

## Translation and Cultural Adaptation of the Oxford Hip Score for Iranian Population

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### ABSTRACT

**Introduction:** In recent years, outcome assessment related to orthopedic surgeries has increasingly focused on patient-reported questionnaires. The Oxford Hip Score (OHS), self-administered questionnaire, is a reliable, valid, and responsive instrument for assessing hip in patients undergoing Arthroplasty.

**Methods:** The study involved 105 adult Persian-speaking patients admitted for primary Total Hip Arthroplasty in two hospitals in Isfahan in Iran from September 2009 until April 2011. All of them filled out their scales (Persian OHS, WOMAC, and SF12) in preoperative examination.

**Results:** Mean scores of OHS in first administrations was  $42.7 \pm 12.7$ . The Persian OHS overall score demonstrated high reproducibility (ICC, 0.93,  $P < 0.001$ ) and internal consistency (CA, 0.94). Persian OHS had high correlations with WOMAC total score ( $r = 0.86$ ), function score ( $r = 0.86$ ), and pain score ( $r = 0.79$ ), the relationship between the Persian OHS and the WOMAC stiffness subscale was somewhat lower ( $r = 0.69$ ). The correlation coefficient between the Persian OHS and the PCS of the SF-12 in our study was moderate ( $r = 0.58$ ). Persian OHS had low correlation with MCS of the SF-12 ( $r = 0.40$ ).

**Discussion:** Persian OHS had high correlations with WOMAC total score, function score, and pain score. It had moderate correlation with PCS of the SF-12 and low correlation with MCS of the SF-12.

**Conclusions:** Our study demonstrated the trans-cultural adaptation and validation of the Persian OHS is a reliable and practicable instrument for assessment of function and pain in Iranian patients with hip osteoarthritis.

**Keywords:** Hip, Oxford hip score, persian, quality of life, reliability, total hip arthroplasty, validity

### INTRODUCTION

Total Hip Replacement is one of the most successful orthopedic surgeries.<sup>[1,2]</sup> Annually, about 800 000 Total Hip Replacement is done around the world.<sup>[3]</sup> Unfortunately, this number is increasing, because prevalence osteoarthritis of hip joint is increasing around the world including Iran.<sup>[3,4]</sup>

Quality of life is personal idea and is determined by

oneself.<sup>[5]</sup> To determine quality of life, general and specific instruments exist for each disease. General instruments like Short-Form 36 Health Survey (SF-36) evaluate situation of person broadly.<sup>[6]</sup> On the other hand, specific instruments for each disease have created to focus on those aspects of life that are affected by a particular disease; also, we can utilize these tools to evaluate the effectiveness of various treatments.<sup>[7]</sup> In recent years, the outcome of orthopedic surgeries has increasingly been evaluated according to patient-reported questionnaires.<sup>[8]</sup> So, self-report questionnaires should be used to achieve more information on patients' situations.<sup>[9]</sup> Self-report questionnaires generally should not include many questions so that the response rate is increased and the risk of data loss is decreased. They also should be valid, reliable, and sensitive to clinical changes.<sup>[8]</sup> The questionnaires should be adapted cross-culturally to maintain the content and construct validity of the original instrument and to prevent population-related and culture-related bias in assessment.<sup>[10]</sup>

The Oxford Hip Score (OHS), which is a self-administered questionnaire, has been studied extensively and is a reliable, valid, and responsive instrument for evaluating hip pain and disability in patients suffering from osteoarthritis of hip joint, especially those undergoing Total Hip Arthroplasty.<sup>[11-16]</sup> It is a 12-item instrument with each item scored by the patient on a 1- to 5-point Likert scale.<sup>[11]</sup> The global score is given by the sum of the scores for all 12 items resulting in values between 12 and 60. The higher the score, the worse the health state is.

## METHODS

Permission was obtained from the original questionnaire developer and the technology transfer company of the University of Oxford (Oxford, England) to develop this study. We followed the recommended process of the Mapi Research Trust<sup>[17]</sup> as well as the principles ordered by the Translation and Cultural Adaptation working group.<sup>[18]</sup> The standard forward-backward translation (Linguistic validation) was done; two health professionals (orthopedic surgeons) did the forward translation (English to Persian) independently. After receiving forward translations of the OHS questionnaire from our translators,

we decided to arrange meetings with two forward translators and an orthopedic surgeon to integrate the contents of the translations. So, we made the opportunity for them to meet each other and we had a discussion on translations. The session was actually a peaceful settlement about the differences existed between the translations of each of the two translators. We matched their translations and they tried to convince each other for choosing the most suitable word for each case. We had finally a single matched and revised questionnaire in Persian. We did the exact things for the backward translations (Persian to English) as well.

