Oxford Shoulder Score: A Cross-Cultural Adaptation and Validation Study of the Persian Version in Iran

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Abstract

Background: Oxford shoulder score is a specific 12-item patient-reported tool for evaluation of patients with inflammatory and degenerative disorders of the shoulder. Since its introduction, it has been translated and culturally adapted in some Western and Eastern countries. The aim of this study was to translate the Oxford Shoulder Score (OSS) in Persian and to test its validity and reliability in Persian speaking population in Iran.

Methods: One hundred patients with degenerative or inflammatory shoulder problem participated in the survey in 2012. All patients completed the Persian version of OSS, Persian DASH and the SF-36 for testing validity. Randomly, 37 patients filled out the Persian OSS again three days after the initial visit to assess the reliability of the questionnaire.

Results: Cronbach's alpha coefficient was 0.93. The intraclass correlation coefficient was 0.93. In terms of validity, there was a significant correlation between the Persian OSS and DASH and SF-36 scores (P < 0.001).

Conclusion: The Persian version of the OSS proved to be a valid, reliable, and reproducible tool as demonstrated by high Cronbach's alpha and Pearson's correlation coefficients. The Persian transcript of OSS is administrable to Persian speaking patients with shoulder condition and it is understandable by them.

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Introduction

Shoulder pain and disability are common chief complains presenting in current orthopedic practices. Shoulder pain is reported to be the third most frequent musculoskeletal symptom after low back and neck pain. In addition, shoulder pain is common in patients with degenerative or inflammatory disorders with 7% prevalence in the population. [1-3]

Current literature shows that in the operative management of shoulder disorders, including arthroscopic shoulder procedures for rotator cuff, instability, adhesive capsulitis, biceps tendon disease, subacromion impingement and glenohumeral joint replacement, patient-reported shoulder specific clinical measures are being used widely. This indicates the importance of patients' opinions regarding their health status and quality of life related

to their presenting disease in order to assess treatment efficacy.

With recent trends toward multicentre, multidisciplinary, regional and international clinical studies, systemic reviews and meta-analysis, the standardization, validation and cultural adaptation of a patient-reported shoulder clinical outcome instrument is felt more than ever. Among these patient-based instruments, the Oxford Shoulder Score (OSS) is the only one that covers, not only shoulder pain frequency and severity, but also quality of life and activity of daily living affected by shoulder illness.

The OSS is a simple questionnaire that includes the perception of patients concerning their shoulder and related quality of daily activities; moreover, it is easy to administer by untrained people. This clinical measure, as a joint specific instrument, minimizes the influence of other simultaneous morbidities in the upper limb and has been reported as valid and reliable for degenerative and inflammatory disorders of the shoulder in many global studies.

Presently, there is not a shoulder-related quality of life assessment available for the Persian speaking population who live in Iran, Afghanistan, and Tajikistan. Hence, the purpose of this current study was to translate and culturally adapt the OSS in the Persian speaking population in Iran and consequently to evaluate its psychometric properties, reliability, and validity.

Material and Methods

Patients

The study included 100 consecutive patients referred to the shoulder clinic from January to August 2012. The inclusion criteria were having an inflammatory or degenerative shoulder disorder, and being a native literate Persian speaker. The exclusion criteria were patients with neuropathic pain, neoplasm, systemic inflammatory disease, and shoulder instability. The Internal Review Board (IRB) of Mashhad University of Medical Sciences has approved the protocol. Patients were consented before filling the questionnaire.

Translation

The original English OSS was developed by Dawson et al. and subsequently translated according to the guidelines and recommendations in the related literature. [4-6] Translators of the Persian version, included two Iranian orthopedic surgeons and an independent professional translator whose mother language was Persian. A coordination meeting was held

and a common version of the Persian translation for the OSS was produced. We sent this Persian translated draft to an English-Persian translator, whose mother tongue was American English, to translate this Persian version to English. She was not aware of the study details and had not seen the English transcript of the OSS. Next, a second meeting of the translators was held and we compared the original English version and backward translated transcript. There was not a remarkable difference between the two. Finally, a consensus was reached for a final version of the Persian OSS (Figure 1).

