

Research Article

A Cross-Cultural Adaptation of the Oxford Shoulder Score: The Arabic Version

Aliaa Fareed Khaja*, Hanna S, Bouhamra A and Maqdes A

Department of Trauma and Orthopedics, Al Razi Orthopedic Hospital, Kuwait City, Kuwait

*Corresponding author: Aliaa Fareed Khaja, Department of Trauma and Orthopedics, Al Razi Orthopedic Hospital, Kuwait City, Kuwait; **Phone:** +96566135777

Received: July 18, 2020; **Accepted:** July 28, 2020; **Published:** July 31, 2020

Abstract

Purpose: The Oxford Shoulder Score (OSS) is a widely used Patient-related Outcome tool used to assess patients with shoulder pain. The aim of this study was the translation and cultural adaptation of the Arabic version of the Oxford Shoulder Score as well as proving the reliability and validity of the score.

Methods: One hundred and fifty patients participated in this survey. The internal consistency tests were performed using Cronbach's alpha. Test-retest reliability (intra-correlation coefficient), convergent construct validity, convergent validity, floor and ceiling effects and responsiveness were also calculated.

Results: Cronbach's alpha coefficient was 0.95. The Intra-Class Correlation Coefficient (ICC) was 0.95. Regarding examining the validity of the Arabic version of OSS, there was a significant correlation between the Arabic OSS and the previously published Arabic version of the Disabilities of the Arm, Shoulder and Hand Score (DASH Score) ($p < 0.001$).

Conclusion: Overall, Arabic version of OSS proved to be a good diagnostic tool for patients with shoulder pain.

Keywords: Oxford shoulder score; Shoulder pain; Reliability; Validation; Arabic

Abbreviations: OSS: Oxford Shoulder Score; ICC: Intra-Class Correlation Coefficient; DASH: Disabilities of the Arm, Shoulder and Hand Score

Introduction

Shoulder pain is a common problem, and a significant one at that. Its prevalence is estimated to be around 7% of the population, increasing to over 20% in people above 70 years of age [1-6]. Shoulder pain originates from peri-articular soft tissue disorders, mostly the rotator cuff [5,6]. Shoulder pain contributes to most visits to GPs, and even hospital specialists [7-10]. Surgery may be required by some patients, resulting in socio-economic implications due to morbidity and loss of productive hours [11].

It is very important that surgeons document the outcome from their practice for audit purposes; but then the major problem has been the lack of appropriate assessment records [12]. Many scoring methods have been developed over time to evaluate the outcome of orthopedic management of shoulder conditions. However, they are derived from radiological and clinical data and depend on the surgeon's judgement [13,14]. It is becoming more apparent that most clinical assessments of major aspects of outcome are usually not reproducible and are inaccurate [15,16]. Also, there may be differences in the priorities and concerns of both the surgeon and his or her patient [17]. There is a need for methods which will elicit the perception of the patient's outcome [18]. This has raised interests in patient-based assessments.

Studies have shown that patient reports can be valid, reliable, and sensitive to clinical change [19]. Evidence from research suggests that questionnaires issued to patients could be useful for clinical assessment in disorders of the shoulder [12]. In the event that a questionnaire is used, it should be practical, short, reliable, valid, and sensitive to clinical alterations and changes. The Oxford Shoulder Score (OSS) was first developed by Dawson et al. in 1996 [12]. The questionnaire is reported by patients, which includes 12 descriptors of pain and disability for shoulder ailments. The score of each descriptor ranges from 1 to 5, and the total score is calculated by adding the score of all 12 rated items from 12 (No pain) to 60 (highest level of Pain/Disability).

It encompasses general health questions, and questions specific to shoulder function and shoulder pain. The questions in the OSS are set in an easy context. Questions set are simple, and easily comprehended by patients; and so, patients do not need an explanatory instruction for independent usage. Although the Oxford shoulder score was initially used for prospective studies, a report by Wilson et al., suggested that it could as well be useful for retrospective application, for instance in acute trauma of the shoulder where it is not possible to take a prospective measurement [20]. A recent study of the range of Oxford Shoulder Score in the UK's asymptomatic population showed that one of the major benefits of the study is the ability to gauge disease severity with respect to the index community's normal population [21]. Another merit is the more accurate prediction of post-operative improvements.

Patient reported outcome scores have proven important in the medical field, providing informative and comparative subjective evidence that is quantified to help aid the medical practitioners when evaluating a patient's health [7,22,23]. The difficulty of using such scores is due to the language restrictions of these scores as not all of them are provided for our regional language: Arabic. It would be beneficial to have the scores translated into Arabic to be used for patients who speak Arabic and do not extensively comprehend English. This will in turn enhance the ability for our physicians to better understand the population needs [23]. The Oxford Shoulder Score is very helpful in assessing patients with shoulder pain post-operatively [20,21,24].