For the next step, in a common meeting in the presence of all four translators and orthopedic surgeon, the original questionnaire of OHS was shown and the backward translated questionnaire was compared with the original one. We have sent differences we found between our backward translated questionnaire and the original OHS questionnaire to the original questionnaire developer accompanying with the backward translators' explanations for each case of difference. At the end, we established the pre final Persian version of OHS.

After translation process, the Persian version of the OHS was tested in a pilot study by administering to 30 adult patients suffering from osteoarthritis of hip joint (30 adult inpatients admitted for hip replacement in Alzahra and Kashani hospitals) for "cognitive debriefing" and to two orthopedic surgeons for "clinician's review."<sup>[17]</sup> According to the results of the pilot study and feedbacks from the developer, the questionnaire was edited more and the final Persian version of the OHS was produced.

The study involved 130 adult Persian-speaking patients suffering osteoarthritis of hip joint admitted for primary Total Hip Arthroplasty in two university hospitals (Alzahra and Kashani hospitals) in Isfahan in Iran from September 2009 until April 2011. Of these 130 patients, 25 were excluded, five patients did not accept to participate in the study, 15 patients underwent other operative procedures, and five persons were not operated on during the study period. Thus, preoperative data were available for 105 patients with hip osteoarthritis. All of them filled out Persian OHS, WOMAC, and SF12 in preoperative examination two weeks before their surgery. Retest was performed on 39 patients two weeks later, when they were admitted for surgery. Access to

those hospitals was open to every patient, and our routine patients are a mixture of urban and rural inhabitants from different states of Iran.

We used Cronbach's alpha and intra-class correlation coefficient (ICC), Bland and Altman method, respectively, to evaluate the internal consistency and reproducibility of data from the Persian OHS.<sup>[19]</sup> Cronbach's alpha indicates the average correlation between all items of a scale and the correlation between each item and the whole scale. We anticipated Cronbach's alpha values greater than 0.9 and 0.8, which were considered excellent and good, respectively. To analyze the discriminant and convergent validity, the Persian OHS was correlated to the Persian version of Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)<sup>[4,20]</sup> and the Persian version of 12-item Short Form Health Survey (SF-12).<sup>[21]</sup>

The OHS is a 12-item instrument with each item scored by the patient on a 1-to 5-point Likert scale.<sup>[11]</sup> The global score is generated by summing the scores for all 12 items resulting in values between 12 and 60. The higher the score, the worse is the health state. The distribution of floor and ceiling effects of the Persian OHS was determined by calculating the proportion of individuals obtaining the lowest<sup>[12]</sup> and highest<sup>[60]</sup> scores, respectively.<sup>[22]</sup> Only fully completed questionnaires were used for the analysis.

The WOMAC is a self-administered, disease-specific instrument that includes subscales for pain, stiffness, and physical function.<sup>[23,24]</sup> The original global score is given by summation of the scores for each subscale. Scores range from 0 to 20 (pain), 0 to 8 (stiffness), and 0 to 68 (function). The higher the score, the worse is the health state. The SF-12 is a self-administered generic measure for evaluating the quality of life.<sup>[25,26]</sup> Scores are transformed into two weighted summary scores for physical function (Physical Component Scale [PCS]) and mental health (Mental Component Scale [MCS]) which can score between 0 and 100.<sup>[25,26]</sup> The higher the score, the better is the health state. We recoded the scores of OHS and WOMAC into a 0 to 100 point scale with 100 being the best score. The Persian WOMAC and SF12 were recorded in preoperative examination two weeks before their surgery accompanying the OHS. To examine convergent validity, we assumed that the correlation coefficients describing the relationship

between the OHS and the WOMAC and the PCS of the SF-12 would be moderate to high ( $r > 0.50$ ). To examine divergent validity, we anticipated the correlation coefficients describing the relationship between the OHS and the MCS of the SF-12 which would be lower than those between the OHS and PCS ( $r < 0.50$ ).

The SPSS for Windows, Version 16.0 (Inc., Chicago), was used for statistical analyses. Pearson correlation was also applied to assess the validity of the Persian OHS with respect to the WOMAC and SF12.

## RESULTS

The Persian OHS was completed by 105 patients. Mean age was  $67.8 \pm 7.0$  years, 61.6% were females. There were no major problems in linguistic validation of OHS. Most discrepancies concerned synonyms for specific expressions, for example, the translators have written "the pain of your hip" instead of "the pain from your hip," or have used the words "sharp and burning" instead of the words "shooting and stabbing." Similarly, the phrase "walking stick" has been used instead of "walking aid." We found no floor or ceiling effects for the Persian OHS that were determined by calculating the proportion of respectively. There was no specific question that consistently was left unanswered. No items had more than 5% missing data. The Persian OHS overall score demonstrated high reproducibility (ICC, 0.93,  $P < 0.001$ ) and internal consistency (Cronbach's alpha, 0.94). Mean scores for the first and second administrations were similar ( $P = 0.83$ ) ( $42.7 \pm 12.7$  vs  $41.4 \pm 13.9$ , respectively). Convergent validity for the Persian OHS was observed by the moderate to high correlations between Persian OHS scores and the other questionnaire scores [Table 1]. The strongest correlations were between the Persian OHS and the WOMAC total score ( $r = 0.86$ ), the Persian OHS and the WOMAC function score ( $r = 0.86$ ), and then between Persian OHS and the WOMAC pain ( $r = 0.79$ ). Divergent validity for the Persian OHS was observed by the low correlation between the Persian OHS and the MCS of the SF-12 ( $r = 0.40$ ).

