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## Cross-cultural adaptation and psychometric testing of the Arabic version of the Patient-Rated Wrist Hand Evaluation (PRWHE-A) in Saudi Arabia

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## ABSTRACT

**Purposes:** The purposes of this study was to 1) perform a cross-cultural Arabic translation for the Patient-Rated Wrist and Hand Evaluation (PRWHE-A) using standardized guidelines and, 2) to test the psychometrics properties of the translated measure.

**Methods:** A total of 48 patients with variety of hand disabilities, a mean age of  $47 \pm 16$  years were recruited and assessed two times. The intraclass correlation coefficient (ICC) was used for assessing test-retest reliability of the PRWHE-A and its subscales while Cronbach's alpha (CA) was used for assessing the internal consistency. Construct validity was assessed by examining the strength of the correlation between the PRWHE-A and the Arabic version of the Disability of the Arm, Shoulder and Hand (DASH-A).

**Results:** The PRWHE-A demonstrated excellent test-retest reliability (ICC = 0.97) and internal consistency (CA = 0.96). The DASH-A demonstrated moderately to low correlation ( $r = 0.64$ ) with the PRWHE-A.

**Conclusions:** The results of this study indicated that PRWHE-A is a reliable and valid assessment tool and can be used in patients with different wrist/hand disabilities whose primary language is Arabic.

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## Introduction

With a growing emphasis on patient-centered care, patients' self-reported outcome measures (PROs) provide a standard approach to measuring health and disability associated with musculoskeletal disorders.<sup>1</sup> The usability and practicality of PROs in hand clinics are recognized and appreciated.<sup>2–5</sup> First, this method uses a patient-centered care approach by engaging the patients in the clinical decision-making process. Second, PROs determine the condition of patients at the time of assessment and track their progress over time. Third, it enables hand therapists to ensure that a change in a patient's status is attributed to the effectiveness of their intervention.<sup>6</sup> Finally, PROs are designed to be easily administered and time efficient.

PROs can be joint-specific, condition-specific or generic measures of a person's function and disability. In clinical practice,

selection of such an outcome measure within a particular context is based on the intention of the measurement such as symptoms and functional status, as well as the measurement properties of the tool itself.

Different outcome measures have been developed to help clinicians assess hand pain and disability from the perspective of their patients. The Disability of the Arm, Shoulder and Hand (DASH)<sup>7</sup> questionnaire is a regional outcome measure introduced by the American Academy of Orthopedic Surgeons in collaboration with the Institute for Work & Health.<sup>8</sup> The DASH contains 30 items designed to assess the symptoms and function of the upper extremity at the person level. It takes the patient about 10–15 min to complete.<sup>9</sup> The DASH questionnaire is proven to be the most clinically used outcome measures due to its reliability, validity and responsiveness among numbers of upper extremities pathologies.<sup>7,8</sup> It has been adapted and validated for use in Arabic language as well as others.

The translation of the Arabic version (DASH-A)<sup>10</sup> addressed language and cultural considerations, and found adequate face, content validity and high internal consistency at Cronbach's alpha (CA) = 0.96. The DASH-A license was issued and posted on the

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official DASH website: <http://www.dash.iwh.on.ca/translate.htm>.<sup>7</sup> Further evaluation of the psychometric properties of the DASH-A is required to support the utility of the Arabic version of the questionnaire as an upper extremity outcome measure.

Subsequently, the Patient-Rated Wrist and Hand Evaluation (PRWHE)<sup>11–14</sup> is one option that has shown excellent reliability and validity across different clinical conditions.<sup>13</sup> The PRWHE is a 15-item questionnaire (5 ‘pain,’ 10 ‘function’ items), designed to measure pain and function of wrist and hand joints.<sup>11,14</sup> Items are scored on a 0–10 metric where 10 is the worst possible score. The total score is calculated by the sum of the pain items, plus the half of the sum of the function items. The maximum score is 100, with higher scores indicating maximal (sever) pain and function. It takes on average 6 min to complete.

It has been suggested that the PRWHE should be preferred over the DASH when assessing wrist function since it is a joint-specific tool.<sup>13</sup> Furthermore, the PRWHE is shorter than the DASH and is more quick and easy to fill out.<sup>15</sup> Although alternate language versions of the PRWHE are available,<sup>15–25</sup> there is no Arabic version of the PRWHE.

