

Research Article

Validity and reliability of the Turkish version of the Shoulder Rating Questionnaire in patients with shoulder pain

Betül Çiftçi¹ , Ashlhan Uzunkulaoglu² , Deniz Öke Topçu³ ¹Department of Physical Therapy and Rehabilitation, Kırklareli University, School of Health Science, Kırklareli, Turkey²Department of Physical Medicine and Rehabilitation, Ufuk University, School of Medicine, Ankara, Turkey³Department of Physical Medicine and Rehabilitation, Gaziosmanpaşa Training and Research Hospital, İstanbul, Turkey

ARTICLE INFO

Article history:

Submitted February 10, 2019

Received in revised form

March 14, 2021

Accepted April 9, 2021

Keywords:

Outcome shoulder disability

Shoulder pain

Shoulder diseases

Shoulder rating questionnaire

ORCID iDs of the authors:

B.Ç. 0000-0002-7184-0862;

A.Ü. 0000-0003-3575-725X;

D.Ö.T. 0000-0003-3213-0363.

ABSTRACT

Objectives: The aim of this study was to translate the Shoulder Rating Questionnaire (SRQ-T) into Turkish and to determine the validity and reliability of the translated version in patients with shoulder pain.

Methods: The Turkish version of the SRQ-T was applied to patients after translation from English into Turkish. Patients with various shoulder pain complaint were included into the study if they were over 18 years. The patients with mixed-type pain, cancer pain, headache, substance abuse, severe depression, and fibromyalgia syndrome were excluded. The musculoskeletal and neurological examinations of the patients were performed. The Turkish version of the SRQ-T and Disabilities of arm, shoulder, hands-T (DASH-T) were applied to all patients.

Results: 122 patients were included in the study, and then patients are divided into two groups: Group 1, working group (n = 72); Group 2, non- working group (n = 50). The reliability and consistency of SRQ-T for all the samples were acceptable with a Cronbach's coefficient of 0.979. The test-retest method was used to determine reliability of the scale. Cronbach's alpha was measured pre-assessment and post- assessment; the values were 0.815 and 0.770, respectively. The correlation analysis was determined for all the samples and calculated as 0.780. Also, the test-retest method with Wilcoxon Signed Rank Test was used to determine reliability of the SRQ- T and its domains in group 1 and group 2.

Conclusion: The Turkish version of the SRQ-T seems to be a valid and reliable self-administered questionnaire to evaluate the shoulder pain in Turkish patients.

Level of Evidence: Level II, Diagnostic Study

Introduction

Shoulder pain is one of the most common musculoskeletal problems in adult population, and 7% to 26% of adults experience shoulder pain.^{1,2} The rate of shoulder pain in women is higher than in men, and the pain often becomes elevated with age.^{3,4} Activities of Daily Living (ADL), such as dressing, driving, bathing and housekeeping, can be affected by shoulder pain and the decreased mobility of the shoulder.⁵ The most common disorder in patients with shoulder pain complaints is subacromial pain syndrome.^{6,7} This common condition includes rotator cuff tears, tendinitis and bursitis.⁸ Other disorders of the shoulder include acromioclavicular pathologies, labral tears, adhesive capsulitis, long head of bicep brachii pathologies, scapular dyskinesis and fractures.⁹ Evaluation of shoulder pain aetiology depends on the symptoms of the patient, and physical examinations are typically used to diagnose shoulder pain aetiology and functional abilities. However, imaging tools, such as directed graph, computerized tomography, magnetic resonance imaginary and ultrasonography, are useful for diagnosis.⁵

The American Shoulder and Elbow Surgeons Evaluation Assessment Form (ASES); the Constant, Murley Score; the Western Ontario shoulder tools (ie, the Western Ontario Shoulder Instability Index, the Western Ontario Osteoarthritis of the Shoulder Index, the Western Ontario Rotator Cuff Index); the Disabilities of the Arm, Shoulder and Hand (DASH) Questionnaire; the Shoulder Pain Disability Index (SPADI); the Simple Shoulder Test; and the Oxford Shoulder Score are used to assess pain, restriction and function in shoulder disabilities.¹⁰⁻¹⁸ Some of these tests are "objective" assessments, such as the Constant–Murley Score, whereas some of these tests are "subjective" assessments, such as the SPADI.^{12,13} Most of the tests are patient-based measures to assess pain, range of motion and ADL.¹⁹ The ASES and the Constant–Murley Score have domains that are completed by both the patient and the clinician, but neither test is self-reported.^{20,21} The DASH is another preferred questionnaire; although it is not specific to shoulder disabilities, it can be used for other upper extremity disabilities.^{11,22} The Oxford Shoulder Score informs about patients' quality of life.²³ The Simple Shoulder Test is a short assessment for pain and shoulder func-

