Acta Orthopaedica et Traumatologica Turcica xxx (2017) 1–6

Contents lists available at ScienceDirect

Acta Orthopaedica et Traumatologica Turcica

journal homepage: https://www.elsevier.com/locate/aott

Evidence for reliability, validity and responsiveness of Turkish version of Hip Outcome Score☆

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ARTICLE INFO

Article history:
Received 5 October 2016
Received in revised form
19 March 2017
Accepted 15 May 2017
Available online xxx

Keywords:
Hip Outcome Score
Turkish
Clinometric
Outcome measurement
Translation
Hip arthroscopy

ABSTRACT

Background: Hip Outcome Score (HOS), originally developed in English, assesses the severity of hip pathology. To date, no Turkish version of the questionnaire exists.
Purpose: The aim of our study was to translate the HOS into Turkish and verify its psychometric properties.
Methods: The translation and cultural adaptation were performed according to international recommendations in five stages: The HOS was translated into Turkish, consistent with published methodological guidelines. The process included 2 forward translations, followed by the synthesis of these translations, and 2 backward translations, followed by an analysis of the translations and creation of the final version. The measurement properties of the Turkish HOS (internal consistency, construct validity, floor and ceiling effects and responsiveness) were tested in 130 patients.
Results: A committee consisting of the four translators agreed with the final version of the HOS (HOS-Tr). The internal consistency and the test-retest reliability of the HOS-Tr-ADL and HOS-Tr-S subscales were excellent. Correlations between the HOS-Tr and convergent validity of the with HHS and NAHS were fair to good. The responsiveness of the HOS-Tr-ADL and HOS-Tr-S subscales were 3.4 to 1.4 for patients treated with surgically and 0.9 to 1.1 for patients treated with non-surgically.
Conclusion: The HOS-Tr is understandable, reliably, valid, and responsive for Turkish-speaking patients with hip pathology.
Level of Evidence: Level 3 Diagnostic Study.
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Introduction

Patient-reported outcomes (PROs) provide insights from the patient's perspective of the impact of disease and are effective tools for the evaluation of the treatment results for surgeons. Many PROs have been developed for the evaluation of hip surgeries including Hip Outcome Score (HOS), Non-Arthritic Hip Score (NAHS), Oxford Hip Score (OHS), Hip Disability and Osteoarthritis Outcome (HOOS), Western Ontario and McMaster Universities Osteoarthritis Index, (WOMAC), International Hip Outcome Tool-33.[1–5] Of these, HOS was designed to measure not only the functional impairment of the patients in daily living (HOS-ADL) but also the functional impairment of the patients in sportive activities (HOS-S) including many specific movements that may push the limits of hip joint functions.[6–8]

Before using PROs in a society other than that in which the outcome measure was developed, it should be translated and culturally adapted. The PROs that have been translated into Turkish and psychometrically tested only include HHS, WOMAC, OHS and HOOS -Physical Function Short-Form.[9–13]

☆ Institutional Review Board has approved this study. (Istanbul University IRB (2016/255)).

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Peer review under responsibility of Turkish Association of Orthopaedics and Traumatology.

http://dx.doi.org/10.1016/j.aott.2017.05.001
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Please cite this article in press as: Polat G, et al., Evidence for reliability, validity and responsiveness of Turkish version of Hip Outcome Score, Acta Orthop Traumatol Turc (2017), http://dx.doi.org/10.1016/j.aott.2017.05.001

The aim of this study was to translate and adapt the HOS questionnaire into Turkish and to test the psychometric properties of the HOS in terms of reliability, validity, and responsiveness.

Materials and methods

Translation and cross-cultural adaptation

Translation and cross-cultural adaptation of the HOS was performed in 5 stages, consistent with the stages recommended by Beaton et al.[14] In the first stage, 2 Turkish individuals with a good command of English were responsible for the literal and conceptual translation of the HOS Form. The informed translator was a physical therapist, and the uninformed translator was a translator and interpreter both spoke Turkish as their mother tongue. In the second stage, both translations were compared and reviewed by a bilingual individual who highlighted any conceptual errors or inconsistencies in the translations to establish the first Turkish translation. In the third stage, after the first Turkish translation was agreed upon, 2 native English speakers with a good command of Turkish separately translated the finalized Turkish translation back into English. Both translators were unaware of the purpose of the study and had no access to the original English version. In the fourth stage, the back translated version of the HOS was compared to the initial English version of the HOS by a committee consisting of the four translators. After discussing the discrepancies, the committee finalized and approved the Turkish version of the HOS Form (HOS-Tr). In the final stage, preliminary testing was performed to determine comprehension of the Turkish version (Appendix).

