

Validation of the Polish version of the Assessment of Quality of Life questionnaire (AQoL-6D) in the elderly population

Walidacja polskiej wersji kwestionariusza Assessment of Quality of Life (AQoL-6D) w populacji osób starszych

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Keywords

quality of life, health, seniors, dementia, physical culture

Abstract

Introduction: The Assessment of Quality of Life 6-Dimension (AQoL-6D) is a questionnaire that was developed to examine the quality of life related to health.

Aims: The aim of the study was to translate, cultivate and validate the Polish language version of the AQoL-6D questionnaire.

Material and methods: The study was conducted among a group of 103 subjects above the age of 65 who agreed to take part in the trial. The group included 50 seniors with mild to moderate dementia and 53 seniors without dementia. The snow-ball method was used for the selection of the sample. All respondents lived in the following voivodeships: Podkarpackie and Śląskie. The participants completed the paper version of the AQoL-6D questionnaire once. The research was carried out in September 2019.

Results: Alpha Cronbach's reliability coefficients (α) in the Polish language version was $\alpha = 0.98$, which means that a very high level of internal compliance was noted. Such a high value of the coefficient, as well as very high values of discriminatory power (i.e. the correlation of the item with the overall result), indicate that these items are almost identical to the overall result. The assessment of relevance in the area of factor structure was ambiguous.

Conclusions: The proposed Polish language version of the Assessment of Quality of Life 6-Dimension (AQoL-6D) questionnaire performs the function of assessing quality of life-related to health. It must be indicated that the overall test result is analysed. The use of subscales is unfounded, as demonstrated by statistical analyses.

Słowa kluczowe

jakość życia, zdrowie, seniorzy, demencja, kultura fizyczna

Streszczenie

Wprowadzenie: The Assessment of Quality of Life 6-Dimension (AQoL-6D) to kwestionariusz który został opracowany do badania jakości życia związanej ze zdrowiem.

Cele: Celem badania było przetłumaczenie, adaptacja kulturowa i walidacja polskiej wersji językowej kwestionariusza AQoL-6D.

Material i Metody: Badanie przeprowadzono w grupie 103 osób powyżej 65 roku życia, które zgodziły się wziąć udział w badaniu. Grupa obejmowała 50 seniorów z demencją w stopniu łagodnym i umiarkowanym oraz 53 seniorów bez demencji. W doborze próby zastosowano metodę kuli śnieżnej. Wszyscy badani zamieszkiwali na terenie województw: podkarpackiego i śląskiego. Respondenci wypełniali papierową wersję kwestionariusza AQoL-6D jednokrotnie. Badania zrealizowano we wrześniu 2019 roku.

Wyniki: Współczynniki rzetelności Alfa Cronbacha (α) dla polskiej wersji językowej wynosił $\alpha = 0,98$, co oznacza, że odnotowano bardzo wysoki poziom zgodności wewnętrznej. Tak wysoka wartość współczynnika a także bardzo wysokie wartości mocy dyskryminacyjnej (tj. korelacji itemu z wynikiem ogólnym) wskazują na fakt, że itemy te są niemal tożsame z wynikiem ogólnym. Ocena trafności w sferze struktury czynnikowej była niejednoznaczna.

Wnioski: Zaproponowana polska wersja językowa kwestionariusza The Assessment of Quality of Life 6-Dimension (AQoL-6D) spełnia funkcję oceny jakości życia związanej ze zdrowiem. Z zaznaczeniem, że analizie poddaje się ogólny wynik testu. Stosowanie podskal jest niezasadne na co wskazują przeprowadzone analizy statystyczne.

The individual division of this paper was as follows: a – research work project; B – data collection; C – statistical analysis; D – data interpretation; E – manuscript compilation; F – publication search

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INTRODUCTION

The subject of quality of life is undertaken in various fields, including medicine, rehabilitation, psychology or sociology, hence the multitude of ways of its definition. The World Health Organization (WHO) captures quality of life as an individual perception of one's own life position, taking cultural conditions, the value system in connection with personal goals, expectations, norms and problems into account. Factors affecting quality of life are: physical health, relationships with other people and important environmental features for a given person¹.

