

Preliminary test of Polish translation of the Rheumatoid and Arthritis Outcome Score – observational study

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Abstract

Introduction: Today, patients with inflammatory joint diseases participate in more physical activities, including sports and recreation. The tools currently used to assess quality of life and functioning in rheumatic diseases, available in Polish, do not address these problems. The Rheumatoid and Arthritis Outcome Score (RAOS) questionnaire was developed but is not available in the Polish language. This tool is used to evaluate the functional limitations of physically active people who suffer from arthritis and associated lower limb disorders. The objective of this study is the translation and cross-cultural adaptation of the RAOS into Polish.

Material and methods: The process was carried out following the guidelines of the Evidence-Based Medicine Committee of the American Academy of Orthopaedic Surgeons (AAOS). The translation included forward and back translation, and synthesis of the transcripts. The RAOS was pre-tested in a target setting in 19 patients and final amendments were made to address concerns raised by the patients.

Results: The translation, adaptation, and pre-test of the Polish RAOS resulted in the final version of the scale, which can be found in *Supplementary material 1*.

Conclusions: During pre-testing, the scale demonstrated ease of understanding, with patient feedback leading to minor corrections that were incorporated into the questionnaire structure. Before widespread implementation, a crucial step involves validating the scale through rigorous psychometric tests, including assessments of the reliability, validity and stability of the Polish RAOS. The lack of validation of the translated Polish version limits the use of the RAOS in the research environment. To solve this problem, the validation process is planned to be carried out in the next stage.

Key words: rheumatology, arthritis, rheumatoid, patient-reported outcome measure.

Introduction

New and more effective methods of treatment of autoimmune diseases have allowed patients with inflammatory joint diseases to perform more physical activities, including sports and recreation. These are also very beneficial for health outcomes in this group of patients [1]. Tools currently used to assess disease activity, such as the Disease Activity Score with 28-joint count (DAS28), do not fully reflect the patient's health status, daily functioning, quality of life, and sports [2]. Furthermore, available patient-reported outcome measures in Polish, such

as arthritis impact measurement scales (AIMS), focus mainly on upper limb function [3]. The recently developed Rheumatoid and Arthritis Outcome Score (RAOS) questionnaire includes questions about both sports activities and function of the lower extremities. It can complement already available tools or serve as an independent assessment method for patients with autoimmune joint diseases but is not yet available in the Polish language [4].

The RAOS is an adaptation of the Knee injury and Osteoarthritis Outcome Score (KOOS), created to assess symptoms and functional limitations associated with chronic inflammatory joint disease and lower extremity

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problems. It consists of 42 elements that assess 5 separate patient-relevant dimensions [5]:

- Pain (9 items),
- Other symptoms, such as stiffness, swelling, and range of motion (7 items),
- Activities of daily living (ADL) (17 items),
- Sports and recreational activities (Sport/Rec) (5 items),
- Quality of life related to the lower limb (QOL) (4 items).

The RAOS questionnaire uses a 5-point Likert scale to answer each question. The simple and accessible format for patients increases patient involvement in the assessment process. The RAOS scale allows the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score to be calculated from the RAOS questionnaire, providing additional utility for clinicians [6].

The purpose of this study is the translation and cross-cultural adaptation of the RAOS into Polish. The questionnaire will be pre-tested in a target setting, and final amendments will be made to address concerns raised by patients.

Material and methods

The translation of the RAOS scale into Polish followed the guidelines of the American Academy of Orthopaedic Surgeons (AAOS). In the initial stage, two independent translators, both native Polish speakers, translated the questionnaire. The first translator had a medical background, while the second did not. In the second stage, translations were synthesised to address inconsistencies. In the third stage, two English native speaker translators created back translations. The expert committee resolved discrepancies in the fourth stage, producing the pre-final version. The final stage involved pre-testing in a target setting to address patient concerns. The translation process prioritised cultural and linguistic considerations, ensuring accuracy and comprehensibility. The initial translation focused on maintaining semantic accuracy. The cultural and linguistic assessment ensured relevance in the Polish context. Verification by a physician and proofreading eliminated errors. The trial completion of the questionnaire by the target group evaluated its comprehensibility and usability. Adaptations were made to meet patient needs. Feedback and corrections resulted in a final version ready for clinical use [7]. Pretesting, crucial in translating measurement tools such as the RAOS scale, assessed comprehensibility, correctness, and usability. A representative group of individuals with rheumatic diseases tested the translated RAOS scale, providing feedback on understanding. Adjustments were made based on participant feedback, ensuring consistency with the survey context. The pre-test results informed corrections, leading to the creation of a final version ready for use. This

step proved essential to identify and rectify potential errors before final release [8].

Bioethical standards

Written informed consent was obtained from all patients, and the study protocol was approved by the institutional committee on human research, ensuring that it conformed to the ethical guidelines of the Declaration of Helsinki. Permission to conduct the study was granted by the Bioethics Committee of the Medical University of Warsaw (AKBE1952018).