Corresponding Author:

Betül Çiftçi
btcfct@hotmail.com

Content of this journal is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

Cite this article as: Çiftçi B, Uzunkulaoglu A, Topçu DÖ. Validity and reliability of the Turkish version of the Shoulder Rating Questionnaire in patients with shoulder pain. *Acta Orthop Traumatol Turc* 2021; 55(3):208-12.

tion, but it does not inform about the quality in which patients can perform ADL.²⁴ Unlike many questionnaires, the Shoulder Rating Questionnaire (SRQ) is a patient-based questionnaire and contains a global assessment of pain; ADL, work, recreational and athletic activities; areas of improvement and satisfaction. Also, the SRQ is a useful tool, since it is a self-administered questionnaire.²⁵ The SRQ was created by L'Insalata et al. to assess the function of patients with shoulder problems.²⁶ The SRQ has also been translated into several languages and has been found to be valuable and reliable for different populations.^{19,27,28} Based on these values of the SRQ, in this study, we aimed to translate the original English SRQ into a Turkish-language version (SRQ-T), to adapt the questionnaire for Turkish patients and assess the reliability, validity and internal consistency of the SRQ-T in terms of various shoulder disorders.

Materials and Methods

This validation study was approved by the university ethics committee, and written consent was obtained from all participants. Before adapting the original SRQ to Turkish, written permission was acquired by email from the authors of the original study. Translation and adaptation of the SRQ were done by considering the suggested guidelines of cross-cultural adaptation.²⁹ At first, the English SRQ was translated into Turkish by four native Turkish-speaking physicians, a mechanical engineer and a teacher. Following this, a native English speaker who was not familiar with the initial questionnaire and was fluent in Turkish retranslated the Turkish questionnaire into English. The authors evaluated all the translations and chose the most accurate Turkish translation. Some of the activities mentioned in some of the questions, such as golf and baseball, are not common sportive activities for the Turkish population. Thus, these activities were changed to reflect more commonly known activities with similar physical properties, such as throwing a ball, throwing a ball away with a two-handed stick or hitting it on a stone with a two-handed stick.

The chosen form of the questionnaire was applied to a pilot group consisting of 30 patients who experience shoulder pain. Also, the group was asked whether there were any incomprehensible questions in the SRQ-T. The final revision was assessed for the suitability of the translated questionnaire. After the pilot study, all patients with shoulder pain complaints were evaluated. The patients with shoulder pain related to shoulder disorders, such as shoulder impingement syndrome, bicep tendinitis, adhesive capsulitis or glenohumeral pathologies, were included in the study if they were over 18 years of age and had not taken part in another pain study within the last 30 days. The patients who had mixed-type pain or cancer pain, headaches, a history of substance abuse, heavy depression or fibromyalgia were excluded from the study. All patients underwent musculoskeletal and neurological examinations.

The Turkish version of the DASH questionnaire and the SRQ-T were administered to all patients. The DASH-T is designed to assess the health status of the upper extremities. Preliminary publication of DASH was in 1996, and the latest edition was published in 2011.^{11,30} The reliability and validity study of the DASH-T was performed by Dürger et al.³¹ The scale contains 30 items to assess shoulder symptoms and function. The DASH-T includes 6 items to assess symptoms, such as pain, tingling/numbness, weakness and stiffness, and 24 items to assess function, such as physical function or social/role function. Also, there are additional domains to evaluate 4 items about work and 4 items about sports/performing arts. All items are calculated with a 5-point Likert-type scale of difficulty: 1 = no difficulty, 2 = mild difficulty, 3 = moderate difficulty, 4 = severe difficulty and 5 = extreme difficulty.³²

