaptation of the Multiple Sclerosis International Quality of Life Questionnaire, MusiQoL.

**Material and methods:** Validation analysis included the translation of the original English version into Polish according to translation principles and the analysis of convergent validity, internal reliability and reproducibility of the Polish version of MusiQoL. The study included 150 randomly chosen patients (109 women and 41 men) with definite multiple sclerosis (MS) diagnosed according to McDonald criteria. Mean age of patients was  $41 \pm 10$  years and mean disease duration was  $11.7 \pm 7.2$  years. The patients completed the examined MusiQoL, the Functional Assessment of Multiple Sclerosis (FAMS) and the Multiple Sclerosis Impact Scale (MSIS-29). Data regarding sociodemographic status and MS history were collected. The disability of the patients was assessed according to the Expanded Disability Status Scale (EDSS). The examination was repeated after  $28 \pm 4$  days.

**Results:** The internal reliability, convergent validity and reproducibility of MusiQoL were satisfactory. The dimensions of the scale exhibited high internal consistency (Cronbach's alpha from 0.67 to 0.90). The MusiQoL correlated with FAMS (positive correlations), EDSS and MSIS-29 (negatively).

### Streszczenie

**Wstęp i cel pracy:** Celem pracy była analiza walidacyjna aspektów psychometrycznych polskiej adaptacji Międzynarodowego kwestionariusza jakości życia w stwardnieniu rozsianym (SR) – *Multiple Sclerosis International Quality of Life Questionnaire*, MusiQoL.

**Materiał i metody:** Analiza walidacyjna objęła tłumaczenie oryginalnej wersji angielskiej na język polski zgodnie z obowiązującymi zasadami translacyjnymi oraz analizę aspektów trafności i rzetelności skali MusiQoL. Do badań włączono 150 losowo wybranych pacjentów z rozpoznaniem SR według kryteriów McDonalda (109 kobiet i 41 mężczyzn). Średnia wieku badanych wynosiła  $41 \pm 10$  lat, średni czas trwania choroby –  $11,7 \pm 7,2$  roku. Pacjenci wypełniali badany kwestionariusz MusiQoL, *Kwestionariusz do Oceny Jakości Życia w Stwardnieniu Rozsianym* (FAMS) oraz *Skalę Wpływu Stwardnienia Rozsianego na Jakość Życia Chorych* (MSIS-29). Zebrano dane społeczno-demograficzne pacjentów i dotyczące historii przebiegu choroby. U wszystkich oceniono ponadto stopień niesprawności na podstawie *Rozszerzonej Skali Niewydolności Ruchowej* (EDSS). Badania przeprowadzono w dniu 0, a następnie powtórzono po  $28 \pm 4$  dniach.

**Wyniki:** Rzetelność i badane aspekty trafności polskiej wersji skali MusiQoL są zadowalające. Wykazano również powtarzalność wyników badanej skali oraz dużą spójność wewnętrzną poszczególnych podskal (współczynnik alfa Cron-

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**Conclusions:** Psychometric-statistical analysis showed that the Polish version of MusiQoL is a valuable measure to examine the health-related quality of life of Polish MS patients.

**Key words:** multiple sclerosis, validation analysis, MusiQoL.

## Introduction

The assessment of quality of life in chronic progressive disease, such as multiple sclerosis (MS), is very important for the monitoring of patients' health status and for the evaluation of treatment efficacy. Currently, we may choose among about 20 questionnaires, including several self-reported measures, used to assess the health status of patients with MS. In 2008, Simeoni *et al.* in close collaboration with neurologists from 15 countries (Argentina, Canada, France, Germany, Greece, Israel, Italy, Lebanon, Norway, Russia, South Africa, Spain, Turkey, United Kingdom, and USA) proposed a new scale – the Multiple Sclerosis International Quality of Life Questionnaire (MusiQoL) [1]. This scale reflects specifically the point of view of MS patients on the impact of the disease on their everyday life and evaluates multiple dimensions of patients' life. MusiQoL was developed after interviews with patients, and its international validation was made in a group of 1992 patients [1].

