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ORIGINAL PAPER

Agnieszka Bejer [1,2] (ABCDFGH), Sabina Mastej [3] (DFG), Elżbieta Domka-Jopek [1] (BCD), Mirosław Probachta [2] (BCD), Marek Kulczyk [2] (CD), Sharon Griffin [4] (AD)

Polish linguistic adaptation of the Western Ontario Shoulder Instability Index

[1] Institute of Physiotherapy, Faculty of Medicine, University of Rzeszów, Rzeszów, Poland
[2] The Holy Family Specialist Hospital, Rudna Mała, Poland
[3] Department of Rehabilitation, Health Centre Dr Mastej, Jasło, Poland
[4] Fowler Kennedy Sport Medicine Clinic, University of Western Ontario, London, Ontario, Canada

ABSTRACT

Introduction. The Western Ontario Shoulder Instability Index (WOSI) is a patient reported outcome measure to assess the impact of unstable shoulder on various spheres of a patient's life. The aim of this paper is to present the stages of linguistic adaptation of the English version of the WOSI questionnaire into the Polish version (WOSI-PL).

Material and methods. The research used the procedure of translation of research tools recommended by Mapi Research Institute, which allows to minimize errors resulting from the translation.

Results. Two versions of the translation were created: A1V and A2V, and based on them, a common version BV was agreed. An English native speaker made a back translation version – BTV. Next, the BTV was compared with the source version SV, corrections were made and the CV version was created. Based on the analysis of experts' assessments, a DV version was agreed, then evaluated by a group of 6 patients. The patients' responses was analyzed, and the final version – WOSI-PL was created.

Conclusion. The WOSI-PL constitutes a valuable tool to evaluate health-related quality of life in patients with shoulder instability. The questionnaire before being introduced to scientific research and clinical practice will be subjected to a validation process in order to evaluate psychometric properties.

Keywords. questionnaire, quality of life, shoulder instability, WOSI

The list of abbreviations:

A1V – A1 version of Western Ontario Shoulder Instability Index, A2V – A2 version of Western Ontario Shoulder Instability Index, ASES – American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form, BTV – Back translation version of Western Ontario Shoulder Instability Index, BV – B version of Western Ontario Shoulder Instability Index, DV – D version of Western Ontario Shoulder Instability Index, DASH – Disability of the Arm, Shoulder, and Hand questionnaire, MISS – Melbourne Instability Shoulder Scale, No – Number, OISS – Oxford Instability Shoulder Score,

Corresponding author: Agnieszka Bejer, e-mail: agnbej@wp.pl

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SF-12 – 12-Item Short Form Health Survey, SV – Source version of Western Ontario Shoulder Instability Index, UCLA – University of California Los Angeles *Shoulder Rating scale*, WORC – Western Ontario Rotator Cuff Index, WOSI – Western Ontario Shoulder Instability Index, WOSI-PL – Western Ontario Shoulder Instability Index - Polish version

Introduction

The instability of the shoulder joint is a relatively common complaint, especially among young and physically active patients.[1,2] This term refers to the inability to keep the head of the humerus in the acetabulum of the joint caused by the lack of integrity of both static and dynamic structures that secure the joint. Dislocation may occur as a result of atraumatic instability e.g. as a result of frequently repeated movements causing soft tissue micro-injuries or congenital malformations.[3,4] More often, however, so-called traumatic instability occurs as a result of injuries in contact sports and those in which throw movement are made. Among the various types of post-traumatic instability, anterior dislocation is most frequently observed, which is noted in more than 90% of cases.[5,6] The main symptoms of dislocation are pain, the sensation of popping and clicking in the joint, limitation of physical activity and general decline in quality of life.[7-9]

For a long time, a number of tests have been available differentiating shoulder articular instability and various methods of conservative and surgical treatment. Also measures and tools are increasingly used for subjective assessment of the functional status and quality of life in patients such as Disability of the Arm, Shoulder, and Hand (DASH) questionnaire, Oxford Instability Shoulder Score (OISS), Melbourne Instability Shoulder Scale (MISS) and the Western Ontario Shoulder Instability Index (WOSI).[10-13]