The Oxford Shoulder Score (OSS)

The OSS was first developed by Dawson et al. in 1996.[7] It is a patient reported questionnaire including 12 descriptors of pain and disability for shoulder ailments. Item rating ranges from 1 to 5 and the total score is from the summation of all 12 rated items from 12 (the best) to 60 (the worst).

Disabilities of the Arm Shoulder and Hand (DASH) Outcome Measure

The DASH (disabilities of the arm, shoulder and hand) outcome measure is a 30-item, self-report questionnaire designed to measure physical function and symptoms in patients with musculoskeletal disorders of the upper limbs. [8] The questionnaire was designed to describe the disability experienced by people with upper-limb disorders and to monitor changes in symptoms and function over time following treatments. [9] It is a reliable instrument for clinicians and clinical researchers that can be used to assess any or all joints in the upper extremity. [10,11] Furthermore, the DASH has been tested and approved in terms of construct validity and internal reliability in the Persian language by Mousavi et al. [12]

The SF-36

The SF-36 is a generic, short-form health survey with only 36 questions that includes an 8-scale profile of functional health and well-being scores as well as psychometrically-based physical and mental health summary measures. The SF-36 has proven useful in surveys of general and specific populations, comparing the relative burden of diseases, and in differentiating the health benefits produced by a wide range of different treatments. [13] Among the most frequently used conditions are chronic musculoskeletal conditions, including osteoarthritis, back pain, and knee and shoulder disorders. [14-16] Moreover, its validity and reliability has been documented in many countries including Iran. [17]

Figure 1: Persian version of Oxford Shoulder Score that is validated for Persian speaking population.

Psychometric Analysis

Construct Validity

Construct validity involves empirical and theoretical support for the interpretation of the construct of the clinical instrument. Convergent validity is testing the ratio of correlation between a new measure and other related measures, which are supposed to be correlated in a same field. In this study, we have used the already approved valid Persian DASH and Persian SF-36 survey to test the validity of the OSS. We assessed the statistical validity by calculating the Pearson correlation coefficient between OSS, DASH and SF-36.

Reliability

Reliability refers to the consistency of a measure; hence, a test is considered reliable if we could get the same result repeatedly. In our study, to measure test-retest reliability or reproducibility, the Persian OSS was administered twice at two different times. This kind of reliability is used to assess the consistency of a test across time. This type of reliability assumes that there will be no change in the quality or construct being measured. For this purpose, we randomly asked 37 participants to fill out the Persian OSS three days after the main study. Meanwhile, this retest portion of the patients did not receive major treatment such as surgery that may change their quality of health and symptoms substantially.

Internal Consistency

Internal consistency is a part of reliability testing that tests the consistency of the ratings across items in a same measure. In other words, we are comparing question items that measure the same construct to determine that the tests are internally consistent. Internal consistency was tested by means of the Cronbach's alpha coefficient that calculates the internal correlations of all the items on the same scale (the Persian OSS). The Cronbach's alpha coefficient indirectly evaluates the extent to which all of the 12 questions of the OSS measure the same construct. A high Cronbach's alpha coefficient (range from 0 to 1) indicates more consistency.

The Cronbach's alpha coefficient was also calculated for the elimination of 1 item out of the 12 questions. All question items were tested for correlation with the overall OSS. Statistical analyses were performed using SPSS 11.5 software (SPSS Inc, Chicago, IL). The value of $P < 0.05$ was considered a significant difference.

Results

In the translation and cultural adaptation of the OSS to Persian, there was not a major problem. A total of 100 patients, who met the inclusion criteria for the study, filled out the Persian OSS, DASH and the SF-36 consequently. The range of the patients` age was between 25 to 77 years with an average of 43 Table 1. The average time required for patients to complete the OSS form was 4 minutes and 40 seconds (range: 2-15 min).