Polish neurologists have quite a limited choice of questionnaires related to quality of life in MS that have been validated and culturally adapted; these include Functional Assessment of Multiple Sclerosis (FAMS) [2], Multiple Sclerosis Impact Scale 29 (MSIS-29) [3], Modified Fatigue Impact Scale (MFIS) [4], and Multiple Sclerosis Quality of Life-54 Instrument (MSQOL-54) [5]. We aimed, therefore, to perform validation analysis of psychometric properties of the Polish adaptation of MusiQoL.

The MusiQoL scale contains 31 items divided into 9 dimensions: activity of daily living (ADL, eight items); psychological well-being (PWB, four items); symptoms (SPT, three items); relationships with friends (RFr, four items); family relationships (RFa, three items); satisfaction with health care system (RHCS, three items); sentimental and sexual life (SSL, two items); coping (COP, two items) and rejection (REJ, two items).

Stwierdzono korelacje skali MusiQoL ze skalą FAMS (korelacje dodatnie), EDSS i MSIS-29 (korelacje ujemne).

**Wnioski:** Analiza psychometryczno-statystyczna wykazała, że polska wersja skali MusiQoL jest wartościowym narzędziem do badania wpływu choroby na jakość życia polskich chorych na SR.

**Słowa kluczowe:** stwardnienie rozsiane, analiza walidacyjna, MusiQoL.

The total MusiQoL score ranges between 0 and 100; lower scores indicate a worse quality of life. The Polish version of MusiQoL can be found in the appendix to this paper.

## Material and methods

The study included 150 randomly chosen patients diagnosed with multiple sclerosis according to McDonald criteria [6] who visited an out-patient Neurological Clinic or were admitted to the Department of Neurology (both institutions in Self-Dependent Public Teaching Hospital No. 4 in Lublin) between December 2008 and May 2010. All patients were adults at the time of examination. Each patient provided written informed consent to participate in the study. The Bioethical Committee of Lublin Medical University approved the protocol of the study.

Language adaptation of the MusiQoL scale was done according to the guidelines [7,8]. Two independent translators, Polish native-speakers, provided the translation of the original English scale into Polish (forward translation). Each item of both translations was analysed and compared with the other version, and the most accurate version of each controversial item was established. Then, the backward translation was performed. It did not reveal any errors of the established proposal when compared with the original version. A neurologist with expertise in MS assessed the translation in relation to the accuracy of the medical terms. The proposed version was used for preliminary testing in 20 patients with MS (10 women and 10 men) who represented different sociodemographic characteristics. Patients provided positive feedback in relation to the understanding of each question, the terminology used, length of questions, usefulness and emotions associated with answering the questions. After the positive opinion, the final version was used in validation analysis.

Before testing, each patient was examined with the Mini Mental State Examination (MMSE) to exclude those with cognitive disturbances; only patients who scored at least 28 points in the MMSE were included in the study [9]. Patients during relapse and those unable to complete the questionnaire without help were also excluded.

Patients were tested twice: at baseline and after an interval of  $28 \pm 4$  days. Each subject was asked to complete the questionnaires related to the assessment of the severity of particular symptoms and quality of life. Questionnaires included FAMS, MSIS-29 and MusiQoL. FAMS and MSIS-29 were chosen as comparators because Polish versions are available and validated [2,3].

Patients were examined by two neurologists and the severity of the patient's disability was assessed with the Expanded Disability Status Scale (EDSS) [10]. To avoid inter-rater discrepancies, each patient was examined by the same neurologist.

Results were characterized with means and standard deviations. Reliability of the MusiQoL scale was tested with the internal consistency provided by Cronbach's alpha coefficient. Construct validity of the scale was assessed by the analysis of the results obtained with MusiQoL in correlation with the duration of the disease and with tests that measure similar features (EDSS, FAMS, and MSIS-29), i.e. convergent validity. Differences between subgroups were also analysed to address the hypothesis on different results of the scale for different MS types. Reproducibility of the scale was also evaluated. A  $p$ -value  $< 0.05$  was considered significant. Statistical analysis was performed with SPSS 14.0 PL statistical package.

## Results

The study comprised 150 patients with MS, including 109 women (73%) and 41 men (27%). Their age ranged between 21 and 66 years (mean: 41, SD: 10 years). Eighty-seven patients (58%) lived in towns and the other 63 (42%) lived in the country.