## DISCUSSION

Our study presents the results of the trans-cultural adaptation and validation of the OHS for Iranian

**Table 1:** Mean score values and  $r$ =correlation coefficients

Outcome measure	Score values (mean±sd)	Persian OHS (r)	P value
Oxford hip score	42.7±12.7	-	-
WOMAC total	54.9±17.9	0.86	<0.001
WOMAC function	52.7±29.5	0.86	<0.001
WOMAC stiffness	50.8±24.4	0.69	<0.001
WOMAC pain	53.7±21.4	0.79	<0.001
SF-12 (PCS)	36.0±9.7	0.58	<0.001
SF-12 (MCS)	51.7±11.9	0.40	0.001

OHS=Oxford hip score, PCS=Physical component scale, MCS=Mental component scale

patients with Persian language, who suffered from hip osteoarthritis. According to the results, items on the Persian OHS were well understood by Iranian patients with hip osteoarthritis demonstrating that the translation process was acceptable. The OHS has been evaluated extensively and is a reliable, valid, and responsive instrument for assessing hip pain and disability in patients undergoing Total Hip Arthroplasty.<sup>[11,12,14,16]</sup> Unlike the studies of Wood and McLauchlan<sup>[27]</sup> and McMurray *et al.*,<sup>[28]</sup> none of the questions were consistently left unanswered in our study. We observed no floor or ceiling effects for the Persian OHS, similar to the findings for preoperative patients reported by Garbuz *et al.*<sup>[29]</sup>

The Persian OHS overall score demonstrated high reproducibility (ICC, 0.93,  $P < 0.001$ ) and internal consistency (Cronbach's alpha, 0.94). We found good internal consistency for the Persian OHS more than the value reported by Dawson *et al.* (0.84).<sup>[11]</sup>

Convergent validity for the Persian OHS was observed by the high correlations between Persian OHS and the WOMAC total score ( $r = 0.86$ ) and the WOMAC function score ( $r = 0.86$ ) and then between Persian OHS and the WOMAC pain ( $r = 0.79$ ). This confirms previous findings for the original version of the OHS.<sup>[15,29]</sup> Correlation coefficients between OHS and WOMAC pain and function subscales were 0.76 and 0.88 in a cohort study of 147 patients with a mean age of 68 years.<sup>[15]</sup> The correlation coefficients were also ( $r = 0.81-0.87$ ) in a prospective cohort study on 402 patients (mean age, 61 years) of (29). We observed that the correlation coefficient describing the relationship between the Persian OHS and the WOMAC stiffness subscale was somewhat lower ( $r = 0.69$ ), which was consistent with those of Ostendorf *et al.* ( $r = 0.63$ )<sup>[15]</sup> and

Garbuz *et al.* ( $r = 0.57$ ).<sup>[29]</sup> Divergent validity for the Persian OHS was observed by the low correlations between the Persian OHS and the MCS of the SF-12 ( $r = 0.40$ ), which was slightly lower than the values of Ostendorf *et al.* ( $r = -0.49$ )<sup>[15]</sup> and Garbuz *et al.* ( $r = -0.49$ ).<sup>[29]</sup> Similar to the values reported by Ostendorf *et al.* and Garbuz *et al.* ( $r = -0.53$ ;  $r = -0.60$ ),<sup>[15,29]</sup> the correlation coefficient between the Persian OHS and the PCS of the SF-12 in our study was moderate ( $r = 0.58$ ).

In our patient samples, when using the original scoring system, mean score for the first administrations was 42.7, similar to the mean preoperative OHS score reported by Dawson *et al.*, which was 43.6;<sup>[11]</sup> Field *et al.* reported a mean preoperative value of 41.0<sup>[12]</sup> and Ostendorf *et al.* reported a value of 42.5 for Dutch patients.<sup>[15]</sup>

## CONCLUSIONS

Our study demonstrated that the trans-cultural adaptation and validation of the Persian OHS is a reliable and practicable instrument for self-assessment of function and pain in Iranian patients with hip osteoarthritis. We performed this validation in patients with hip osteoarthritis who underwent THA. We believe further investigation of the Persian OHS in patients after THA is needed to assess the sensitivity to change of this questionnaire.

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