The process of translating such scores and proving their effectiveness is lengthy yet extremely beneficial. They must follow specific guidelines ensuring linguistic integrity without the loss of the context [23].

The aim of this study was the translation and cultural adaptation of the Arabic version of the Oxford Shoulder Score as well as proving the reliability and validity of the score.

Methods and Materials

Patient Selection

One hundred and fifty patients participated in the survey. All were consecutive patients referred to the shoulder clinic between January to July 2019. The Protocol was approved by The Kuwaiti Ministry of Health Ethical Committee (2019/1068). We received the patient's consent before filling the questionnaire.

Translation

Dawson et al. developed the original Oxford Shoulder Score in English, and had it translated based on the recommendations and guidelines in the literature [25-27]. Two bilingual orthopedic surgeons and one independent professional translator were involved in translation of the Arabic version. The authors held a coordination meeting which resulted in the production of a common version of the Arabic translation for the OES. Independent Arabic linguistics expert approved final draft. The questionnaire was distributed to a pilot of 11 patients to test the ease of language and understanding of the questions. No complaints were reported.

The Oxford Shoulder Score (OSS)

The OSS was first developed by Dawson et al. in 1996 [6]. The questionnaire was reported by patients and included 12 descriptors of pain and disability for shoulder ailments. The score of each descriptor ranges from 1 to 5, and the total score is calculated by adding the score of all 12 rated items from 12 (No pain) to 60 (highest level of Pain/Disability).

Disabilities of the Arm Shoulder and Hand (DASH)

The DASH Score consists of 30 items, which are reported by patients and designed to measure physical function and symptoms in patients with musculoskeletal disorders of the upper limbs [6]. The purpose of DASH Score is to describe the disability experienced

by people with upper limb disorders and to monitor changes in symptoms and function over time following treatments [28]. It proved to be a reliable tool for physicians to investigate the joints in the upper extremity. The score of each item ranges from 1 to 5, and the total score is calculated by adding the score of all 30 rated items from 30 (No disability) to 150 (highest level of Disability).

To our current knowledge, the Arabic DASH (Alotaibi, 2010) score is the only relevant and available Arabic score. Therefore, it was used for testing the construct validity of the Arabic OSS.

Statistical Analysis

Internal Consistency

We evaluated the internal consistency by calculating the Cronbach's alpha. The literature states that $\alpha > 0.70$ is acceptable, while 0.95 should be the maximum to avoid redundancy [29]. Content validity was measured by examining the shape of data distribution, as well as floor and ceiling effects. Floor effect is the percentage of patients who scored the lowest possible score (score of 30), and ceiling effect is the percentage of those with the highest score (score of 150). If more than 30% of the respondents had a floor or ceiling effect, the effects would be considered to be relevant.

Reliability

In order to estimate the reliability of the questionnaire, Cronbach's alpha was calculated. Since every patient completed the survey on two different occasions. The patients were asked to take the questionnaire a second time after 15 days from the initial test. To test the interobserver reliability, the Cronbach's alpha was calculated for each of the three test situations. Also, ICC (interclass correlation coefficient) was used to assess test-retest reliability.

Construct Validity

Spearman's correlation coefficient between the OSS and DASH Score was calculated to test convergent validity of the OSS. Since the DASH Score has already been validated in Arabic speaking countries, higher correlation coefficient would prove convergent validity of the OSS.

Results

There have been 150 patients who have completed the OSS and DASH Outcome Score questionnaire and agreed to have their data analysed for research purposes. Average age of the participants is 46.2 years, with standard deviation of 14.6 years, which means that the majority of the sample is between 30 and 60 years of age. The youngest participant was 15, and the oldest was 74 years of age. It took an average of 4 minutes to complete the Arabic version of the OSS. For the purpose of a standardized score among OSS and DASH, all scores are rescaled to fall within the range between 30 and 150.

For all the items, in all the test periods, floor effect was 5% or less. On the other hand, no ceiling effect was recorded for any of items. Shapiro-Wilk test was used to check if the data in Arabic OSS significantly deviates from the normal distribution, which was not the case (0.801, $p = 0.075$). A p-value greater than 0.05 indicates that the data is normally distributed.

