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Brief Report

The patient-rated wrist and hand evaluation was successfully translated to Persian



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Rationale

Measuring outcomes is important to determine the effectiveness of therapeutic interventions. Pain and disability are the most important sequels of hand injuries and can impact the final intervention goal of promoting hand function. Thus, identifying the appropriate functional assessment tool is important. There are a number of patient-rated questionnaires to assess disability in the hand and wrist. The patient-rated wrist evaluation¹ has been widely used to assess outcomes of wrist and hand conditions and was originally developed for distal radius fracture. The patient-rated wrist evaluation was later modified as the patient-rated wrist and hand evaluation (PRWHE)² to address all hand conditions.

The aim of this study was to develop the Persian version of the PRWHE and also evaluate its psychometric properties. To do so, construct and convergent validity was evaluated with the Disability of the Arm, Shoulder and Hand (DASH) questionnaire. Test-retest

reliability was assessed as well. The measurement error was determined by calculating the standard error of measurement (SEM). Based on the SEM, the minimum detectable change (MDC) was determined.

Original measure

Patient-rated wrist and hand evaluation.

Construct measured

The construct measured was pain and disability with 3 subscales: pain, specific activities, and usual activities.³

Structure

The PRWHE² is a 15-item questionnaire (5 pain items and 10 function items), designed to measure pain and disability of wrist and hand joints. Items are scored on a 0-10 scale, where 10 is the worst possible score. It takes on average 6 minutes to complete.

Scoring

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 (severe) pain and function.⁴

There is no funding or grants in this inquiry.

This study was conducted in compliance with the moral, ethical, and scientific principles governing clinical research as set out in the Declaration of Helsinki. Before taking part in the study, subjects signed the informed consent that had been approved by The University of Social Welfare and Rehabilitation Sciences Ethics Committee (IR.USWR.rec.1394.71).

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Current language and cultural context

The PRWHE was translated from its original English version to Persian version to facilitate usage of PRWHE in the eastern culture.

Cross-cultural translation process

The translation was performed as recommended by the World Health Organization's procedures for cross-cultural validation and adaption of self-report measures.⁵

Contributors

Translation was performed by 4 bilingual health professionals (hand therapist and epidemiologist).

Forward translation

Two bilingual health professionals (a hand therapist and an epidemiologist) whose first language was Persian translated the questionnaire. These health professionals were not familiar with the tool; they just translated it to Persian.

Two bilingual health professionals and a hand surgeon who were familiar with the tools conceptually reviewed and adapted the initial translation on consensus.

Backward translation

After the forward translation process and consensus on the new Persian version of the questionnaire, a bilingual hand therapist whose first language was English and had expertise in rehabilitation and in the development of standardized questionnaires performed backward translation with just a literate perspective. The final back-translated English version was sent to the developer of PRWHE to check the items conceptually for potential areas of discrepancy.

Reconciliation and harmonization

The new Persian version was compared with the original version by all involved translators to find consensus. Item numbers 6, 10, and 11 (all function questions) were modified to improve the practical equivalence of the translated questions. The modifications were done to improve understanding of the aimed activity due to cultural differences. "Turn a doorknob using my affected hand" was modified because the term doorknob is not very popular in the eastern societies. "Carry a 10lb object in my affected hand" was changed because the current weight unit is kilograms. "Use bathroom tissue with my affected hand" was not modified but needed some additional explanations for some of the respondents' due to their traditions to use water instead of bathroom tissues.

Cognitive debriefing or pilot testing

This version was tested on 5 participants (3 females and 2 males) with different hand injuries by using a cognitive interview process.⁶ The interview investigated their understanding of the individual items, determined cognitive equivalence, and was followed by a debriefing, which indicated that the 5 participants had no difficulties with the items. Afterward, a final version was finalized by consensus.

Table 1

List of items that were adjusted during cross-cultural translation

Original items	Modified items
Turn a door knob using my affected hand	Using a key to open a closed door
Carry a 10 lb object in my affected hand	Carry a 5 kg object in my affected hand
Use bathroom tissue with my affected hand	Clarified for those who use water instead of bathroom tissues

Adaptation of items

The phrase *doorknob* was replaced with *using a key to open a closed door*, after discussion with the developer to retain the concept of a common functional task requiring forearm rotation. Also, due to difficulty in estimating weight of an object in pounds as mentioned in question 10, this question was changed to *Carry a 5-kg object in my affected hand*. The item *Use bathroom tissue with my affected hand* was not modified, but extra clarification was added to it so as to accommodate those who use water instead of bathroom tissues (Table 1).

Validation sample

From April to May 2014, 205 consecutive patients referred to the Iran hand rehabilitation clinic for different upper-extremity conditions were included. Mean age was 40 years (standard deviation [SD], 15; range, 18–60), and symptom duration was of more than 2 months. About 67% of patients were females, 87% of patients were right handed, 19% had a fracture, 66% had tendonitis, and 25% had compression neuropathy.

Written informed consent was obtained from all participants before study entry. The study was performed in accordance with the 1964 Helsinki declaration and its later amendments and approved by the Ethics Committee, Tehran, Iran (IR.USWR.rec.1394.71).