One hundred and four participants (70%) were married and 46 (30%) were single or widowed. Thirty-one patients (21%) had vocational educational, 75 patients (50%) had secondary (general or technical) school education, and 44 participants (29%) had a university degree. Fifty-nine patients (39%) were employed and 91 patients (61%) received disability pension. Mean

duration of the disease was 11.7 (SD: 7.2) years (range: 1-35). Relapsing-remitting MS was diagnosed in 60 subjects (40%), primary progressive MS was diagnosed in 17 patients (11%), and secondary progressive MS in 73 patients (49%).

Total scores in MusiQoL and the subscores in each dimension for patients with specific MS types are provided in Table 1.

The lowest total scores in MusiQoL as well as in ADL and PWB dimensions were obtained in patients with primary progressive and secondary progressive MS. The lowest score in the SPT dimension was noted in patients with secondary progressive MS, and the lowest score in the REJ dimension was found in patients with primary progressive MS. No significant differences in RFr, RFa, RHCS, SSL or COP dimensions were noted among patients with different types of MS.

As expected, there were no significant differences in total scores or in most of the subscores found in relation to sex (except for a lower score in the PWB dimension among women) or to marital status (except for a higher score in the ADL dimension among single persons).

Patients living in towns had higher scores than their counterparts who lived in the country in ADL ( $44.5 \pm 27.9$  vs.  $33.8 \pm 26.8$ ,  $p < 0.05$ ), PWB ( $60.2 \pm 22.5$  vs.  $48.8 \pm 24.4$ ,  $p < 0.05$ ), and SPT ( $71 \pm 19.5$  vs.  $61.7 \pm 26.8$ ,  $p < 0.05$ ) but scored less in SSL ( $25.8 \pm 24$  vs.  $40.6 \pm 29.9$ ,  $p < 0.01$ ). Patients receiving disability pension had worse health-related quality of life and had a lower total MusiQoL score ( $40.4 \pm 11.5$  vs.  $45.8 \pm 14.1$ ,  $p < 0.05$ ), lower ADL ( $29.6 \pm 22$  vs.  $56 \pm 28.4$ ,  $p < 0.01$ ), SPT ( $61.7 \pm 22.7$  vs.  $75.4 \pm 21.8$ ,  $p < 0.01$ ), and COP ( $46.4 \pm 29.7$  vs.  $57.2 \pm 29$ ,  $p < 0.05$ ) subscores, and higher SSL subscores ( $36.6 \pm 27.5$  vs.  $25 \pm 26.4$ ,  $p < 0.01$ ).

Patients with a university degree had a higher total score in MusiQoL in comparison to subjects with vocational education ( $45.8 \pm 9.9$  vs.  $39.8 \pm 10.6$ ,  $p < 0.05$ ). ADL dimension subscores were also higher in patients with university education in comparison to those with secondary ( $52.7 \pm 29.8$  vs.  $36.5 \pm 26.8$ ,  $p < 0.05$ ) or vocational education ( $52.7 \pm 29.8$  vs.  $30.8 \pm 21.7$ ,  $p < 0.01$ ). Patients with a university degree had higher scores in the SPT dimension than patients with vocational education ( $75.2 \pm 18.1$  vs.  $57.2 \pm 24.7$ ,  $p < 0.01$ ) and in the REJ dimension than patients with secondary education ( $70.4 \pm 25.4$  vs.  $56.8 \pm 34.7$ ,  $p < 0.05$ ).

**Table 1.** MusiQoL total scores and dimension-related subscores in patients with various types of multiple sclerosis (one-way analysis of variance with post-hoc Dunnett test for the differences between group means)