The Western Ontario Shoulder Instability Index (WOSI) was developed by Kirkley A. et al. in 1998. The process of creating WOSI included several stages. Questionnaire questions were created based on a thematic review of the literature, interviews with patients with shoulder instability and health care professionals involved in such patients. Then, the number of items was reduced using patient-generated frequency-importance products and correlation matrices. In the final stage, WOSI was tested by 2 groups of patients of 10 people each. Finally, a questionnaire consisting of 21 questions grouped into four domains was developed. The authors also assessed the psychometric properties of the new tool (validity, reliability and responsiveness). Validation analysis showed that the reliability of WOSI was very high at 2 weeks and 3 months (the intra-class correlation coefficients for the total WOSI score were 0.949 and 0.911, respectively). It was also more responsive (sensitive to change; standardized response mean was 0.931) than five other shoulder measurement tools - the Disabilities of the Arm, Shoulder and Hand scale (DASH); the American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form (ASES); the University of California Los Angeles *Shoulder Rating scale* (UCLA); the Constant Score; and the Rowe Rating Scale and then a global health instrument – the 12-Item Short Form Health Survey (SF-12) and range of motion.[13] Rouleau DM et al. in a publication that was a systematic review of patient-administered shoulder functional instability showed that out of the 25 questionnaires used in the literature to assess shoulder instability, WOSI appears to exhibit the best psychometric properties for this population.[14]

The selection of an appropriate tool for subjective assessment of the patient in conjunction with an objective assessment of specialists allows to monitor the course of treatment and rehabilitation, and this contributes to the quality of life of the patient.[10] However, for reliable results, standardized research tools must be used.[13,14]

The WOSI questionnaire was translated into German, Dutch, Italian, Japanese, Portuguese used in Brazil, Swedish, Turkish and French.[15-22] We undertook this research due to the lack of research tools in Poland to assess the quality of life of people with shoulder instability or operated for that reason, which would cover different areas of the subjects' lives.

Aim

The aim of this study was to cross-culturally adapt the English version of the WOSI for use in the Polish patients with shoulder instability or operated for shoulder instability.

Material and methods

1. The description of the WOSI questionnaire

The WOSI questionnaire is a specific, self-reported research tool for assessing the quality of life in patients with shoulder instability – in the source version it was developed in English. The questionnaire contains 21 questions divided into four sections. Section A deals with physical symptoms and contains 10 questions, section B contains 4 questions and refers to sport, recreation and work, section C also contains 4 questions and concerns lifestyle and the last section D contains 3 questions and concerns emotions. The WOSI score contains extensive written instruction for users, which includes a clarification of every single question.[13]

2. The assessment of the level of quality of life and functional state of patients with shoulder instability on the basis of WOSI questionnaire

The format of the response to the questionnaire is a 10-cm analogue visual scale on which the respondents put a slash '/'. The score is calculated by measuring the dis-

tance from the left of the scale to the nearest 0.5 mm and converting the result to 100. In this way, the final result of 2100 can be calculated by summing the results from individual sections (Physical symptoms / 1000; Sport / Recreation / Work / 400; Lifestyle / 400; Emotions / 300). The best possible score is 0, which signifies that the patient has no decrease in shoulder-related quality of life. The worst score possible is 2,100. This signifies that the patient has an extreme decrease in shoulder-related quality of life. The score can also be presented as percentage with 100% (0 points) being the best score and 0% (2100 points) being the lowest score. To obtain the final percentage, the total result should be subtracted from 2100 and then divided by 2100 and multiplied by 100. To calculate the percentage for individual sections, the same pattern must be followed.[13]

3. Translation methods and language adaptation applied to the Polish version of WOSI questionnaire

The approval was obtained from the copyright owner – Sharon Griffin – to create a Polish version of the WOSI questionnaire.

The adaptation process of WOSI was taken in accordance with the guidelines of the Mapi Research Institute and including 6 stages:[23]

1. "Forward" translation by two independent translators → forward version AV1 and forward version AV2
2. Reconciliation meeting between the two "forward" translators and the local team → forward version BV
3. "Backward" translation by an independent translator → backward translation BTV
4. Comparison of the source questionnaire with the "backward" translation by the local team, "backward" translator and author → forward version CV
5. Review by clinicians working in the relevant medical field → forward version DV
6. Cognitive debriefing - test of the clarity, understandability and acceptability of forward DV on 6 person with shoulder instability and who are native speakers of the target language → final version – WOSI-PL.

Results

The Polish linguistic adaptation of the WOSI was made in six stages:

Stage I

At this stage of adaptation, translation was used, which is characterized by a high level of translation reliability, but allows the introduction of Polish language equivalents in case of expressions causing problems in translation in the original questionnaire. Two independent versions of the translation - 'forward' version AV1 and AV2 were prepared by two English translators of Polish origin.