Procedures for validation

A cross-sectional study was used to evaluate validity and test-retest reliability across 7 days. Demographic data were collected, and the Persian version of both PRWHE and DASH questionnaires was completed on a single occasion.⁷ After 2 weeks, the patients were asked to complete the PRWHE in the clinic or via electronic mail.

Construct validity was assessed by means of internal consistency with Cronbach alpha. Convergent validity was analyzed by means of Pearson correlation analyses between the translated version of the PRWHE and the DASH.

Test-retest reliability was assessed comparing 2 PRWHE performed 2 weeks apart using interclass correlation coefficient (2, 1 – a 2-way analysis of variance random effect model for agreement).

The measurement error was determined by calculating the SEM, which is a measure of within-subject variability defined as the SD in the baseline measure adjusted for the internal consistency ($SEM = SD \times \sqrt{1 - \alpha}$). Based on the SEM, the MDC ($MDC95 = SEM \times 1.96 \times \sqrt{2}$) was determined, which describes the amount of true change in subject status beyond measurement error with 95% certainty.

Validation results

Construct validity

The internal consistency of the 15 items was high (Cronbach alpha, 0.92). Pain has the least correlation with total score ($r = 0.84$),

Table 2
Mean and SD of the items and item total correlation

Item	Mean (SD)	Item total correlation
Pain at rest	2.8 (2.9)	0.55
Pain when doing a task with a repeated wrist/hand movement	5.4 (2.7)	0.56
Pain when lifting a heavy object	6.3 (2.6)	0.58
Pain is at its worst	7.4 (2.2)	0.57
How often do you have pain	5.1 (2.8)	0.55
Turn a key using my affected hand	4.4 (3.2)	0.76
Cut meat using a knife in my affected hand	4.8 (3.1)	0.65
Fasten buttons on my shirt	3.2 (3.4)	0.73
Use my affected hand to push up from a chair	5.5 (3.2)	0.61
Carry a 5 kg object in my affected hand	6.5 (2.7)	0.71
Use bathroom tissue with my affected hand ^a	3.1 (3.2)	0.68
Personal care activities (dressing, washing)	3.7 (3.1)	0.70
Household work (cleaning, maintenance)	4.9 (2.9)	0.67
Work	4.9 (2.9)	0.73
Recreational activities	3.5 (2.8)	0.65

SD = standard deviation.

^a Additional clarification wording for those who use water.

and specific activity had the most correlation with total score ($r = 0.94$).

High and significant correlations were found between the Persian version of PRWHE and DASH questionnaire indicating good construct and convergent validity of the PRWHE ($r = 0.8$; $P < .0001$). The highest correlation was in the section of usual activity of PRWHE with DASH ($r = 0.83$), and the least correlation belonged to pain in PRWHE and DASH ($r = 0.66$).

Reliability

About 74% of patients filled out and returned the Persian version of PRWHE 2 weeks after the initial examination.

The interclass correlation coefficient was 0.95 (confidence interval, 0.82–0.97; SEM, 4.5; and MDC₉₅, 12.5), indicating good reliability of the Persian version of PRWHE.

Item total correlation was more than 0.55 (range, 0.55–0.76). The least correlation belonged between 2 items of the pain section and total score, *pain at rest*, and *how often do you have pain* ($r = 0.55$). The most correlation was between the item *turn a key using my affected hand* (we modified instead of using the word doorknob) and the total score ($r = 0.76$) (Table 2). Findings indicate good reliability of Persian PRWHE.

Table 3
Comparison of measurement properties across translations

Measurement properties of PRWHE	Persian (present study)	Original ^a	Arabic	Italian
Cronbach alpha	0.92		0.96	0.96
Test-retest reliability	0.95	>0.90	0.8	
Construct validity, correlation to DASH	0.84		0.6	0.8
No. of patients	205	60	48	63

PRWHE = patient-rated wrist and hand evaluation; DASH = Disability of the Arm, Shoulder and Hand.

^a Taken from patient-rated wrist evaluation.⁸

Conclusion about result of cross-cultural translation

The Persian version of the PRWHE is valid and reliable in assessing pain and function in patients with wrist and hand injuries. Comparing the Persian and English versions of the PRWHE, the measurement properties were very similar as illustrated in Table 3.

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Quiz: # 645

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- # 1. The purpose of the undertaking was to
 - a. develop a Persian version of the PRWE
 - b. develop a Persian version of the PRWHE
 - c. give Iranian hand therapists a better understanding of complications of DRFx
 - d. demonstrate the similarity of Farsi to English in a medical setting
- # 2. The error of the measure was reported as
 - a. inconsequential
 - b. high
 - c. only a theoretical concern
 - d. the SEM
- # 3. The DASH was used to evaluate the
 - a. inter and intrarater reliability
 - b. clinical efficacy

- c. convergent and construct validity
 - d. impact on Iranian nationals practicing hand therapy in western countries
- # 4. The original PRWE was developed in
 - a. England
 - b. Canada
 - c. US
 - d. Cuba
- # 5. The translation to Persian was performed by a hand therapist and an epidemiologist both of whom spoke Persian as their primary language
 - a. true
 - b. false

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