Results

The translation, adaptation, and pre-test of the Polish RAOS in 19 patients resulted in the final version of the scale, which can be found in *Supplementary material 1*. The pre-testing was a key step in the process of improving the RAOS scale, allowing us to identify any shortcomings or inaccuracies in the original version. Thanks to the feedback and observations collected from patients during pre-testing, the scale was effectively adjusted, considering comments, to better match the measurement intentions and make it more understandable. The user guide and the information on scale calculation are included in *Supplementary material 2*.

Discussion

The lack of validation of the translated Polish version limits the use of the RAOS in the research environment. To solve this problem, the validation process is planned to be carried out in the next stage in the Department of Rehabilitation of the National Institute of Geriatrics, Rheumatology and Rehabilitation, Warsaw, Poland. The general limitation of the RAOS questionnaire is the subjectivity of the complementary patient assessment. The scale relies heavily on the patient's opinion, which may introduce some degree of uncertainty and depend on the patient's perception [6]. The questionnaire also does not include objective parameters of the disease, such as laboratory results or the clinical picture, which may limit its objectivity. Furthermore, the RAOS scale does not consider psychosocial factors, which can also have a significant impact on the quality of life of a patient. However, an important aspect of the RAOS is the attempts made by the authors to objectivise standardised answers to individual feelings or emotions. It is done by complex analysis of different groups of problems studied. The RAOS includes a domain that assesses symptoms with questions about typical problems in rheumatic diseases such as swelling of the joints (S1) and restriction of range of motion (S2–S5). Stiffness is assessed both in the morning (S1)

and during the day (S2). Pain domains include general pain assessment (P1) and pain sensations assessed during specified activities (P2–P9). The next domains evaluate almost every type of daily activity (A1–A17), such as walking (A6), standing (A4), and sitting (A14). The other five questions (SP1–SP5) assess sports-related problems during many types of activities such as running (SP2) or jumping (SP3). The last domain is used to evaluate the influence of the disease on general health perception and mental well-being of patients (Q1–Q4) [4].

In conclusion, the RAOS scale is a useful tool for holistically assessing the impact of chronic inflammatory joint disease in patients. However, its subjectivity and lack of evaluation of objective parameters may present some limitations. In clinical practice, it is worth using this scale in combination with other objective and subjective measures [6].

So far the RAOS has been translated into and validated in several languages other than English. The Persian version of the RAOS has been validated in patients with rheumatoid arthritis (RA). Validity was evaluated by comparing the RAOS results with the Short Form 36 Health Survey Questionnaire (SF-36) and the Short Form 2 Arthritis Impact Measurement Scales (AIMS2-SF). The intraclass correlation coefficient (ICC) > 0.70 and the Cronbach $\alpha > 0.70$ were obtained on most subscales. Significant correlations have been observed between the RAOS subscales and the SF-36/AIMS2-SF subscales [9]. The Turkish version was also validated in patients with RA. The ICC for the subscales was 0.76 to 0.94 and the Cronbach α ranged from 0.81 to 0.94 [10]. The French version was tested in patients with RA and showed ICC for RAOS subscales from 0.76 to 0.91 and Cronbach's α ranging from 0.73 to 0.91 [11].

The use of the RAOS has been described in numerous studies in various settings. It can be used to assess multiple joints, but it is also excellent for assessing single joint function such as knee or foot function [12, 13]. It can be used to assess long-term changes in the impact in the impact of disease on physical functioning [14]. Other uses include evaluation of the clinical response to therapy in RA, e.g., anti-TNF-acting drugs such as certolizumab [15], or the effect of intraarticular injections [11]. The questionnaire has also been used in nonrheumatic diseases. The RAOS version for children was used to assess generalised joint hypermobility [16]. The RAOS was also used to assess disability in young adults with thalidomide embryopathy [17].

Conclusions

The RAOS scale is well suited for use in the Polish version, and, according to the presented pre-test, offers a thorough assessment of the impact of chronic inflam-

matory joint disease on various aspects of a patient's life. Covering dimensions such as pain, symptoms, daily activities, sports, and overall quality of life, the scale emphasizes the patient's perspective, enhancing the understanding of both the patient and the physician. The clear and accessible format of the questionnaire promotes patient participation in the evaluation process, contributing to the reliability and contextual significance of the information collected through the RAOS scale. An additional advantage is the ability of the scale to generate scores based on the WOMAC, allowing clinicians to leverage both tools in a multidisciplinary approach to joint disease assessment and management.

During pre-testing, the scale demonstrated ease of understanding, with patient feedback leading to minor corrections that were incorporated into the questionnaire structure. Before widespread implementation, a crucial step involves validating the scale through rigorous psychometric tests, including assessments of the reliability, validity and stability of the Polish RAOS.

Disclosures

Conflict of interest: The authors declare no conflict of interest.

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Data availability: The data that support the findings of this study are available on request from the corresponding author (A.Z.).

Supplementary materials are available on the journal's website.

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