Stage II

The team composed of the above-mentioned translators and co-authors of this publication analyzed both individual items, sets of answers to questions, instructions for filling the scale, as well as its graphic layout. Acceptable discrepancies between the two translations were found, and 6 out of 21 questions showed potential problems with their adaptation to the Polish language. They resulted mainly from the lack of equivalent for a given English phrase (question 17) or from a large number of equivalents that a translator could use (question 5,8,9,13,15). Then the team agreed a common version of the translation - 'forward' version BV.

Stage III

The BV version was translated back into English without backing up the text of the original and 'backward' version - BTV was obtained. The procedure was performed by a person whose native language is English, and has been living in Poland for a few years and is fluent in Polish as well.

Stage IV

Co-author of the source version - SV WOSI questionnaire compared the BTV version with the SV version and indicated discrepancies. The comparisons were also made by a translator who prepared the BTV version and co-authors of adaptation. This allowed to verify the BV version in Polish. As a result of detailed analyses, corrections were made and another Polish version of the 'forward' version CV of the questionnaire was created. Table 1 presents the main changes introduced to the Polish version of WOSI. Also, a frequent change was replacing the wording 'Jak znaczne…' ('How significant…') by 'Jak duże…' ('How much…'), as well as a change of tense in a sentence.

Stage V

The team of experts with many years of experience with orthopedic patients reviewed the version of the CV. The team included: 1 specialist in orthopedics, 1 physiatrist and 3 physiotherapists. Experts assessed the conformity of each question in the SV version with the question in the CV version. They compared whether both questions measure the same symptoms or problems that occur during every day, recreational or professional activity. Conformity was assessed on a 6-point scale from 0 to 5, where 0 means that Polish translation is inadequate and 5 is fully adequate. If the expert assessed the question at level 3 or lower, he was obliged to present an alternative proposal (tab. 2). As a result of the corrections made, another Polish version of the 'forward' version of the questionnaire was created.

Table 1. Changes made to the WOSI of the Polish version during stage IV

No	Source version – SV	Backward translated English version - BTV	Back translation review	Polish versions - BV and CV i.e. version obtained as a result of corrections after backward translation
3	How much weakness or lack of strength do you experience in your shoulder?	How significantly can you feel reduction or lack of strength in your shoulder?	How much do you feel a lack of strength in your shoulder?	**[CV]** Jak duże osłabienie odczuwasz w swoim barku? **[BV]** Jak znaczne osłabienie lub brak sił odczuwasz w swoim barku?
5	How much clicking, cracking or snapping do you experience in your shoulder?	How significantly can you feel clicking, friction or popping in your shoulder?	How much clicking or popping do you have in your shoulder?	**[CV]** Jak dużo klikania i strzelania odczuwasz w swoim barku? **[BV]** Jak znaczne klikanie, tarcie i strzelanie odczuwasz w swoim barku?
12	|——————| not affected extremely affected	|——————| lack of influence extreme influence	|——————| not at all extreme	**[CV]** |——————| wcale ekstremalnie **[BV]** |——————| brak wpływu ekstremalny wpływ

Table 2. Conformity assessment of SV of the WOSI with CV on the example of question number 1

No.	Source version SV	Polish version CV	inadequate translation					translation fully adequate	Assessment 0, 1, 2 or 3
1.	How much pain do you experience in your shoulder with overhead activities?	Jak duży ból odczuwasz wykonując czynności wymagających uniesienia rąk ponad głowę?	0	1	2	3	4	5	Write out badly translated word or expression ……...……. Give your suggestions …….

On the basis of the results of the expert assessment, questions 5 and 17 were identified, to which the experts raised objections. They made also small comments to the questions No. 3,4,19,20. The above questions were subjected to an expert discussion, after which the translations were changed. Question No. 5 - the description of the symptoms 'How much clicking and shooting do you feel in your shoulder' was supplemented with the word 'popping'. Question No. 17 the phrase '... when frolicking or fooling around ...' was changed to '... when frolicking or playing ...'. The experts estimated the translation of the remaining questions as fully adequate.

Stage VI

At the last stage, the DV version of the WOSI questionnaire was tested on a group of six patients - 3 women and 3 men between the ages of 20 and 33 (average 27.2 years). Shoulder instability occurred in 3 subjects, while 3 people were subjected to surgery due to shoulder instability. Ailments have been present for at least 3 months (on average 4.6 months, 3-6 months). Therefore, they had appropriate experience in functioning in everyday life with an unstable shoulder or a operated shoulder, so as to reliably assess the accuracy of questions and the clarity of their wording. The task of the testers was to complete the questionnaire and indicate whether the given questionnaire item and the scale used to answer the questions was fully understood or raised doubts. Answers were rated on a four-level scale, where: 3 means that the question is perfectly understandable, 2 - the question is completely understandable after reading the explanations to the questions, 1 - the question is only partly understandable, even after reading the explanations to the questions, and 0 - the question completely incomprehensible. At the same time, when the question was incomprehensible to the respondent, they were asked to indicate the reason for the lack of understanding.