The study of the quality of life is possible thanks to the use of appropriate research tools, which are usually questionnaires. As Barbara Cieślik and Halina Podbielska² prove in their research, the most commonly used tool in medicine is the Medical Outcomes Study 36-item Short Form Health Survey - the name adopted in Poland is the SF-36 questionnaire. This questionnaire is intended for those healthy or ill, and contains questions about several areas of functioning, ranging from general health, onto physical activity, to the feeling of pain and mental well-being. However, it does not pay attention to any problems related to the impairment of sensory organs and communication, which seem to significantly reduce quality of life among seniors. Another tool used in medical sciences, including the field of physical culture sciences, is the World Health Organization Quality of Life (WHOQOL) questionnaire, in the short version (bref) and concerning the elderly (age). This scale determines the level of quality of life based on answers regarding life satisfaction. However, this scale may not be sufficient in determining the impact of physical fitness on quality of life.

As emphasized by Puciato et al., correlating the WHOQOL with the International Physical Activity Questionnaire (IPAQ), there should be more references in the quality of life scales regarding physical activity and the manner of performing daily activities. However, among the reports

on the tools used in Poland, there is no information on the Assessment of Quality of Life 6-Dimension (AQoL-6D) questionnaire that would enrich the mentioned instruments. The AQoL-6D is a tool that makes it possible to conduct multidimensional assessment of the health-related quality of life of its respondents³. This is 1 of 4 tools created for the purpose of assessing quality of life, which is distinguished by focusing on the examination of specific dimensions related to health⁴. The authors of the version described in this article are members of a team led by Professor Jeff Richardson from Monash University (Australia). This questionnaire comprehensively approaches the issue of quality of life (considering seniors and those whose quality of life experiences a decrease due to the occurrence of disease symptoms), based not only on the assessment of life satisfaction in various areas of daily functioning, but also allowing for precise determination of difficulties in performing specific activities and those related to particular life situations. This is especially important in determining quality of life from the perspective of physical culture sciences, including a comprehensive approach to rehabilitation (occupational and physical therapy). The questionnaire also includes questions about well-being, pain affecting activity, the functioning of the senses or a sense of control and self-solving problems. In this way, 2 levels are connected: physical and cognitive, which are necessary for efficient functioning, which translates into a high quality of life, including among those elderly. In addition, the impact of health on family and social contacts, as well as communication involving both speaking and understanding others, are included. The AQoL-6D questionnaire contains 20 items. Individual items are grouped into 6 subscales: physical abilities (doing housework, mobility, walking, self-care), social and family relationships (friends, family, community), mental health (despair, worry, sadness, anxiety), coping (energy, control, dealing), pain (frequency of pain, degree of pain sensation, im-

pact of pain on everyday activities), senses (seeing, hearing, communicating)⁵. Example items: (1) How much help do you need to deal with household chores (e.g. preparing meals, cleaning, gardening)?; (8) How often have you felt distraught in the last 7 days?; (14) To what extent can you deal with the problems in your life? The suggested time required to fill out the AQoL-6D is 2-3 minutes.

The queries in the questionnaire refer to the health state of the subject from the perspective of 1 week preceding evaluation. When the respondent is not able to provide the answer himself/herself, it is necessary to resort to the assistance of a guardian - a person who knows the given person's situation and is able to represent it. This tool, in the Polish reality, can facilitate the assessment of changes in the quality of life that may occur as a result of the use of comprehensive rehabilitation, including occupational therapy. Especially since most of the subscales can be referred to categories typical for the field of occupational therapy, i.e. functionality, resilience, communication or finding oneself in a family and social environment. Moreover, the questions contained in the AQoL-6D are consistent with the problems of aging and the first signs of dementia, which allow their correlation with decrease in quality of life.

STUDY AIM

To date, no publications on the validation of the Polish language version of the Assessment of Quality of Life 6-Dimension (AQoL-6D) have been found, therefore, the aim of the work was to develop and verify a Polish translation of this tool. This questionnaire will also be used as one of the tools during the implementation of the international research project - HOMESIDE - music and reading intervention used by home caregivers of people with dementia (home-based family caregiver-delivered interventions for people living with dementia: an international randomised

controlled trial). This research will be carried out in 5 countries, i.e. Australia, Great Britain, Germany, Norway and Poland.

