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Scientific/Clinical Article

## Brazilian version of the Patient Rated Wrist Evaluation (PRWE-BR): Cross-cultural adaptation, internal consistency, test-retest reliability and construct validity



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### ARTICLE INFO

#### Article history:

Received 1 April 2014

Received in revised form

23 September 2014

Accepted 30 September 2014

Available online 8 October 2014

#### Keywords:

Cross-cultural adaptation

DASH

Patient rated wrist evaluation

Questionnaire

Reliability

SF-36

Validity

### ABSTRACT

*Study design:* Clinical measurements.

*Purpose:* Perform the translation and cross-cultural adaptation of the Patient Rated Wrist Evaluation (PRWE) into a Brazilian version (PRWE-BR), and assess its internal consistency, test-retest reliability and construct validity.

*Methods:* PRWE-BR was developed using standardized guidelines. Sixty-one patients with different wrist injuries were recruited. They were submitted to two assessments, 2–7 days apart. Reliability was measured by internal consistency (Cronbach's alpha) and test-retest reliability (Intraclass Correlation Coefficient). Construct validity was determined via hypothesis testing (Spearman's correlation) of correlations with subscales of SF-36 and DASH.

*Results:* PRWE-BR and its subscales achieved high internal consistency (Cronbach's alpha  $\geq 0.85$ ) and excellent test-retest reliability (ICC  $\geq 0.90$ ). Construct validity was established by confirmation of 85.7% of our previously formulated hypotheses.

*Conclusions:* PRWE-BR is a valid and reliable tool for the assessment of pain and dysfunction in Brazilian patients with injuries involving the wrist joint.

*Level of evidence:* N/A

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### Introduction

Orthopedic wrist injuries are fairly common in clinical practice, resulting in pain and dysfunction that can persist for a substantial period of time.<sup>1</sup> Usually therapists rely on the assessment of objective measures, such as goniometry and dynamometry, but it is known that those measures are not able to capture the patient's perception of the outcomes.<sup>2</sup> For that reason, it is recommended that therapists should integrate patient rated outcome measures to their clinical practice assessment tools.<sup>3,4</sup>

The majority of currently available patient rated outcome measures are developed in English speaking countries, and must be submitted to a standardized process of cross-cultural adaptation

and measurement properties testing prior to its use in other language and cultural context.<sup>5,6</sup>

There are some upper extremity assessment questionnaires available in Brazilian Portuguese, such as the Disabilities of the Arm, Shoulder and Hand (DASH), the Patient Rated Tennis Elbow Evaluation (PRTEE), the Boston Carpal Tunnel Questionnaire (BCTQ), the Michigan Hand Questionnaire (MHQ) and the Shoulder Pain and Disability Index (SPADI).<sup>7–11</sup> Nevertheless, until the present moment there is no specific instrument to assess outcomes after injuries on the wrist joint. The Patient Rated Wrist Evaluation (PRWE) is a 15 item joint-specific instrument originally developed with the purpose of assessing pain and function in patients with distal radius fractures.<sup>12</sup> The PRWE allows patients to rate their levels of pain (5 items) and disability (10 items) on a 0–10 scale. A detailed description of the development process, scoring instructions and testing of the measurement properties of PRWE are available elsewhere.<sup>13</sup>

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Recent studies point out PRWE as one of the most common upper extremity patient rated outcome measures in clinical practice, usually applied in patients with distal radius fractures, but also in several other wrist and hand injuries.<sup>3</sup> Regarding its measurement properties, PRWE has shown excellent reliability, validity and responsiveness.<sup>14,15</sup> MacDermid and colleagues concluded that PRWE is more sensitive to detect small changes in clinical outcomes of patients with wrist injuries when compared to other questionnaires, such as SF-36 and DASH.<sup>16</sup> Also, PRWE is easier and faster to fill out when compared to the DASH, considering it has fewer items.<sup>15,17</sup>

The PRWE is available in several languages, including Danish, Hindi, Korean, Italian, German, Swedish, Dutch, Japanese and Chinese.<sup>17–27</sup> Besides those languages, there are reported translations in Czech, French, Hungarian, Russian, Ukrainian and Norwegian.<sup>28,29</sup>

### Purpose of the study

The aim of the present study is to perform the translation and cross-cultural adaptation of the Brazilian version of the Patient Rated Wrist Evaluation (PRWE-BR), and assess the following measurement properties: internal consistency, test-retest reliability and construct validity.

### Methods

Initially, we established contact with the author of the original version, who gave us permission to conduct the cross-cultural adaptation of PRWE. The present study was approved by the local research Ethics Committee (HCFMRP/USP – number 32330/2012).