The SRQ is a self-report questionnaire with subscales that include pain, global assessment and improvement, ADL, work and recreational activities.²⁶ The SRQ includes seven subscales comprising 21 items. The work subscale has a non-graded question that classifies work (Question 15). The summarized score does not contain satisfaction subscale (Question 20) or importance subscale (Question 21). Global subscale is assessed with a visual analogue scale on a 10-cm-long line; the lower the score, the more severe the pain. Other subscales contain five-choice questions and are scored from 1 (poorest) to 5 (best). Each subscale is calculated individually by multiplying the averages of the total score by 2. Hence, the possible score for each subscale is between 2 (poorest) and 10 (best). The maximum possible score is 15 for global assessment (subscale score multiplied by 1.5), 40 for pain (subscale score multiplied by 4), 20 for ADL (subscale score multiplied by 2), 15 for recreational and athletic activities (subscale score multiplied by 1.5) and 10 for work (subscale score multiplied by 1). Thereby, the total possible score is between 17 and 100.²⁶

Statistical analysis

The study group consists of both working and non-working patients, and the work domain of the DASH-T questionnaire is optional to include, so some patients did not fill out this work domain. Thus, all the patients were grouped into either Group 1 (working group) or Group 2 (non-working group).

The patients' demographic and clinical characteristics were expressed as categorical variables, and mean (standard deviation) frequencies (%) were used to express continuous variables. All data for normality were analysed with the Kolmogorov-Smirnov test. The groups' demographic characteristics were compared with the Mann-Whitney *U*-test. Data were analysed with SPSS for Windows (version 18.0; Chicago, IL, US).

The SRQ-T and DASH-T questionnaire answers were obtained in two sessions (before and after evaluation) with at least three-day intervals between the sessions. The reliability of the SRQ-T was analysed using internal consistency and test-retest reliability. Internal consistency was detected by assigning an intraclass correlation coefficient (ICC) with a 95% confidence interval that ranged from 0 and 1.

Cronbach's alpha coefficient was calculated before and after the evaluation of the questionnaire to detect the internal consistency of the SRQ-T subscales. The test-retest method with the Wilcoxon signed-rank test was used to determine the reliability of the SRQ-T and its domains. Then, the evaluation of the discriminant validity of the SRQ-T for the assessment of shoulder pain was determined using Spearman correlation coefficients. A Spearman correlation coefficient score more than 0.70 was accepted for reliability.^{33,34}

HIGHLIGHTS

- 122 patients with various shoulder pain complaint were included in the study.
- The Turkish version of the Shoulder Rating Questionnaire (SRQ-T) and Disabilities of arm, shoulder, hands-T (DASH-T) were applied to the patients.
- The Turkish version of the SRQ-T is a valid and reliable self-administered questionnaire to evaluate the shoulder pain in Turkish patients

Table 1. Demographic Data and Clinical Properties of Working (Group 1) and Non-Working Patients (Group 2)

	Group 1 Working Group (n = 72)	Group 2 Non-Working Group (n = 50)	P*
Age (mean ± SD)	55.36 ± 142.20	54.80 ± 10.07	0.662
Gender (female/male)	47/25	29/21	0.417
Painful shoulder side			
Right	41 (56.9%)	35 (70.0%)	0.145
Left	31 (43.1%)	15 (30.0%)	
Dominant hand			
Right	65 (90.3%)	43 (86.0%)	0.468
Left	7 (9.7%)	7 (14.0%)	
DASH-T	42.85 ± 14.37	36.33 ± 9.76	0.012**

*Mann-Whitney U-Test.
**P < 0.05.
SD, Standard Deviation; DASH-T, Turkish Version of the Disabilities of the Arm, Shoulder and Hand Scale.

Table 2. Aetiology of Pain in the Study Population

	N (%)
Working patients group (n = 72)	
Rotator cuff injury	27 (37.5%)
Adhesive capsulitis	12 (16.7%)
Shoulder impingement syndrome	22 (30.6%)
Bicipital tendinitis	6 (8.3%)
Subacromial bursitis	3 (4.2%)
Glenohumeral arthritis	2 (2.8%)
Non-working patients group (n = 50)	
Rotator cuff injury	13 (26%)
Adhesive capsulitis	10 (20%)
Shoulder impingement syndrome	23 (46%)
Bicipital Tendinitis	1 (2.0%)
Subacromial bursitis	2 (4%)
Glenohumeral arthritis	1 (2.0%)

Results

Patient Population

This study included 122 patients with shoulder pain. All patients filled out the questionnaires, and there were no missing data. The patients were grouped into Group 1 (working group, n = 72) and Group 2 (non-working group, n = 50). A comparison of the demographic properties of the groups was done using the Mann-Whitney U-test. Demographic and clinical properties of the patients are shown in Table 1. There was a statistically significant difference in the DASH-T score (P = 0.001), but there were no other significant differences in terms of other demographic or clinical characteristics between the two groups (P > 0.05).