Reliability: Internal Consistency and Cronbach's Alpha

For each item, test-retest assessment was performed with both of the ICCs and their internal

Table 1: Demographic characteristics of the patients with shoulder problems (N=100)

Age, mean (SD)	43 (15)
Gender, no. (%)	
Male	49 (49)
Female	51 (51)
Education, no. (%)	
Below high school	72 (72)
High school and up	28 (28)
Clinical diagnosis, no. (%)	
Subacromion Bursitis/ impingement without RCT	24 (24)
Rotator cuff tear (RCT)	23 (23)
Biceps tenosynovitis	11 (11)
Frozen shoulder	30 (30
Shoulder DJD	5 (5)
ACJ DJD	7 (7)
Side involved, no. (%)	
Dominant limb	52 (52)
Non-dominant limb	30 (30)
Bilateral limbs	18 (18)

consistency was high (Cronbach's alpha = 0.93). The intraclass coefficient was 0.93 (95% confidence interval; range = 0.90-0.96).

Reproducibility

Thirty-seven patients once again filled out the Persian OSS 48 h later in order to test the test-retest reliability. The Pearson correlation was 0.86 (*P* < 0.001) (Table 2).

Validity

In terms of construct validity, the Persian OSS revealed a good convergent validity with the individual scores of DASH (*P* < 0.001). In addition, we compared the total average of the OSS scores with the eight dimensions of the SF-36 scores. There was a significant correlation (P = 0.025) between the Persian OSS to the domains of PF, RP, BP, SF, and PCS and insignificant correlation to the domains of GH, VT, and MH (Table 3).

Discussion

Shoulder pain and discomfort account for 7-25% of the general population. [18] In a study conducted by WHO-ILAR COPCORD on the prevalence of musculoskeletal complaints in a rural area in Iran, the shoulder was reported as the second most common and was as high as 22.7%. [19] As a result, modern shoulder surgery, arthroscopic sport medicine shoulder surgery, and joint replacement have drawn the attention of orthopedic surgeons in the recent two decades. Moreover, with the current trend

toward multicenter studies and international meta-analysis, the need for the standardization of clinical measures has been felt more than before.

In shoulder medicine and surgery, it has been reported that clinical instruments are responsive, reproducible, reliable, and comprehensive. [20-22] The OSS is a short questionnaire that consists of 12 items. It covers both general health related to shoulder impairment and specific questions on shoulder pain and function. The context of the questions is easy, simple, and comprehensible for patients; hence, explanatory instructions are not needed for independent usage by the patient. Although the OSS was first introduced for prospective studies, Wilson et al. recently reported that it is valid for retrospective application such as shoulder acute trauma wherein a prospective measurement is not possible. [23] Younis et al. recently studied the range of the OSS in the asymptomatic population in the UK,[24] the benefit of the study is that disease severity can be gauged in relation to the normal population of the index community and post-operative improvements can be predicted more accurately.

The OSS was presented by Dawson et al. as a disease specific patient-based questionnaire to evaluate inflammatory and degenerative disorders of the shoulder in 1996.[7] Since then, it has been widely used in the clinical assessment results of both operative and conservative treatments. It has been validated in several languages and cultures, including French, Turkish, German, Dutch, Italian, and Korean. [25-30] However, to date, there is not a Persian transcript of the OSS available with psychometric properties testing.

Different static measurements have been reported to examine the agreement and reliability of the questionnaires. In our study, the Cronbach`s alpha coefficient of 0.93 and the intraclass coefficients of each score of the OSS ranged from 0.90 to 0.96, being an excellent value for the Persian OSS to show reliability, which confirms a high internal consistency of the Persian OSS. The Pearson correlation between test and retest was calculated as -0.86. Persian version of the OSS has sufficient agreement and reliability when compared with the original and other culturally adapted versions (Figure 2).

In terms of construct validity, which is an important index for achieving a comprehensive a clinical score, we have calculated the Pearson`s correlation between the total score achieved by the Persian OSS to the 8 dimensions of the Persian SF-36 as well as the Persian DASH, which was simultaneously filled out by our

Table 2: Correlation of OSS questions with each other (N=100)