#### *Translation and cultural adaptation process*

Translation and cross-cultural adaptation of PRWE was conducted according to the guidelines proposed by Beaton,<sup>6</sup> through six documented stages, as follows.

The first stage involved the forward translation of the original PRWE, performed by two native Brazilian Portuguese speakers. One of the translators was a physical therapist with fluency in the English language, aware of the purpose of our study. The second translator was an English teacher; lay on the subject of the questionnaire. Both translators were instructed to provide alternative translations to all terms considered difficult to translate, and also to use a vocabulary that would be easily understood by a 12-year old Brazilian person.<sup>5</sup> The second stage was the synthesis of both initial translations, performed by an expert committee composed of five experienced individuals in the field of interest, being four hand therapists and one hand surgeon. After that stage, the synthetic version was submitted to two back translations, performed by two independent native English speakers, who did not had any contact with the original questionnaire prior to their back translation. The expert committee gathered once again in possession of the original questionnaire, its translations and back translations to consolidate the pre-final version of the instrument, and minor cultural adaptations were performed. All decisions were achieved in consensus. The pre-final version was then submitted to pretesting on 30 native Brazilian Portuguese speakers, being 15 health professionals and 15 patients with wrist injuries. The respondents were asked to read the instructions and items carefully, and state their comprehension through a check box containing the answers “yes” and “no”. A comprehension level of at least 80% was established for all items and instructions (e.g., in case any item or instruction was not understood by more than 20% of respondents, it would be reformulated and tested on a new sample until it reached our established level of comprehension).<sup>7</sup>

#### *Testing of the measurement properties of PRWE-BR*

##### *Subjects*

Sixty-one patients with orthopedic wrist injuries, treated by conservative or surgical methods and referred to physical therapy were prospectively recruited during this stage. Inclusion criteria were to be a Brazilian Portuguese native speaker, with age of at least 18 years old and ability to fill out the questionnaires without great assistance. All patients included in our study were out of their immobilization apparatus (casts or orthoses) for at least one week prior to the assessment, and where undergoing treatment for their injury (either weekly physical therapy sessions or monthly appointments for follow up on their home based rehabilitation program). Exclusion criteria were wrist injuries of rheumatologic or neurological background and concomitant injuries on other upper extremity joints.

##### *Outcome measures*

**PRWE.** As presented earlier, the Patient Rated Wrist Evaluation (PRWE) is a 15 item joint-specific instrument originally developed with the purpose of assessing pain and function in patients with distal radius fractures.<sup>12</sup> The pain subscale (PRWE-P) is composed of five items, being four of them related to the intensity and one about the frequency of pain. The function subscale (PRWE-F) comprises the ten remaining items; six of those about specific activities and four about usual activities. Each item is scored on a 0–10 scale. The total score (100 points) is achieved by adding the pain subscale score (sum of the first 5 items) to the function subscale score (sum of the 10 remaining items divided by two). The higher score indicates the worst level of pain and/or dysfunction perceived by the patient.<sup>12–14</sup>

**DASH.** The Disabilities of the Arm, Shoulder and Hand (DASH) is a region-specific questionnaire widely used as an outcome instrument in patients with upper limb injuries.<sup>30</sup> It has 30 items rated on a Likert scale of five points, with a total score ranging from 0 to 100. Larger scores indicate worst perceptions of pain and disability on the upper limb. The DASH is considered a reliable, valid and responsive tool tested in several populations, including patients with distal radius fractures.<sup>31</sup> For the purpose of our study, we used the Brazilian version of DASH.<sup>7</sup>

**SF-36.** The Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36) is a self-report quality of life assessment questionnaire. It has 36 items, divided in eight subscales: physical functioning, role physical, bodily pain, general health perceptions, vitality, social role functioning, emotional role functioning and mental health.<sup>32</sup> Each scale is scored in a range from 0 to 100. The lower score represents the worst degree of disability for that particular scale. The SF-36 is currently available in several languages, including Brazilian Portuguese.<sup>33</sup> For the purpose of our study, we collected scores for the following subscales: physical functioning (PF), role physical (RP), bodily pain (BP) and mental health (MH).

##### *Data collection protocol*

At baseline assessment, patients who fulfilled our inclusion criteria and agreed to participate were instructed about the purpose of the study and signed an informed consent term. We collected information about their age, gender, hand dominance, type of injury, injured side, cause of injury, treatment method and surgical procedures. Then, patients randomly filled out the three outcome measures: PRWE-BR, DASH and SF-36.

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