Scale dimension	Multiple sclerosis type	Mean (SD)	Range	p-value
MusiQoL – total score	PP	37.7 (13.9)	19-68	< 0.05 (RR vs. PP patients)
	RR	47.6 (14.1)	17-99	< 0.01 (RR vs. SP patients)
	SP	39.6 (10.0)	17-59	
	Total	42.5 (12.8)	17-99	
MusiQoL – ADL	PP	25.4 (15.7)	0-50	< 0.01 (RR vs. PP patients)
	RR	59.8 (26.3)	3-100	< 0.01 (RR vs. SP patients)
	SP	27.2 (21.1)	0-91	
	Total	40.1 (27.9)	0-100	
MusiQoL – PWB	PP	50.7 (23.4)	19-100	< 0.05 (RR vs. SP patients)
	RR	62.2 (23.3)	13-100	
	SP	50.9 (23.6)	6-100	
	Total	55.4 (24.0)	6-100	
MusiQoL – RFr	PP	33.8 (32.1)	0-100	NS
	RR	32.5 (22.5)	0-100	
	SP	31.8 (24.8)	0-83	
	Total	32.3 (24.6)	0-100	
MusiQoL – SPT	PP	76.1 (20.2)	44-100	< 0.05 (PP vs. SP patients)
	RR	71.2 (25.0)	0-100	
	SP	61.6 (21.4)	13-100	
	Total	67.1 (23.3)	0-100	
MusiQoL – RFa	PP	14.2 (20.1)	0-75	NS
	RR	19.6 (26.4)	0-100	
	SP	19.6 (21.5)	0-92	
	Total	19.0 (23.4)	0-100	
MusiQoL – RHCS	PP	20.6 (18.2)	0-67	NS
	RR	24.4 (22.9)	0-100	
	SP	28.6 (23.2)	0-83	
	Total	26.1 (22.6)	0-100	
MusiQoL – SSL	PP	32.3 (30.6)	0-100	NS
	RR	28.3 (27.4)	0-100	
	SP	35.1 (27.1)	0-75	
	Total	32.1 (27.6)	0-100	
MusiQoL – COP	PP	41.2 (27.2)	0-88	NS
	RR	57.1 (29.8)	0-100	
	SP	47.6 (29.7)	0-100	
	Total	50.7 (29.8)	0-100	
MusiQoL – REJ	PP	44.8 (34.8)	0-100	< 0.05 (RR vs. PP patients)
	RR	72.9 (29.0)	0-100	< 0.01 (RR vs. SP patients)
	SP	53.4 (32.3)	0-100	
	Total	60.2 (32.9)	0-100	

SD – standard deviation

PP – primary progressive, RR – relapsing-remitting, SP – secondary progressive

ADL – activities of daily living, PWB – psychological well-being, SPT – symptoms, RFr – relationships with friends, RFa – family relationships, RHCS – satisfaction with health care system, SSL – sentimental and sexual life, COP – coping, REJ – rejection, NS – non-significant

## Reliability

### *Analysis of frequency distribution*

Normal distribution was noted in total MusiQoL scores, and its PWB and SPT dimensions. The distribution of scores in other dimensions and in particular items was skewed. This was similar to the results obtained by the authors of the original version of the scale [1].

A significant correlation (Pearson R,  $p < 0.01$ ) was found between total MusiQoL score and scores in particular dimensions.

### *Internal consistency of MusiQoL*

Cronbach's alpha coefficient for MusiQoL ranged between 0.67 and 0.90 (ADL: 0.90, PWB: 0.86, RFr: 0.82, SPT: 0.76, RFa: 0.86, RHCS: 0.85, SSL: 0.67, COP: 0.77, and REJ: 0.89). Internal consistency of the MusiQoL scale is therefore satisfactory, except for the SSL dimension.

## Validity analysis

### *Convergent validity of MusiQoL*

Total scores in MusiQoL correlated negatively with EDSS score ( $p < 0.01$ ), and correlated positively with total FAMS score ( $p < 0.01$ ) and with each FAMS subscale ( $p < 0.01$ ) except for FAMS *Family/social well-being* subscale. Total scores in MusiQoL correlated negatively also with MSIS-29 *physical* subscale and MSIS-29 *psychological* subscale ( $p < 0.01$ ). Negative correlations were noted between EDSS and ADL, PWB, SPT, COP, and REJ dimensions. Subscales ADL, PWB, RFr, SPT, RHCS, SSL, COP and REJ correlated (positively in most cases) with total FAMS score and with each FAMS subscale. The same MusiQoL subscales correlated (negatively in most cases) with MSIS-29 *physical* and MSIS-29 *psychological* subscale. SSL subscale showed similar correlations (with the exception of EDSS) and RHCS subscale correlated with similar subscales (with the exception of the Symptoms subscale of FAMS). RFr subscale correlated only with total FAMS and its subscales: *Emotional well-being*, *General contentment*, and *Additional concerns*. RFa subscale correlated only with FAMS subscales: *General contentment*, *Family/social well-being* and *Additional concerns*. The correlations described above are detailed in Table 2. MusiQoL score did not correlate with

duration of the disease or with patients' age. Exceptions were correlations between MusiQoL ADL, SSL and REJ subscales with age as well as between MusiQoL SSL subscale and the duration of the disease.