MATERIALS AND METHODS

Prior to beginning the study, consent from the questionnaire's creators was obtained for its validation in the Polish language. The validation was planned and carried out in accordance with ISPOR guidelines (translation and cultural adaptation of research tools)⁶. Preparation of the Polish version of AQoL-6D began with the preparation of 2 independent translations from the original English version of the scale. Both translations were used to design another Polish version of the questionnaire, which after stylistic and language corrections, was translated into English (so-called back-translation). This translation was compared with the original version of the questionnaire by a team of experts who did not find significant differences between the original version and the translation. However, it was noted that some of the options for answering individual items may be difficult to read for Polish recipients, especially that seniors, including those with dementia, were to be the research sample. Therefore, it was decided to conduct a pilot study among 10 seniors, including 4 with dementia, which aimed to test the ability to determine differences between individual responses. In this trial, it was shown that these differences were not clear. Therefore, it was decided to make corrections to items that caused doubt. For example, in item 13, the translation: always / mostly / sometimes / only sporadically / never, was replaced with the phrases: always/often/neither often nor rarely/rarely/never. Similar changes were provided in items 8, 9, 10, 17. The questionnaire prepared in this way was qualified for further research.

The study included 103 subjects above the age of 65 ($n=103$), of which 50 were seniors with dementia (SWD), while 53 comprised seniors without dementia (SWOD). Among

the respondents, 63.11% were women and 36.89% were men. The sample was selected using the snowball method. The respondents lived in the Podkarpackie and Śląskie voivodeships. The age of all respondents ranged from 65 to 90 years. The average age of seniors with dementia was 76 years ($SD=1.53$), seniors without dementia - 72 years ($SD=1.38$). Those with dementia presented mild to moderate levels of this disorder.

The examination was granted consent No. 186/OIL/2019, issued on 17 Sep. 2019 by the Bioethical Commission operating at the Regional Medical Chamber in Kraków.

After obtaining the results, the data were examined and subjected to statistical analysis using the AMOS SPSS v. 23 and the Jamovi statistical package^{7,8,9}.

RESULTS

Relevance in the area of factorial structure

Relevance in the area of factorial structure of the validated tool was tested using confirmatory factor analysis (CFA) via maximum likelihood estimation methods in the AMOS SPSS v. 23 and Jamovi programs. The following were calculated: χ^2 , RMSEA (Root Mean Square Error of Approximation) and SRMR (Standardised Root Mean Square Residual) as well as NFI (Normed Fit Index), TLI (Tucker Lewis Index) and CFI (Comparative Fit Index). It was decided to resign from presenting GFI and AGFI indices due to the large impact of the group size on them - they are not currently not indicated in CFA¹⁰. The classic threshold of $p=0.05$ was considered the level of significance.

First, the χ^2 index was calculated. It was highly significant, which is a sign of a mismatch between the model and the data; $\chi^2(155) = 474.66$; $p<0.001$. This test is optimal for a database between 75 and 200 measurements, and there were 103 records in the analysed database. Subsequent indices provided ambiguous indications. The RMSEA level = 0.142, 90% CI [0.128; 0.157] indi-

cate a poor match between the variables and the tested model. It is assumed that a value of the RMSEA index above 0.08 or - when applying a more liberal approach - 0.1, indicates a poor fit of the model¹⁰, and the values obtained in the study are much higher. Moreover, even the 90% confidence interval is not even close to the mentioned threshold value. A similar interpretation should be adopted for NFI = 0.847 and TLI = 0.886. The cut-off point for a good fit should be assumed for these indicators as 0.95. The TLI is indicated as being suitable for relatively small research groups, as opposed to the CFI (revised NFI), which is not sensitive to group size. In this analysis, the CFI - 0.891 index is only slightly below the cut-off point of 0.9. The only index that indicates a good fit of the model is SRMR = 0.053. An SRMR value below 0.08 means a good fit of the model (Hu & Bentler, 1999). However, this probably results from the very strong correlation of factors with each other (Figure 1).