Reliability

Internal consistency was very high with overall Cronbach's alpha value of 0.95. All items seemed to have strong correlations with the total score ($r > 0.80$). For the purpose of the test-retest reliability, the participants completed the OSS twice. The time between the test and re-test was 2 weeks and no significant difference was observed between the first and second assessment ($p = 0.110$). The value of ICC was ranged from 0.8 to 0.93 (Table 1). According to the previously published paper by Koo et al. values less than 0.5, between 0.5 and 0.75, between 0.75 and 0.9, and greater than 0.90 are indicative of poor, moderate, good, and excellent reliability, respectively (Koo et al. 2016). Thus, this indicates an excellent reliability.

Construct Validity

The Arabic OSS proved to be significantly correlated with the DASH Score, as was hypothesized in this study. The value of correlation between the OSS and the DASH Score was $r = 0.92$, which indicates a very high correlation and agreement between the two questionnaires.

Discussion

Dawson et al. presented the OSS as a disease-specific questionnaire designed for the patient for the evaluation of degenerative and inflammatory disorders of the shoulder way back in 1996 [12]. Since then, it has become a tool of choice in clinical assessments involving both operative and conservative treatments. The score has been validated in many cultures and languages, such as German, French, Dutch, Korean, and Italian [30-35]. The major finding of this study was that the Arabic version of OSS proved to be a reliable tool for assessment of patients with shoulder pain.

In this paper, we have outlined the step-by-step process of cross-cultural adaptation of the Oxford Shoulder Score in the Arabic language, and also given proof of its validity and reliability in patients suffering from shoulder disability and pain.

Shoulder pain accounts for 7-25% of the general population [36]. A 2005 study by Al-Awadhi et al. investigating the incidence of

musculoskeletal pain in Kuwaiti adults found out that over 6.6% of the adult population were vulnerable [37]. Therefore, joint replacement, arthroscopic sport medicine shoulder surgery, and modern shoulder surgery has attracted the attention of orthopedic surgeons within the last two decades. Also, the current trend towards international meta-analysis and multicenter studies has resulted in an increased need for more standard clinical measures [38]. In the aspect of shoulder medicine and surgery, clinical instruments have been reported to be very responsive, comprehensive, reliable, and reproducible [39-41].

Reports suggest that various static measurements examine the reliability and agreement of the questionnaires. In our study, we had a Cronbach's alpha coefficient of 0.95, with the Interclass Coefficients (ICC) ranging from 0.8 to 0.93. These values are similar to those of Slovene, German, Persian, Brazilian, and Thai versions (ICC = 0.84-0.95) [41-43]. This indicates an excellent value for the Arabic Oxford shoulder score to show reliability, thus confirming a high internal consistency for the Arabic OSS. As for the construct validity of the English OSS compared with the English DASH score, the Spearman's correlation was 0.79 [16]. However, with the same comparison applied to the same scores in Arabic, a slightly higher correlation result of 0.92 was yielded from the analysis.

Conclusion

In conclusion, the translation of the OSS to Arabic was successful and confirmed to have good validity, reliability, and responsiveness. It can be used for assessment of the functioning/recovery status of Arabic patients with symptomatic shoulder malfunctions in treatments or clinical studies, assisting clinicians, or researchers to collect necessary data.

Acknowledgement

We are grateful to the authors of the original OSS. Their guidance through every stage of this research is deeply appreciated.

Conflict of Interest

None.

References

- Alotaibi NM (2010) Cross-cultural adaptation process and pilot testing of the Arabic version of the Disability of the Arm, Shoulder and Hand (DASH-Arabic). *Hand Therapy* 15: 80-86.
- Chakravarty KK, Webley M (1990) Disorders of the shoulder: An often unrecognised cause of disability in elderly people. *BMJ* 300: 848-849. [[crossref](#)]
- Chard MD, Hazleman R, King RH, Reiss BB (1991) Shoulder disorders in the elderly: a community survey. *Arthritis Rheum* 34: 766-769. [[crossref](#)]
- Badley EM, Tennant A (1992) Changing profile of joint disorders with age: Findings from a postal survey of the population of Calderdale, West Yorkshire, United Kingdom. *Ann Rheum Dis* 51: 366-371. [[crossref](#)]
- Van Schaardenburg D, Van den Brande KJ, Ligthart GJ, Breedveld FC, Hazes JMW (1994) Musculoskeletal disorders and disability in persons aged 85 and over: a community survey. *Ann Rheum Dis* 53: 807-811. [[crossref](#)]
- Dawson J, Fitzpatrick R, Carr A (1996) Questionnaire on the perceptions of patients about shoulder surgery. *J Bone Joint Surg Br* 78: 593-600. [[crossref](#)]
- McCormick A, Fleming D, Charlton J (1995) Morbidity statistics from general practice. 4th National Study 1991-1992. London: HMSO; Office of Population Censuses and Surveys, Series MB5 No 3.