### *Reproducibility of MusiQoL scale (test-retest analysis)*

Patients' status did not change significantly between two tests – EDSS score did not change. A significant correlation was noted between baseline MusiQoL score and the assessment repeated after 4 weeks (Table 3). No difference was noted between particular items between day 0 and day 28. These results suggest reproducibility of the test.

Mean time required for completion of the questionnaire was  $12.5 \pm 10$  minutes. The percentage of missing data was small, with the exception of the SSL subscale (16%).

## Discussion

This study showed satisfactory results of tested reliability, validity and reproducibility of the Polish version of MusiQoL. This scale correlates with other scales (FAMS and MSIS-29) commonly used to assess physical and emotional status of patients.

Correlations were found between MusiQoL dimensions related to activities of daily living, symptoms and psychological well-being and with the EDSS subscale that describes the degree of patient's disability. It might be inferred that EDSS does not reflect fully the quality of life among patients. It was found, paradoxically, that the duration of the disease has no influence on patients' quality of life. Similar results were obtained during the validation of the international version of MusiQoL [1]; the same finding was reported also in earlier studies on MS [1,3] and schizophrenia [1]. Lack of worsening in terms of quality of life in relation to the duration of disease may be explained by the heterogeneous course of the disease or presence of the benign form of MS that occurs in 15-20% of MS patients in whom the EDSS score is  $< 3$  after at least 15 years of the disease [11].

The higher MusiQoL scores in patients with relapsing-remitting MS suggest their better quality of life while the lower MusiQoL scores in patients with primary or secondary progressive MS point to a worse quality of life due to the more advanced disease.



**Table 2.** Correlations between total MusiQoL score and subscores of each MusiQoL dimension with EDSS, FAMS and MSIS-29 scales and their subscales (*R* – Pearson correlation coefficient)

	MusiQoL total	Musi – ADL	Musi – PWB	Musi – RFI	Musi – SPT	Musi – RFIa	Musi – RHCS	Musi – SSL	Musi – COP	Musi – REJ
EDSS	<i>R</i>	-0.740	-0.296	0.016	-0.161	0.031	0.130	0.112	-0.330	-0.341
	<i>p</i> -value	0.000	0.000	0.850	0.050	0.703	0.112	0.172	0.000	0.000
FAMS total	<i>R</i>	0.684	0.610	-0.228	0.513	-0.138	-0.343	-0.334	0.500	0.542
	<i>p</i> -value	0.000	0.000	0.005	0.000	0.092	0.000	0.000	0.000	0.000
FAMS – M	<i>R</i>	0.473	0.488	-0.099	0.345	-0.029	-0.205	-0.247	0.417	0.468
	<i>p</i> -value	0.000	0.000	0.227	0.000	0.729	0.012	0.002	0.000	0.000
FAMS – S	<i>R</i>	0.410	0.376	-0.056	0.430	0.051	-0.109	-0.144	0.344	0.324
	<i>p</i> -value	0.000	0.000	0.498	0.000	0.536	0.186	0.079	0.000	0.000
FAMS – EWB	<i>R</i>	0.409	0.631	-0.253	0.390	-0.120	-0.342	-0.306	0.522	0.558
	<i>p</i> -value	0.000	0.000	0.002	0.000	0.143	0.000	0.000	0.000	0.000
FAMS – GC	<i>R</i>	0.300	0.512	-0.293	0.361	-0.200	-0.405	-0.292	0.450	0.503
	<i>p</i> -value	0.000	0.000	0.000	0.000	0.014	0.000	0.000	0.000	0.000
FAMS – TF	<i>R</i>	0.478	0.548	-0.034	0.605	0.018	-0.230	-0.258	0.357	0.395
	<i>p</i> -value	0.000	0.000	0.676	0.000	0.831	0.005	0.001	0.000	0.000
FAMS – FSWB	<i>R</i>	0.010	0.309	-0.443	0.266	-0.481	-0.377	-0.367	0.289	0.329
	<i>p</i> -value	0.902	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
FAMS – AC	<i>R</i>	0.306	0.478	-0.168	0.422	-0.173	-0.286	-0.348	0.426	0.389
	<i>p</i> -value	0.000	0.000	0.039	0.000	0.034	0.000	0.000	0.000	0.000
MSIS-29 physical	<i>R</i>	-0.528	-0.804	0.056	-0.343	-0.023	0.175	0.176	-0.422	-0.464
	<i>p</i> -value	0.000	0.000	0.493	0.000	0.782	0.032	0.032	0.000	0.000
MSIS-29 psychological	<i>R</i>	-0.496	-0.589	0.128	-0.578	0.081	0.265	0.336	-0.484	-0.494
	<i>p</i> -value	0.000	0.000	0.119	0.000	0.322	0.001	0.000	0.000	0.000