The aetiologies of shoulder pain in all patients are summarised in Table 2. The majority of patients had shoulder rotator cuff injuries (n = 27, 37.5%) or shoulder impingement syndrome (n = 23, 46%) in Group 1 and Group 2, respectively (Table 2).

Validity and Reliability

The test-retest method was used to determine the reliability of the SRQ-T. The ICC was used for the internal consistency analysis of the SRQ-T and was determined to be 0.979 (0.970-0.985) for the overall sample, whereas for Group 1 and Group 2, the ICCs were 0.971 (0.954-0.982) and 0.988 (0.979-0.993), respectively (Table 3).

Table 3. Test-Retest Scores of the Turkish-Language Shoulder Rating Questionnaire (SRQ-T) to Detect Reliability and Internal Consistency in Patients with Shoulder Pain

	Overall Sample (n = 122)	Group 1 (n = 72)	Group 2 (n = 50)
	ICC (95% CI)	ICC (95% CI)	ICC (95% CI)
Total Scale Score: test-retest reliability	0.979 (0.970-0.985)	0.971 (0.954-0.982)	0.988 (0.979-0.993)
	Cronbach's α	Cronbach's α	Cronbach's α
Pre-assessment	0.815	0.701	0.829
Post-assessment	0.770	0.688	0.875

ICC (95% CI), intraclass Correlation Coefficient (95% Confidence Interval).

Table 4. Comparison of Test and Retest Shoulder Rating Questionnaire (SRQ) Domain Scores of Working Patients (Group 1) to Detect Reliability

	Test (Mean ± SD)	Retest (Mean ± SD)	P*	ICC (95% CI)
SRQ-T summary score	92.50 ± 48.56	93.50 ± 49.92	0.027**	0.971 (0.954-0.982)
Domains of SRQ-T				
Global assessment	7.33 ± 3.83	7.61 ± 3.77	0.210	0.959 (0.935-0.975)
Pain	17.02 ± 6.38	17.41 ± 6.55	0.205	0.964 (0.942-0.977)
ADL	10.56 ± 3.62	10.86 ± 3.32	0.183	0.852 (0.763-0.907)
Sports/recreational activities	8.45 ± 2.75	8.36 ± 2.86	0.562	0.878 (0.805-0.924)
Work	5.18 ± 2.49	5.66 ± 2.59	0.074	0.871 (0.795-0.920)

**Wilcoxon Signed Rank Test.
*P < 0.05.
SRQ-T, Turkish Version of the Shoulder Rating Questionnaire; ADL, Activities of Daily Living; ICC (95% CI), Intraclass Correlation Coefficient (95% Confidence Interval).

Table 5. Comparison of Test and Retest Shoulder Rating Questionnaire (SRQ) Domain Scores of Non-Working Patients (Group 2) to Detect Reliability

	Test (Mean ± SD)	Retest (Mean ± SD)	P*	ICC (95% CI)
SRQ-T summary score	39.85 ± 12.38	40.47 ± 13.52	0.140	0.988 (0.979-0.993)
Domains of SRQ-T				
Global assessment	6.72 ± 3.21	6.75 ± 3.06	0.782	0.985 (0.973-0.991)
Pain	13.72 ± 5.51	13.84 ± 5.61	0.651	0.981 (0.966-0.989)
ADL	11.65 ± 2.75	12.14 ± 3.79	0.440	0.850 (0.735-0.915)
Sports/recreational activities	7.76 ± 3.12	7.74 ± 2.75	0.939	0.964 (0.937-0.980)

*Wilcoxon Signed Rank Test.
*P < 0.05.
SRQ-T, Turkish Version of the Shoulder Rating Questionnaire; ADL, Activities of Daily Living; ICC (95% CI), Intraclass Correlation Coefficient (95% Confidence Interval).