A cursory interpretation of this figure indicates that the individual factors are overly correlated. It is enough to indicate that the weakest correlation was observed between the IL and MH scales, the correlational value being $r=0.76$. This analysis is confirmed by exploratory factor analysis. In the screen plot, shown below as Figure 2, the existence of one main factor is clearly indicated.

The existence of one main factor is also confirmed by the non-rotated matrix of components, where the first factor explains 73.21% of the variance and the second only 6.15% (while it meets the criterion of eigenvalue > 1, assuming a value of 1.23). Factor load values for one main factor are good for all items (Table 1). Attempts to create a two-factor variant with rotation did not provide a satisfactory result.

Analysis of reliability

The reliability of the questionnaire is, in other words, the accuracy with which it measures. The level of internal compliance of the Polish version

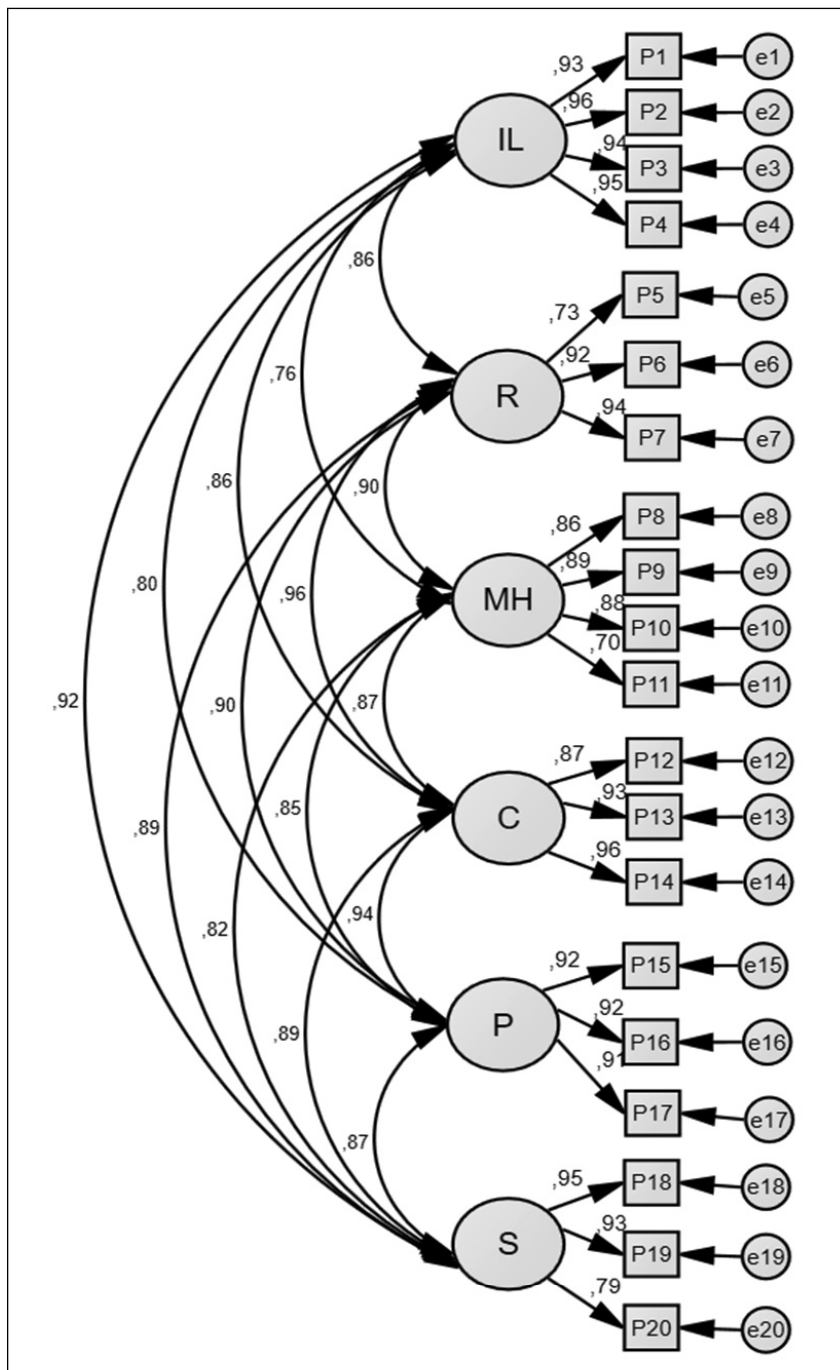


Figure 1
CFA results

of the AQoL-6D was verified using Cronbach’s α . The measurement of the questionnaire’s reliability are alpha coefficient values >0.7011 . Descriptive statistics for all items and the values of discriminatory power are presented in Table 1.