*MusiQoL* – Multiple Sclerosis International Quality of Life Questionnaire, *ADL* – activities of daily living, *PWB* – psychological well-being, *SPT* – symptoms, *RFI* – relationships with friends, *RFIa* – family relationships, *RHCS* – satisfaction with health care system, *SSL* – sentimental and sexual life, *COP* – coping, *REJ* – rejection  
*EDSS* – Expanded Disability Status Scale  
*FAMS* – Functional Assessment of Multiple Sclerosis, *M* – mobility, *S* – symptoms, *EWB* – emotional well-being, *GC* – general contentment, *TF* – thinking and fatigue, *FSWB* – family/social well-being, *AC* – additional concerns  
*MSIS-29* – Multiple Sclerosis Impact Scale 29

**Table 3.** Test-retest analysis for the assessment with MusiQoL on day 0 (MusiQoL) and day 28 (statistics for paired samples;  $p < 0.001$  for all correlations)

		Mean	Standard deviation	Standard error of the mean	Correlation coefficient
Pair 1	MusiQoL – total (day 0)	42.8	13.1	1.1	0.711
	MusiQoL – total (day 28)	44.5	12.8	1.1	
Pair 2	Musi – ADL (day 0)	41.2	28.1	2.4	0.872
	Musi – ADL (day 28)	41.4	30.1	2.6	
Pair 3	Musi – PWB (day 0)	55.7	24.2	2.1	0.646
	Musi – PWB (day 28)	55.9	27.0	2.3	
Pair 4	Musi – RFr (day 0)	31.6	23.5	2.0	0.541
	Musi – RFr (day 28)	35.2	21.8	1.9	
Pair 5	Musi – SPT (day 0)	68.4	23.6	2.1	0.608
	Musi – SPT (day 28)	71.4	21.8	1.9	
Pair 6	Musi – RFa (day 0)	18.9	23.7	2.1	0.547
	Musi – RFa (day 28)	21.8	21.8	1.9	
Pair 7	Musi – RHCS (day 0)	26.0	22.6	2.0	0.564
	Musi – RHCS (day 28)	28.1	21.7	1.9	
Pair 8	Musi – SSL (day 0)	30.7	27.4	2.4	0.634
	Musi – SSL (day 28)	33.6	27.2	2.4	
Pair 9	Musi – COP (day 0)	51.3	30.1	2.6	0.571
	Musi – COP (day 28)	53.1	30.0	2.6	
Pair 10	Musi – REJ (day 0)	61.5	33.4	2.9	0.654
	Musi – REJ (day 28)	60.3	32.5	2.8	

The lower scores of patients living in the country in dimensions related to activities of daily living, symptoms and psychological well-being suggest that their quality of life is worse than in their counterparts living in the town, possibly due to the worse access to specialized health care and to the modern methods of treatment or in association with their more demanding living conditions in general. Higher ADL and SPT subscores in employed patients, as well as in the COP subscore, fulfil the expectations related to the scale.

Patients with a university degree, who scored higher in total MusiQoL and in its ADL, SPT and REJ dimensions have better quality of life related to activities of daily living, cope better with their symptoms and experience less social rejection in comparison with patients with vocational or secondary education.