Most health status measures were developed in English-speaking countries<sup>26</sup>; therefore, in most cases clinicians and researchers may not include immigrant populations when developing such measures. This may result in systematic bias in studies of health care use or quality of life, especially in terms of excluding those who speak a language other than the source language.<sup>26,27</sup> However, since it is time consuming and very expensive to develop new instruments, less suitable alternative measures are often utilized for populations where English or the tool source language is not the first language. Consequently, the cross-cultural adaptation of PROs for use in a new country, culture, or language is needed. Such studies should consider using standardized methods to reach equivalence between the original source and target versions of the new instrument.<sup>28</sup>

Simultaneous, the aim of this study was to perform a cross-cultural translation of the English version of the PRWHE into Arabic (PRWHE-A) using standard translation procedures and to test the psychometrics properties of the translated measure to ensure it retains expected measurement properties.

## Material and methods

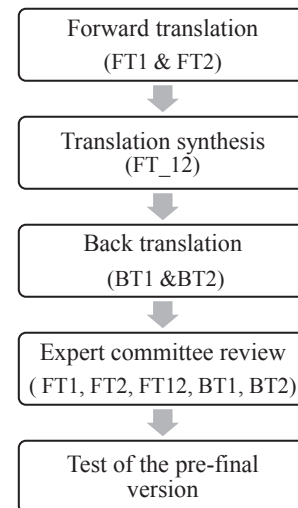
### Study design

This study had a cross-sectional design. Participants were recruited from April to May 2014 in two phases: phase I to test the pre-final version of PRWHE-A, and phase II to test the psychometric properties of the final version of the translated questionnaire as well as to validate the DASH-A.

### Phase 1—translation of PRWHE-A

The five-step cultural translation guidelines proposed by Beaton et al.<sup>27–29</sup> were followed in adapting and translating the standard version of the PRWHE into Arabic. Per these guidelines, the following steps to translation were taken as shown in Fig. 1. Two independent bilingual physiotherapists, who were fluent in Arabic, produced the initial translations (FT1, FT2). Neither of these two were professional translators nor were they language specialists. Only one translator was aware of the concepts being examined in the original questionnaire.

The two translated versions were compared for discrepancies by one of the authors (FH). These were discussed with the developer (JM) and synthesized into one version (FT\_12) by a third independent translator, who had no clinical background, to detect any



**Fig. 1.** Cross-cultural adaptation process of the PRWHE-A. Where, FT1 = first initial translation version; FT2 = second initial translation version; FT\_12 = synthesized initial translation version; BT1 = first backward translation version; BT2 = second backward translation version.

interpretation issues for patients. The synthesized version was back-translated independently (BT1, BT2) by two bilingual linguistics experts who live in Saudi Arabia, Jeddah and operated certified translation services for more than 15 years.

An expert committee, which consisted of the forwards and back translators ( $n = 3$ ), physiotherapists ( $n = 3$ ), linguistic experts ( $n = 2$ ), and the developer ( $n = 1$ ), reviewed the synthesized translated version and the back-translated version. Item numbers 6, 7, 10, and 11 were modified in order to improve the practical equivalence of the translated questionnaire. The committee evaluated consolidated versions and approved the pre-final version of the questionnaire for clinical testing.

A sample of 6 participants (3 female and 3 male) with different hand conditions tested the pre-final version using a cognitive interview process.<sup>30,31</sup> The cognitive interviewing process is a method for evaluating self-report survey questionnaires. It was developed to collect additional information about the questionnaire responses to determine whether the questions address what the questionnaire intended to measure. Therefore, this step was done to test whether respondents understood the items, how they determined their responses, and whether items were acceptable given the values, beliefs and characteristics of the target population.<sup>29</sup> Each participant was asked to answer the questionnaire and then discuss their response (i.e., how they interpreted each item on the questionnaire) with the interviewer. Each participant was interviewed face-to-face by the same person (FH).

### Phase 2—testing the psychometric properties of PRWHE-A

The main purpose of this phase was to estimate the test-retest reliability, internal consistency and validity of the PRWHE-A and DASH-A. The study was conducted at King Abdul-Aziz University (KAU) educational hospital, a governmental setting in Saudi Arabia, where the national language is Arabic.

### Reliability

Test-retest reliability of the PRWHE-A requires testing of responses over a stable interval. Given the relatively acute nature of the hand conditions in our sample, participants were retested within 24 h. Since there is no standard time interval recommended for retesting,<sup>32</sup> we made the decision to retest at a stable interval

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