The data presented in Table 2 show that a very high level of internal compliance was recorded, $\alpha=0.98$. Such a high value of the coefficient, as well as very high values of discriminatory

power (i.e. the correlation of the item with the overall score), indicate that these items are almost identical to the general result.

Comparative analysis

First, the results obtained in the group of seniors with and without dementia were compared. The Student’s *t*-test was carried out for in-

dependent trials. As it can be seen in Table 3, a statistically significant result was recorded. Higher results, indicating worse functioning, were noted in the group of seniors with dementia. The power of the indicated effect, measured by Cohen’s *d* ratio, was moderately high.

Next, it was checked whether the gender of seniors caused differentiation in the level of functioning. Analyses were performed separately in the group of seniors with and without dementia. As can be seen in Table 4, a statistically significant result was recorded only in the group of subjects without dementia. Higher results, indicating worse functioning, were noted in the group of women. The effect strength was moderately high. In the group of people with dementia, there were no differences, even at the level of statistical tendency.

In the final stage, it was checked whether age correlates with the level of seniors’ functioning. Spearman’s rank correlation analyses were performed separately for the group of seniors with and without dementia. Statistically significant results were noted in both groups, with a moderately strong correlation in the group of people with dementia, $\rho=0.495$; $p<0.001$; while in the group of seniors without dementia, this correlation was very strong, $\rho=0.773$; $p<0.001$.

DISCUSSION

The research carried out using the AQoL-6D questionnaire concerned various groups, including both healthy and ill subjects. It should be noted that so far, such research has only been undertaken in Australia - the study included, among others: adolescents¹², cancer patients and their caregivers¹³, patients with peripheral neuropathy¹⁴. The AQoL-6D questionnaire was also used among seniors in studies on the risk of falls among seniors¹⁵.

Among the available studies on the AQoL-6D questionnaire, it is necessary to quote the text by Richardson and team¹⁶ on the design of AQoL-6D and assessment of its usefulness.

