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ORIGINAL RESEARCH

Translation, cross-adaptation and measurement properties of the Brazilian version of the ACL-RSI Scale and ACL-QoL Questionnaire in patients with anterior cruciate ligament reconstruction[☆]

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KEYWORDS

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Reliability;
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Abstract

Background: Scales to assess the quality of life and return-to-sport after reconstruction of the anterior cruciate ligament (ACL) may help the clinical decision-making process.

Objective: To cross-culturally adapt and determine the validity of the Brazilian versions of the Anterior Cruciate Ligament Return to Sport after Injury (ACL-RSI) and the Quality of Life Questionnaire (ACL-QoL).

Methods: The process of translation and cross-cultural adaptation followed the recommendations of international guidelines. One hundred participants filled out the Brazilian versions of these instruments, the Tampa Scale for Kinesiophobia (TSK), the International Knee Documentation Committee (IKDC) Subjective Knee Evaluation Form, and the SF-36 Questionnaire. The measurement properties of reliability, internal consistency and construct validity were measured.

Results: The ACL-RSI and the ACL-QoL were successfully translated and cross-culturally adapted. Both questionnaires showed good test-retest reliability ($ICC_{2,1} = 0.78$, 95% CI = 0.67–0.85 for the ACL-RSI; and $ICC_{2,1} = 0.84$, 95% CI = 0.76–0.90 for the ACL-QoL) and good internal consistency (Cronbach's $\alpha = 0.87$ for the ACL-RSI; and Cronbach's $\alpha = 0.96$ for the ACL-QoL). A reasonable correlation was found between both questionnaires and the TSK, and a low to reasonable correlation was found between the questionnaires and the SF-36 in terms of validity. Compared to the IKDC Subjective Knee Evaluation Form, the ACL-RSI had a reasonable correlation and the ACL-QoL had a good correlation.

[☆] Ethical Committee of Federal University of Ceará number: 838.253.

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Conclusion: The Brazilian versions of the ACL-RSI and the ACL-QoL have adequate measurement properties and may be used in assessing Brazilians after ACL reconstruction.

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Introduction

Anterior cruciate ligament (ACL) injuries are typically severe and occur mainly during sports practices involving contact, jumps, and pivot movements.¹ These are common orthopedic injuries, with an annual incidence of 68.6 per 100,000 people.² It is estimated that in the United States there are approximately 200,000 cases annually,³ of which a high percentage require surgical reconstruction to restore the functional stability of the knee, thus allowing the resumption of recreational and sports activities.^{3,4}

Although one of the main objectives of ACL reconstruction surgery is to make it possible for patients to return to sport and perform at the pre-injury level, a high percentage does not reach that goal.^{5–8} A systematic review⁸ revealed that 81% of individuals who sustained an ACL injury returned to sports, but only 65% performed at the pre-injury level and only 55% reached the competitive level. The reasons for this are multifactorial and may include issues relating to the surgery and rehabilitation that have repercussions in terms of physical function and demographic, social, or psychological factors, such as fear, anxiety, and self-confidence.⁸ The latter reasons are often neglected. Several studies have investigated the function of the knee after ACL reconstruction, but few have reported the psychological impact upon returning to sports after surgery.^{9–11}

Another aspect of ACL injury is related to quality of life (QoL). A recent systematic review with meta-analysis showed that ACL-deficient individuals have impaired QoL compared to the normal population and that there is no difference between the QoL of individuals who are chronically ACL-deficient and those who have undergone surgical reconstruction.¹² Therefore, scales capable of evaluating the QoL of patients with ACL injuries and the psychological factors involved in the return to sport after reconstruction surgery can facilitate clinical decision making for each patient.

The Scale to Measure the Psychological Impact of Returning to Sport After Anterior Cruciate Ligament Reconstruction Surgery (ACL-RSI) is a self-report scale containing 12 items subdivided into 3 domains: emotions, performance and risk assessment.¹⁰ The Quality of Life Outcome Measure (Questionnaire) for Chronic Anterior Cruciate Ligament Deficiency (ACL-QoL) is an instrument developed with the objective of evaluating the quality of life of patients with chronic injury ACL and it contains 31 items that are subdivided into 5 domains: Symptoms and Physical Complaints, Work-Related Concerns, Recreation Activities and Sport Participation or Competition, Life Style and Social and Emotional Aspects.¹³ Both instruments have been translated, adapted and have their measurement properties tested into

several languages^{14–18} and have shown to have good reliability and responsiveness, but there are no versions adapted into Brazilian-Portuguese. Therefore, the objectives of this study were the translation and cross-cultural adaptation of these tools and the verification of their validity and reliability.

Methods

Study design

This study was divided into two stages. In the first, the translation and cross-cultural adaptation of the ACL-RSI and the ACL-QoL were performed. In the second stage, the measurement properties of both instruments were verified, following a longitudinal prospective study model.

The study was conducted at the Laboratory of Analysis of Human Movement at the Universidade Federal do Ceará (UFC), Fortaleza, CE, Brazil, between November 2014 and June 2016.

The sample consisted of 100 participants with ACL injuries who underwent reconstructive surgery at least three months prior to the study and who practiced some sporting modality. The sample size was determined according to Terwee et al.,^{19,20} which suggests that at least 50 patients are required for an appropriate analysis of construct validity, reproducibility and ceiling and floor effects, and a minimum of 100 patients to analyze the internal consistency.

We included those aged 16–50 who had unilateral lesions of the ACL and excluded those with grade 3 collateral ligament injuries, bilateral rupture of the ACL, and posterior cruciate ligament injuries.

This study was approved by the Research Ethics Committee of the UFC (Protocol Number: 838.253). All participants were educated about the procedures and gave informed consent to participate in the study. All participants had the right to withdraw at any time.

Translation and cross-cultural adaptation procedure

The process of translation and cross-cultural adaptation of the ACL-RSI and ACL-QoL tools for Brazilian Portuguese was authorized by the authors of the original questionnaires and followed the pre-established recommendations of international guidelines.^{21,22} The ACL-RSI and ACL-QoL were translated from English into Brazilian Portuguese by two native translators fluent in English; one is a professional in the health field with experience in traumatology and orthopedics and the other is a professional translator. The

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