Indices	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Q1											
r	0.21	0.20	0.27	0.20	0.23	0.18	0.63	0.25	0.20	0.30	0.5
$P*$	0.039	0.046	0.0060	0.044	0.024	0.079	<0.001	0.014	0.047	0.0030	<0.001
Q2											
r	-	0.57	0.42	0.48	0.45	0.53	0.26	0.55	0.56	0.33	0.35
$P*$		<0.001	<0.001	<0.001	<0.001	<0.001	0.010	<0.001	<0.001	0.0010	<0.001
Q3											
r		-	0.54	0.51	0.57	0.55	0.27	0.58	0.64	0.41	0.34
$P*$			<0.001	<0.001	<0.001	<0.001	0.0060	<0.001	<0.001	<0.001	<0.001
Q4											
r			-	0.51	0.58	0.47	0.31	0.45	0.46	0.42	0.32
$P*$				<0.001	<0.001	<0.001	0.0020	<0.001	<0.001	<0.001	0.0010
Q5											
r				-	0.74	0.43	0.20	0.53	0.50	0.44	0.29
$P*$					<0.001	<0.001	0.042	<0.001	<0.001	<0.001	0.0040
Q6											
r					-	0.58	0.34	0.60	0.56	0.55	0.39
$P*$						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Q7											
r						-	0.34	0.83	0.70	0.55	0.39
$P*$							0.0010	<0.001	<0.001	<0.001	<0.001
Q8											
r							-	0.38	0.28	0.44	0.50
$P*$								<0.001	0.0040	<0.001	<0.001
Q9											
r								-	0.67	0.46	0.44
$P*$									<0.001	<0.001	<0.001
Q10											
r									-	0.53	0.43
$P*$										<0.001	<0.001
Q11											
r										-	0.36
$P*$											<0.001

*Correlation is significant at the 0.05 level (2-tailed).

Table 3: Validity expressed by Pearson correlation between the Persian OSS and DASH and SF-36 (N=100)

Indices	Dash-work	Dash-music	PF	RP	BP	GH	VT	SF	RE	MH	PCS	MCS
OSS												
r	−0.59	−0.49	0.48	0.43	0.63	0.13	0.20	0.35	0.22	0.13	0.55	0.12
P	<0.001	<0.001	<0.001	<0.001	<0.001	0.21	0.052	<0.001	0.025	0.21	<0.001	0.23

OSS: Oxford shoulder score, DASH: Disabilities of the arm shoulder and hand, PF: Physical functioning, RP: Role-physical, BP: Bodily pain, GH=General health, VT: Vitality, SF: Social functioning, RE: Role emotional, MH: Mental health, PCS: Physical component summary, MCS: Mental component summary

patients. There was a significant Pearson`s correlation coefficient between the total Persian OSS to PF, RP, BP, SF, PCS domains and insignificant correlation to GH, VT, MH domains. In addition, the Persian OSS revealed a good convergent validity with the individual scores of DASH. Pearson`s correlation for validity testing in other versions of the OSS was calculated in relation with the SF-36 and DASH.

The strength of our study is that we have included two generic health related quality of life measures; the SF-36 and DASH, which generally express mental and general health conditions, vitality, and social functioning of the patient and these two, were used to test the construct validity of the Persian OSS. The limitation of our study was the diversity of cultures and Persian accents among the patients because they were referred to a level-I hospital.
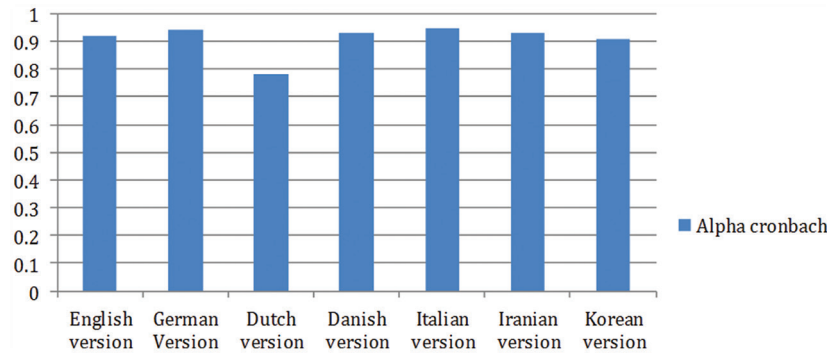
Figure 2: Cronbach's alpha of the original and other culturally adapted versions are illustrated in the diagram.

Conclusion

This study indicates that our Persian transcript of the Oxford Shoulder Score is as valid version to be applied among the Iranian population.

Conflict of Interest: None declared.

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