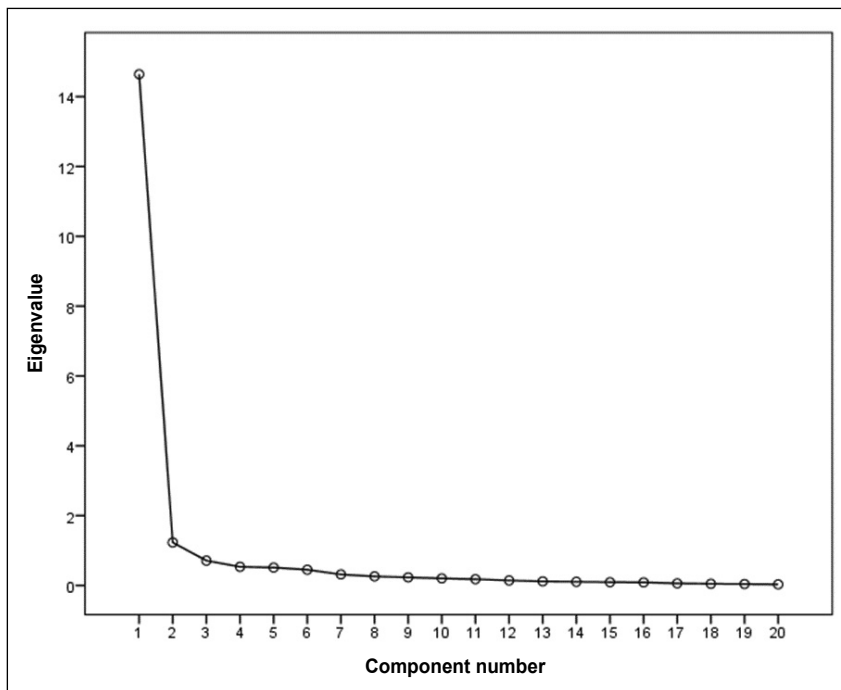


Figure 2
Screen plot

The research was carried out in Australia on a sample of 620 people. As a result of the research process, the authors proposed a structure of the model that is grounded in the analysis of Structural Equation Modeling (SEM). This structure includes the previously described tool consisting of 20 items and 6 subscales. To the best of the authors' knowledge, there is no other questionnaire available in the Polish language that could be a reference point for AQoL-6D. The results obtained in the authors' research are different from those presented in the cited article. This means that the AQoL-6D may be particularly useful when it comes to the overall result of the questionnaire - no significant differences were observed here. The high internal compatibility of the questionnaire allows for determining and comparing changes in quality of life as a phenomenon affected by a whole range of varying factors. However, as a result of analysing data obtained in Poland, the use of subscales is not justified. The reason for this may be too idealistic assumptions of the questionnaire creators. Despite this, considering the responses of the subjects included in the subscales may be of clinical significance, e.g. in the process of comprehensive, individual

rehabilitation, so as to record changes occurring in a given person.

Due to the rather unusual nature of the questionnaire and the large similarity of the response 'cafeteria' in in-

Table 1

Factor loadings for the one-scale version of the questionnaire	
Items	Main factor
P14	0.92
P7	0.92
P18	0.90
P3	0.90
P13	0.89
P6	0.89
P17	0.89
P4	0.88
P12	0.88
P15	0.87
P19	0.87
P2	0.86
P16	0.85
P1	0.85
P10	0.83
P20	0.82
P9	0.82
P8	0.81
P5	0.77
P11	0.66

Table 2

Descriptive statistics and discriminatory power of selected items			
Items	\bar{x}	SD	Discriminatory power
P1	3.12	1.15	0.84
P2	3.49	1.58	0.86
P3	3.24	1.49	0.89
P4	3.10	1.16	0.88
P5	2.67	0.90	0.74
P6	2.11	0.90	0.87
P7	2.28	1.01	0.90
P8	2.37	1.27	0.78
P9	2.82	1.05	0.80
P10	2.89	1.01	0.80
P11	2.96	0.80	0.62
P12	3.31	0.99	0.86
P13	2.75	1.06	0.87
P14	2.89	1.07	0.91
P15	2.61	0.97	0.85
P16	2.51	0.91	0.83
P17	3.05	1.17	0.87
P18	3.20	1.16	0.90
P19	3.10	1.20	0.85
P20	2.22	1.04	0.80

\bar{x} – mean, SD – standard deviation

Table 3

Level of functioning depending on whether the senior had dementia									
	SWD (n = 50)		SWOD (n = 53)		T	p	95% CI		Cohen's d
	\bar{x}	SD	\bar{x}	SD			LL	UL	
General level of functioning	62.96	18.47	50.75	17.21	3.47	0.001	5.23	19.18	0.68

\bar{x} – mean; SD – standard deviation; t – Student's t-test result; p – statistical significance; CI – confidence interval; LL – lower limit; UL – upper limit; SWD – seniors with dementia; SWOD – seniors without dementia

Table 4

Level of functioning according to seniors' gender									
	Females		Males		T	p	95% CI		Cohen's d
	\bar{x}	SD	\bar{x}	SD			LL	UL	
SWD	62.09	16.85	65.00	22.34	-0.51	0.614	-14.47	8.64	0.16
SWOD	55.87	17.12	44.09	15.21	2.60	0.012	2.70	20.86	0.72

\bar{x} – mean; SD – standard deviation; t – Student's t-test result; p – statistical significance; CI – confidence interval; LL – lower limit; UL – upper limit; SWD – seniors with dementia; SWOD – seniors without dementia

dividual questions, an accurate translation into Polish would significantly reduce its readability. In addition, the authors of the validation, considering that the research sample comprised seniors, including seniors with dementia, made alterations to the translation regarding some items, based on the pilot study. As a result, the potential problem of incomplete understanding of some response options by the subjects was solved.