Analyzing the obtained answers from 6 people, the average score was 2.94. The average grade indicated by the respondents in question 7, 9 and 19 is 2.56 points. The remaining items obtained the maximum score from all testers (3.0).

Questions that raised doubts are: 7. How much discomfort do you feel in your neck muscles due to shoul-

der problems? 9. How much do you use other muscles to compensate for your shoulder problems? 19. How aware are you of the problems regarding your shoulder?

The respondents stated in the survey that the above-mentioned questions are completely understandable after reading the explanations to the questions placed at the end of the questionnaire. Therefore, the experts decided that the information which is in the instructions for patients section: 'If for some reason you do not understand the question, please refer to the explanations at the end of the questionnaire', it will be bolded so that the patient will keep it in mind.

The respondents also assessed the readability of the instructions for completing the WOSI questionnaire, the degree of understanding the explanations to questions, the transparency of the graphic layout, and the complexity of presenting problems in the questionnaire in various areas of life related to the unstable shoulder. They provided answers to the above questions in a scale from 0 to 3, where 3 means full understanding of the questionnaire instructions and explanations to the questions, approval of the layout and full exhaustion of the topic, and 0 is ambiguity of instructions and the lack of explanations to questions, inadequate graphics and covering the topic cursory. According to all the surveyed, the instructions for completing the questionnaire and explanations of the questions are fully understood (average 3 pts), and the questionnaire addresses all areas of life affected by problems related to the unstable shoulder for 5 people and partly to 1 person (2 pts). They also determined the time needed to read the instructions and complete the questionnaire, which averaged 6.5 minutes, in the range of 5 to 9.5 minutes.

After the team of experts had analyzed the patients' responses, corrections were made and the questionnaire assumed the shape of its final version – WOSI-PL (see appendix 1).

Practical considerations

The mean time required to calculate the result obtained on the basis of the WOSI questionnaire is 228 seconds, within the range from 182 to 277 seconds. It was given on the basis of 3-fold calculations for 6 questionnaires completed separately by 5 physiotherapists.

Discussion

Cross-cultural adaptation and validation of measurement tools enables a standardized comparison of test results, thus helping to optimize treatment strategies.

In the case of shoulder instability, the WOSI questionnaire is a measure which is reliable, accurate and sensitive to changes in the patient's condition and officially approved in nine languages to assess patients with shoulder instability.[13,15-22]

Cultural adaptation and translation of WOSI to the Polish version took place according to the guidelines of the Mapi Research Institute, which were in accordance with the procedures suggested by the authors of the source version. Similarly to the Western Ontario Rotator Cuff Index (WORC), adapted to the Polish version by Bejer A. et al. 2017, WOSI conducted a double translation process into Polish and a reverse translation.[23,24] During the creation of the forward version BV, potential problems with adaptation to the Polish language were shown in 6 out of 21 questions, which resulted mainly from too many equivalents for a given English phrase, or lack of such equivalent in question No. 17. Barbosa G et al. had a similar problem in question No 17 by creating the Brazilian version of WOSI.[19] Eventually, the disputable issues were resolved during the creation of the final version based on expert discussions and testing the questionnaire in the final stage of development on a group of 6 patients diagnosed with shoulder instability.

The multistage of conducted research in accordance with international guidelines and the full involvement of the author of the source version resulted in the creation of a well-translated and complete version of the Polish WOSI. It also seems reasonable to try to examine the psychometric characteristics of the questionnaire, which are of key importance in its application.

The Polish version of the WOSI questionnaire is available free of charge for scientific research exclusively with the consent of the WOSI co-author – Sharon Griffin. Please send correspondence to the following e-mail address: sgriffinlaity@gmail.com. This version of the WOSI-PL is attached to this publication. It can be also downloaded from the website of the Holy Family Specialist Hospital in Rudna Mała: http://www.klinika-rzeszow.pl.

Conclusion

1. The Polish version of the Western Ontario Shoulder Instability Index was accepted by the copyright owner and constitutes a valuable tool to evaluate health-related quality of life in patients with shoulder instability.
2. The Polish language version of the Western Ontario Shoulder Instability Index before being introduced to scientific research and clinical practice will be subjected to a validation process in order to assess psychometric properties.

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