Table 6. Spearman Correlation Coefficients Between the Summary Score of the Turkish-Language Shoulder Rating Questionnaire (SRQ-T)

	Overall Patients (N = 122)		Group 1 (N = 72)		Group 2 (N = 50)	
	SRQ-T	P*	SRQ-T	P*	SRQ-T	P*
DASH-T	0.780	<0.001	0.720	<0.001	0.765	<0.001

*P < 0.001 (derived from correlation analysis).
SRQ-T, Turkish Version of the Shoulder Rating Questionnaire; DASH-T, Turkish Version of the Disabilities of the Arm, Shoulder and Hand.

Cronbach's alpha for the overall sample at pre- and post-assessment were 0.815 and 0.770, respectively (Table 3). Cronbach's alpha for the pre-assessment was 0.701 and 0.829, respectively, for Group 1 and Group 2. And, Cronbach's alpha for the post-assessment was 0.688 and 0.875, respectively, for Group 1 and Group 2 (Table 3). These results mean that the scale has a high level of internal consistency.

The test-retest method with the Wilcoxon signed-rank test was used to determine the reliability of the SRQ-T and its domains in Group 1 and Group 2 (Tables 4 and Table 5, respectively). The SRQ-T summary score of Group 1 was significantly better at the baseline assessment ($P = 0.027$), and the ICC for the summary score was 0.971. The ICC for the summary score of Group 2 was 0.988, but the result was not statistically significant ($P = 0.140$). In both groups, the ICCs of the domains of global assessment, pain, ADL and sports/recreational activities were good (all 0.85 or higher). In Group 1, the ICCs of the domains of global assessment, pain, ADL, sports/recreational activities and work were 0.959, 0.964, 0.852, 0.878 and 0.871, respectively. In Group 2, the ICCs of the domains of global assessment, pain, ADL and sports/recreational activities were 0.985, 0.981, 0.850 and 0.964, respectively. Also, all the domains of Group 2 were not significantly better than the baseline assessment ($P > 0.05$).

The Spearman correlation coefficients between the summary score of the SRQ-T and DASH-T questionnaire are presented in Table 6. The correlation analysis was determined for all samples, Group 1 and Group 2, and the results were 0.780, 0.720 and 0.765. All the results were statistically significant ($P < 0.001$).

Discussion

In the current study, we assessed the reliability and validity of the SRQ-T in the evaluation of patients with shoulder pain, and the reliability and internal consistency of the SRQ-T for all samples were acceptable, with Cronbach's alpha coefficient of 0.979. The original English SRQ was adapted into Turkish and validated. This test is beneficial when assessing the effect of shoulder problems, such as shoulder function, events including the upper extremities and social involvement (work, sports and recreational activities). In particular, the last three properties are not prevalent in the other questionnaires that evaluate shoulder problems. The domains of work, sports and recreational activities of the SRQ are important for patients' ADL.

There are many scales used in the evaluation of shoulder pain and function, but most of them are not appropriate for all symptoms of shoulder pain. The DASH, SPADI, Constant-Murley Score, ASES and Oxford Shoulder Score are used for the evaluation of alterations after treatment, functional status and the quality of life of patients with shoulder problems. The SPADI and ASES are measures that include a wide variety of items for the patient and the examiner to answer. The Constant-Murley Score is a short self- and examiner-based protocol with low reliability and validity. The Oxford Shoulder Score is typically used for surgical-related problems.³¹

The SRQ has been translated into several languages and has been found to be valuable and reliable for different populations.^{19,27,28} A validation study of the Korean version of the SRQ (SRQ-K) involved 52 participants and demonstrated Cronbach's alpha for an internal consistency of 0.75. The test-retest reliability of the SRQ-K and the domains of the SRQ-K ranged from 0.84 to 0.95.²⁸ Another study of the Dutch version of the SRQ (SRQ-DLV) involved 107 participants with the following conditions: adhesive capsulitis ($n = 68$), calcifying tendinitis ($n = 22$) and impingement syndrome or rotator cuff tears ($n = 17$). Cronbach's alpha for internal consistency was 0.89 for the total questionnaire. Also, Cronbach's alpha for internal consistency was detected for the domains of pain, ADL, sports/recreational activities and work (0.81, 0.80, 0.72 and 0.84, respectively). The test-retest reliability of the SRQ-DLV and the ICC score of the SRQ-DLV's subscales ranged from 0.63 to 0.86. The summary score of the SRQ-DLV