The AQoL-6D questionnaire has a chance to prove itself in Polish reality among the elderly population, covering the broadly understood approach to physical culture sciences, including comprehensive rehabilitation represented by occupational and physical therapy. It can significantly facilitate determining the quality of life, or its changes, in the senior population and among those with symptoms called dementia changes.

CONCLUSIONS

The proposed Polish-language version of the Assessment of Quality of Life 6-Dimension (AQoL-6D) questionnaire allows for overall assessment of quality of life related to health or broadly understood physical culture. However, there is no statistical justification for the separate use of subscales distinguished

by the authors of the questionnaire.

Thanks to validation, it will be possible to use the questionnaire in the Polish language version among the population of people undergoing comprehensive rehabilitation (including occupational or physical therapy), so that through changes in physical and cognitive areas, it becomes possible to determine the effects of therapy on their quality of life.

References

- Kukielczak A. Rozwój zainteresowania w naukach medycznych badaniami nad jakością życia. *Przeł Epidemiol* 2012; 66 (3): 540-541.
- Cieślak B., Podbielska H. Przegląd wybranych kwestionariuszy oceny jakości życia. *Acta Biooptica Inf Med* 2015; 21(2): 102-135.
- Allen J., Inder K.J., Lewin T.J., Attia J.R., Kelly B.J. Construct validity of the Assessment of Quality of Life - 6D (AQoL-6D) in community samples. *Health Qual Life Outcomes* 2013; 11: 61.
- Richardson J., Day N.A., Peacock S., Iezzi A. Measurement of the quality of life for economic evaluation and the Assessment of Quality of Life (AQoL) Mark 2 Instrument. *Aust Econ Rev* 2004; 37(1): 62-88.
- Hawthorne G., Richardson J., Osborne R. The Assessment of Quality of Life (AQoL) instrument: a psychometric measure of health-related quality of life. *Qual Life Res* 1999; 8: 209-224.
- Wild D., Grove A., Martin M., Eremenco S., McElroy S., Verjee-Lorenz A., i wsp. Principles of Good Practice for the Translation and Cultural Adaptation Process for Patient-Reported Outcomes (PRO) Measures: Report of the ISPOR Task Force for Translation and Cultural Adaptation. *Value Health* 2005; 8(2): 94-104.
- Hu L., Bentler P.M. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct Equ Modeling* 1999; 6: 1-55.
- MacCallum R.C., Browne M.W., Sugawara H.M. Power analysis and determination of sample size for covariance structure modeling. *Psychol Methods* 1996; 1: 130-149.
- Sharma S., Mukherjee S., Kumar A., Dillon W.R. A simulation study to investigate the use of cutoff values for assessing model fit in covariance structure models. *J Bus Res* 2005; 58: 935-943.
- MacCallum R.C., Browne M.W., Sugawara H.M. Power analysis and determination of sample size for covariance structure modeling. *Psychol Methods* 1996; 1: 130-149.
- Freeman C., Tyrer P. Research methods in psychiatry. A beginner's guide. Tavistock: Gaskell 1995.
- Keating C.L., Moodie M.L., Richardson J., Boyd A.S. Utility-Based Quality of Life of Overweight and Obese Adolescents. *Value Health* 2011; 14(5): 752-758.
- Chambers S.K., Giris A., Occhipinti S., Hutchison S., Turner J., Carter R., i wsp. Beating the blues after Cancer: Randomised controlled trial of a tele-based psychological intervention for high distress patients and carers. *BMC Cancer* 2009; 9.
- Duke J., McEvoy M., Sibbritt D., Guest M., Smith W., Attia J. Vibrotactile threshold measurement for detecting peripheral neuropathy: Defining variability and a normal range for clinical and research use. *Diabetologia* 2007; 50(11): 2305-2312.
- Delbaere K., Close J.C.T., Heim J., Sachdev P.S., Brodaty H., Slavin M.J., i wsp. A Multifactorial Approach to Understanding Fall Risk in Older People. *J Am Geriatr Soc* 2010; 58(9): 1679-1685.
- Richardson J.R., Peacock S.J., Hawthorne G., Iezzi A., Elsworth G., Day N.A. Construction of the descriptive system for the assessment of quality of life AQoL-6D utility instrument. *Health Qual Life Outcomes* 2012; 10, 38.

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