Table 1: Internal consistency of Arabic OSS.

Item of OSS Score	Mean Score	SD	Item-Total Score Correlation*	Cronbach's Alpha
1	2.21	0.91	0.85	0.96
2	2.51	0.84	0.82	0.95
3	3.01	0.76	0.90	0.93
4	3.06	0.77	0.85	0.97
5	2.68	0.90	0.84	0.97
6	2.71	1.12	0.86	0.94
7	2.45	0.65	0.90	0.95
8	2.01	1.20	0.80	0.96
9	2.09	0.87	0.93	0.92
10	2.74	0.88	0.89	0.93
11	2.21	0.84	0.88	0.95
12	2.38	1.12	0.82	0.96

Note: *All ICC values are significant at 0.001 level.

8. Croft P (1998) Measuring up to shoulder pain. *Ann Rheum Dis* 57: 650-66. [[crossref](#)]
9. Bamji AN, Dieppe PA, Haslock DI, Shipley ME (1990) What do rheumatologists do? A pilot audit study. *Br J Rheumatol* 29: 295-298.
10. Croft P, Pope D, Zonca M, O'Neill T, Silman A (1994) Measurement of shoulder related disability: results of a validation study. *Ann Rheum Dis* 53: 525-528. [[crossref](#)]
11. Ekberg K, Bjorkqvist B, Malm P, Bjerre-Kiely B, Axelson O (1994) Controlled two-year follow up of rehabilitation for disorders in the neck and shoulders. *Occup Environ Med* 51: 833-838. [[crossref](#)]
12. Dawson J, Hill G, Fitzpatrick R, Carr A (2001) The benefits of using patient-based methods of assessment. Medium-term results of an observational study of shoulder surgery. *J Bone Joint Surg Br* 83: 877-882. [[crossref](#)]
13. Koo, TK, Li MY (2016) A Guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of Chiropractic Medicine* 15: 155-163. [[crossref](#)]
14. MacDonald DA (1993) The shoulder and elbow. In: Fairbank JC, Carr A, editors. *Outcome Measures in Orthopaedics*. Oxford: Butterworth Heinemann. pp. 144-173.
15. Drake BG, Callahan CM, Dittus RS, Wright JG (1994) Global rating systems used in assessing knee arthroplasty outcomes. *J Arthroplasty* 9: 409-417.
16. Conboy VB, Morris RW, Kiss J, Carr AJ (1996) An evaluation of the Constant-Murley shoulder assessment. *J Bone Joint Surg Br* 78: 229-232. [[crossref](#)]
17. Wright JG, Rudicel S, Feinstein AR (1994) Ask patients what they want: Evaluation of individual complaints before total hip replacement. *J Bone Joint Surg Br* 76: 229-234. [[crossref](#)]
18. Amadio PC (1993) Editorial. Outcomes measurement: More questions; same answers. *J Bone Joint Surg Am* 75: 1583-1584.
19. Fitzpatrick R, Fletcher A, Gore S, Jones D, Spiegelhalter D, Cox D (1992) Quality of life measures in health care. I: Applications and issues in assessment. *BMJ* 305: 1074-1077. [[crossref](#)]
20. Roy JS, MacDermid JC, Woodhouse LJ (2009) Measuring shoulder function: a systematic review of four questionnaires. *Arthritis Rheum* 61: 623-632. [[crossref](#)]
21. Linsell L, Dawson J, Zondervan K, Rose P, Randall T, et al., (2006) Prevalence and incidence of adults consulting for shoulder conditions in UK primary care; patterns of diagnosis and referral. *Rheumatology (Oxford)* 45: 215-221. [[crossref](#)]
22. Masnoon N, Shakib S, Kalisch-Ellett L, Caughey, GE (2018) Tools for Assessment of the Appropriateness of Prescribing and Association with Patient-Related Outcomes: A Systematic Review. *Drugs & Aging* 35: 43-60. [[crossref](#)]
23. Byrne BM (2016) Adaptation of assessment scales in cross-national research: Issues, guidelines, and caveats. *International Perspectives in Psychology: Research, Practice, Consultation* 5: 51-65.
24. Uhtoff HK, Sarkar K (1990) An algorithm for shoulder pain caused by soft tissue disorders. *Clin Orthop* 254: 121-127. [[crossref](#)]
25. Guillemin F, Bombardier C, Beaton D (1993) Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *J Clin Epidemiol* 46: 1417-1432. [[crossref](#)]
26. Acquadro C, Jambon B, Ellis D, Marquis P (1996) Language and translation issues. In: Spilker B, editor. *Quality of Life and Pharmacoeconomics in Clinical Trials*. 575-585.