indicated the quality of shoulder function, ADL and life. The summary and the subscale scores (except the work subscale) had large effect sizes. Therefore, the SRQ-DLV demonstrated the response capacity to post-treatment clinical changes.¹⁹ The Brazilian version of the SRQ has also demonstrated good levels of reliability, with Cronbach's alpha of 0.89 and an ICC of 0.83, with the validity of the items ranging from 0.54 to 0.99. Cohen's d and T-test for repeated measures indicated that the questionnaire is able to follow up shoulder function.²⁷

The results of the current study indicated that the SRQ-T is reliable and valuable in the evaluation of shoulder pain and is similar in terms of validity and reliability to other studies of SRQs for different populations.^{19,27,28} Cronbach's alpha coefficient score was above 0.70 for all questionnaires and domains. Also, the ICC values of the SRQ-T total scores were interpreted as having high reliability.

This study, however, has some limitations. First, in both groups, the ICCs of the domains of global assessment, pain, ADL and sports/recreational activities were good (all 0.85 or higher); however, the ICC values of the domains were not statistically significant. Second, athletic and recreational activities are mostly enjoyed by young people, and in our study, the median age of participants was 55.36; therefore, the majority of the participants were middle aged or elderly, and this may have influenced the results.

In conclusion, the original English SRQ was adapted into Turkish. The SRQ-T was determined to be an acceptable, valid and reliable assessment to evaluate shoulder pain in the Turkish population. Therefore, the SRQ-T can be used for the screening and diagnosis of various shoulder disorders and can also be useful in clinical trials.

Ethics Committee Approval: Ethics committee approval was received for this study from the Ethics Committee of Ufuk University, School of Medicine (20181106/04).

Informed Consent: Written informed consent was obtained from all participants.

Author Contributions: Concept - B.Ç., A.U.; Design - B.Ç.; A.U.; Supervision - A.U.; Resources - B.O.; D.Ö.T.; Materials - B.Ç., D.Ö.T.; Data Collection and/or Processing - B.Ç., D.Ö.T.; Analysis and/or Interpretation - B.Ç., A.U.; Literature Review - B.Ç., A.U.; Writing - B.Ç., A.U., D.Ö.T.; Critical Review - B.Ç., A.U., D.Ö.T.

Conflict of Interest: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

References

1. Urwin M, Symmons D, Allison T, et al. Estimating the burden of musculoskeletal disorders in the community: The comparative prevalence of symptoms at different anatomical sites, and the relation to social deprivation. *Ann Rheum Dis.* 1998;57(11):649-655. 10.1136/ard.57.11.649
2. Luime JJ, Koes BW, Hendriksen IJ, et al. Prevalence and incidence of shoulder pain in the general population: a systematic review. *Scand J Rheumatol.* 2004;33(2):73-81. 10.1080/03009740310004667
3. Linsell L, Dawson J, Zondervan K, et al. Prevalence and incidence of adults consulting for shoulder conditions in UK primary care; patterns of diagnosis and referral. *Rheumatology (Oxford).* 2006;45(2):215-221. 10.1093/rheumatology/kei139
4. Bergman S, Herrström P, Högström K, Petersson IF, Svensson B, Jacobsson LT. Chronic musculoskeletal pain, prevalence rates, and sociodemographic associations in a Swedish population study. *J Rheumatol.* 2001;28(6):1369-1377.
5. Greenberg DL. Evaluation and treatment of shoulder pain. *Med Clin North Am.* 2014;98(3):487-504. 10.1016/j.mcna.2014.01.016
6. Michener LA, Walsworth MK, Burnet EN. Effectiveness of rehabilitation for patients with subacromial impingement syndrome: A systematic review. *J Hand Ther.* 2004;17(2):152-164. 10.1197/j.jht.2004.02.004
7. van der Windt DA, Koes BW, de Jong BA, Bouter LM. Shoulder disorders in general practice: Incidence, patient characteristics, and management. *Ann Rheum Dis.* 1995;54(12):959-964. 10.1136/ard.54.12.959