Patients reported outcomes

HOS-ADL includes 19 questions that 17 of which are scored and was designed to measure the functional status during daily living activities. The second part of the questionnaire called HOS-S that includes 9 questions related with sports activities like running, jumping etc. The highest potential of HOS-ADL is 68 and HOS-S is 36. This value is then multiplied by 100 to get a percentage.[6] HHS is a well-known region specific outcome measure used by clinicians to measure pain, function and range of motion of the hip joint.[15] NAHS is also a disease specific outcome measure for hip joint that measures the pain and functional limitations during the last 48 h.[4]

Participants

This study was approved by the Institutional Review Board (2016/255) and an informed consent form was signed by all participants. The study was performed between January 2015 and December 2015. The eligibility criteria were (1) 18–60 years of age, (2) hip pathology including acetabular dysplasia, labral tears, FAI, tendon or muscle injuries, (3) patients who had treated surgically via hip arthroscopy (4) ability to read and write in Turkish. Patients who had Tonnis grade 3 and 4 degenerative arthritis, who had previous or additional lower extremity surgeries that may affect the functional evaluation, patients who did not perform any sports and who did not want to attend the study, were excluded. Diagnoses were established by 2 orthopedic surgeons. Age, gender, occupations, involved side and diagnosis of the participants were recorded.

One hundred thirty consecutive patients with a variety of hip disorders were invited to complete the HOS-Tr and the Turkish version of the HHS and NAHS. Subgroups of 30 patients were asked to complete the HOS-Tr again 7–14 days after their first completion to determine the test-retest reliability. To minimize the risk of short-term clinical change, no treatment was provided during this period. Responsiveness was assessed in 100 patients who were surgically treated and 30 patients who were treated non-surgically.

Preliminary testing

Preliminary testing was conducted on 30 of the 130 patients (11 males, mean age 32.8 ± 10.6 (range 21–54)) who fulfilled the eligibility criteria of the study to determine comprehension of the Turkish version. Following completion of the questionnaire by each patient, two researchers performed an interview in which the patients were asked if they had any difficulties understanding the questions. The questions that were difficult to understand were noted, and the patients were asked for their recommendations for revisions.

Statistical analysis

All statistical analyses were performed with the Statistical Package for the Social Sciences 20.0 (SPSS Inc, Chicago, IL, USA). The level of significance was set at $p \leq 0.05$. Descriptive statistics were calculated for all variables. These included frequency counts, the percentage for nominal variables, measures of central tendency (means and medians) and dispersion (standard deviations and ranges) for continuous variables. Before the statistical analysis, the Shapiro Wilk test was used to test for normal distribution of data. Dependent variables were compared using an analysis of variance for repeated measures. The measurement properties analyzed in this study for the instruments included internal consistency, the test-retest reliability, agreement, construct validity, ceiling and floor effects and responsiveness.

Internal consistency

Internal consistency was used to determine the interrelatedness among the items of the HOS-Tr. An inter-item correlation matrix was used to indicate whether one of the items did not correlate positively with the other items. A Cronbach alpha value ranging from 0.70 to 0.95 was considered to be adequate.[16] Data from the patients included in the first administration of the HOS-Tr were used to assess internal consistency.

Test-retest reliability

Test-retest reliability represents a scale's ability to yield consistent results when administered on separate occasions during a period when an individual's status has remained stable.[17] Intraclass correlation coefficients (ICCs) were calculated using a 2-way, mixed-model under consistency.

Agreement

Agreement was assessed with the standard error of measurement (SEM) and minimal detectable change (MDC). The ICC was used to calculate the SEM, which is an index of measurement precision. The SEM is calculated as the SD of the scores

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