27. Anderson RT, MacFarlane M, Naughton MJ, Shumaker SA (1996) Conceptual issues and considerations in cross-cultural validation of generic health-related quality of life instruments. 2nd (edn.). Philadelphia: Lippincott.
28. Kennedy CA, Beaton DE, Smith P, VanEerd D, Tang K, et al., (2013) Measurement properties of the Quick DASH (disabilities of the arm, shoulder and hand) outcome measure and cross-cultural adaptations of the Quick DASH: a systematic review. *Qual Life Res* 22: 2509-2547. [[crossref](#)]
29. Fayers PM, Machin D (2013) *Quality of life: the assessment, analysis and interpretation of patient-reported outcomes*. Manhattan: John Wiley & Sons.
30. Huber W, Hofstaetter JG, Hanslik-Schnabel B, Posch M, Wurnig C (2004) The German version of the Oxford Shoulder Score--cross-cultural adaptation and validation. *Arch Orthop Trauma Surg* 124: 531-536. [[crossref](#)]
31. Tuğay U, Tuğay N, Gelecek N, Özkan M (2011) Oxford Shoulder Score:cross-cultural adaptation and validation of the Turkish version. *Arch Orthop Trauma Surg* 131: 687-694. [[crossref](#)]
32. Murena L, Vulcano E, D'Angelo F, Monti M, Cherubino P (2010) Italian cross-cultural adaptation and validation of the Oxford Shoulder Score. *J Shoulder Elbow Surg* 19: 335-341. [[crossref](#)]
33. Frich LH, Noergaard PM, Brorson S (2011) Validation of the Danish version of Oxford Shoulder Score. *Dan Med Bull* 58: 4335. [[crossref](#)]
34. Jamnik H, Spevak MK (2008) Shoulder Pain Disability Index: Validation of Slovene version. *Int J Rehabil Res* 31: 337-341. [[crossref](#)]
35. Ebrahimzadeh MH, Birjandinejad A, Golhasani F, Moradi A, Vahedi E, et al., (2015) Cross-cultural adaptation, validation, and reliability testing of the Shoulder Pain and Disability Index in the Persian population with shoulder problems. *Int J Rehabil Res* 38: 84-87. [[crossref](#)]
36. Bjelle A (1989) Epidemiology of shoulder problems. *Baillieres Clin Rheumatol* 3: 437-451.
37. Al-Awadhi AM, Olusi SO, Al-Saeid K, Moussa M, Shehab D, et al., (2005) Incidence of musculoskeletal pain in adult Kuwaitis using the validated Arabic version of the WHO-ILAR COPCORD Core Questionnaire. *Ann Saudi Med* 25: 459-462. [[crossref](#)]
38. Ekeberg OM, Bautz-Holter E, Tveitå EK, Keller A, Juel NG, Brox JI (2008) Agreement, reliability and validity in 3 shoulder questionnaires in patients with rotator cuff disease. *BMC Musculoskelet Disord* 9: 68. [[crossref](#)]
39. Wilson J, Baker P, Rangan A (2009) Is retrospective application of the Oxford Shoulder Score valid? *J Shoulder Elbow Surg* 18: 577-580. [[crossref](#)]
40. Younis F, Sultan J, Dix S, Hughes PJ (2011) The range of the Oxford Shoulder Score in the asymptomatic population: a marker for post-operative improvement. *Ann R Coll Surg Engl* 93: 629-633. [[crossref](#)]
41. Martins J, Napoles BV, Hoffman CB, Oliveira A (2010) The Brazilian version of Shoulder Pain and Disability Index: translation, cultural adaptation and reliability. *Rev Bras Fisioter* 14: 527-536. [[crossref](#)]
42. Phongamwong C, Choosakde A (2015) Reliability and validity of the Thai version of the Shoulder Pain and Disability Index (Thai SPADI). *Health Qual Life Outcomes* 13: 136. [[crossref](#)]
43. Roach KE, Budiman-Mak E, Songsiridej N (1991) Development of a shoulder pain and disability index. *Arthritis Care Res* 4:143-149. [[crossref](#)]

Citation:

Aliaa Fareed Khaja, Hanna S, Bouhamra A and Maqdes A (2020) A Cross-Cultural Adaptation of the Oxford Shoulder Score: The Arabic Version. *Integr J Orthop Traumatol* Volume 3(2): 1-4.