Validation analysis shows that MusiQoL is useful for the assessment of the impact of the disease on quality of life in MS patients. The obtained correlation coef-

ficients between MusiQoL and related measures suggest a satisfactory convergent validity of the MusiQoL scale. The reproducibility of MusiQoL is another positive feature that proves its reliability. MusiQoL is relatively brief and takes a short time to complete ( $12.5 \pm 10$  minutes). The scale may be used for both clinical and research purposes, as well as a tool for monitoring patients' health status. The prognostic utility of MusiQoL might also be considered.

## Conclusions

1. Validation analysis of MusiQoL showed that the scale is a useful self-reporting tool for the assessment of patients with MS.
2. The relatively small group ( $n = 150$ ) and the limited number of methods chosen for statistical analysis require further studies with larger samples.

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## Disclosure

Authors report no conflict of interest.

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## Appendix

Multiple Sclerosis International Quality of Life Questionnaire (Polish version)  
Międzynarodowy Kwestionariusz Jakości Życia w Stwardnieniu Rozsianym (SR): MusiQoL

Z powodu SR, w czasie ostatnich 4 tygodni, czy Pan/i						
Na każde pytanie, proszę zaznaczyć odpowiedź najbliższą Pani/Pana odczuciom	Nigdy/ Wcale nie	Rzadko/ Trochę	Czasami/ Nieco	Często/ Dużo	Zawsze/ Bardzo dużo	Nie dotyczy
1) miał/a problemy z chodzeniem lub poruszaniem się poza domem?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2) miał/a problemy z zajęciami poza domem, tj. z zakupami, wyjściem do kina itp.?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3) miał/a problemy z chodzeniem lub poruszaniem się po domu?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4) miał/a problemy z równowagą lub chodzeniem?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5) miał/a problemy z pracą w domu w czasie wolnym, tj. majsterkowaniem, uprawianiem ogrodu itp.?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6) miał/a problemy z pracą zawodową, tj. z integracją (ze współpracownikami), współpracą z innymi (z powodu swojej choroby), ograniczeniami (spowodowanymi chorobą)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7) szybko się męczył/a?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8) nie miał/a energii?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9) czuł/a się zaniepokojona/y?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10) czuł/a się w depresji lub przygnębiona/y?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11) Pani/Panu chciało się płakać?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12) czuł/a się zdenerwowana/y lub poirytowana/y przez niektóre rzeczy lub sytuacje?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13) miał/a problemy z powodu utraty pamięci?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14) miał/a kłopoty z koncentracją, tj. podczas czytania, oglądania filmu, w podążaniu za dyskusją?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15) miał/a problemy z powodu pogorszenia wzroku lub innych zaburzeń widzenia?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16) doświadczał/a nieprzyjemnych uczuć, tj. gorąca, zimna...?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17) rozmawiał/a ze swoimi przyjaciółmi?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18) czuł/a się rozumiana/y przez przyjaciół?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19) czuł/a się wspierana/y przez przyjaciół?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20) rozmawiał/a z małżonkiem/partnerem lub rodziną?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21) czuł/a się rozumiana przez małżonka/partnera lub rodzinę?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22) czuł/a się wspierana/y przez swojego małżonka/partnera lub swoją rodzinę?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23) czuł/a się usatysfakcjonowana/y swoim życiem uczuciowym?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24) czuł/a się usatysfakcjonowana/y swoim życiem erotycznym?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25) czuł/a, że Pani/Pana sytuacja jest niesprawiedliwa?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26) czuł/a się rozgoryczona/y?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

27) był/a zdenerwowana/y z powodu spojrzeń innych ludzi?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28) był/a zakłopotana/y publicznie?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29) był/a usatysfakcjonowana/y informacjami dotyczącymi Pani/Pana choroby lub jej leczenia udzielanymi przez lekarzy, pielęgniarki, psychologów itp. zajmujących się Pani/Pana SR?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30) czuł/a się Pan/i rozumiana/y przez lekarzy, pielęgniarki, psychologów itp. zajmujących się Pani/Pana SR?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31) był/a usatysfakcjonowana/y swoim leczeniem?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>