8. Gebremariam L, Hay EM, van der Sande R, Rinkel WD, Koes BW, Huisstede BM. Subacromial impingement syndrome—effectiveness of physiotherapy and manual therapy. *Br J Sports Med.* 2014;48(16):1202-1208. 10.1136/bjsports-2012-091802
9. Holmes RE, Barfield WR, Woolf SK. Clinical evaluation of nonarthritic shoulder pain: Diagnosis and treatment. *Phys Sportsmed.* 2015;43(3):262-268. 10.1080/00913847.2015.1005542
10. Richards RR, An KN, Bigliani LU, et al. A standardized method for the assessment of shoulder function. *J Shoulder Elbow Surg.* 1994;3(6):347-352. 10.1016/S1058-2746(09)80019-0.
11. Hudak PL, Amadio PC, Bombardier C. Development of an upper extremity outcome measure: The DASH (disabilities of the arm, shoulder and hand) [corrected]. The Upper Extremity Collaborative Group (UECG) [published correction appears in *Am J Ind Med* 1996 Sep;30(3):372]. *Am J Ind Med.* 1996;29(6):602-608. 10.1002/(SICI)1097-0274(199606)29:6%3C602::AID-AJIM4%3E;3.0.CO;2-L
12. Constant CR, Murley AH. A clinical method of functional assessment of the shoulder. *Clin Orthop Relat Res.* 1987;(214):160-164. Jan. PMID: 3791738.
13. Roach KE, Budiman-Mak E, Songsrirdej N, Lertratanakul Y. Development of a shoulder pain and disability index. *Arthritis Care Res.* 1991;4(4):143-149. 10.1002/art.1790040403
14. Lippitt SB, Harryman DT, Matsen FA. A practical tool for evaluation of function: the Simple Shoulder Test. In: Matsen FA, Fu FH, Hawkins RJ, editors. *The shoulder: A balance of mobility and stability.* Rosemont, IL: American Academy of Orthopedic Surgeons; 1993. 545-559.
15. Dawson J, Rogers K, Fitzpatrick R, Carr A. The Oxford Shoulder Score revisited. *Arch Orthop Trauma Surg* 2009;129(1):119-123. 10.1007/s00402-007-0549-7
16. Kirkley A, Griffin S, McLintock H, Ng L. The development and evaluation of a disease-specific quality of life measurement tool for shoulder instability. The Western Ontario Shoulder Instability Index (WOSI). *Am J Sports Med.* 1998;26(6):764-772. 10.1177/03635465980260060501
17. Lo IK, Griffin S, Kirkley A. The development of a disease-specific quality of life measurement tool for osteoarthritis of the shoulder: The Western Ontario Osteoarthritis of the Shoulder (WOOS) index. *Osteoarthritis Cartilage.* 2001;9(8):771-778. 10.1053/joca.2001.0474
18. Kirkley A, Alvarez C, Griffin S. The development and evaluation of a disease-specific quality-of-life questionnaire for disorders of the rotator cuff: The Western Ontario Rotator Cuff Index. *Clin J Sport Med.* 2003;13(2):84-92. 10.1097/00042752-200303000-00004
19. Vermeulen HM, Boonman DC, Schüller HM, et al. Translation, adaptation and validation of the Shoulder Rating Questionnaire (SRQ) into the Dutch language. *Clin Rehabil.* 2005;19(3):300-311. 10.1191/0269215505cr8110a.
20. Celik D, Atalar AC, Demirhan M, Dirican A. Translation, cultural adaptation, validity and reliability of the Turkish ASES questionnaire. *Knee Surg Sports Traumatol Arthrosc.* 2013;21(9):2184-2189. 10.1007/s00167-012-2183-3
21. Hazar Kanik Z, Gunaydin G, Pala OO, et al. Translation, cultural adaptation, reliability, and validity of the Turkish version of the Penn Shoulder Score. *Disabil Rehabil.* 2018;40(10):1214-1219. 10.1080/09638288.2017.1284905.
22. Beaton DE, Schemitsch E. Measures of health-related quality of life and physical function. *Clin Orthop Relat Res.* 2003(413):90-105. 10.1097/01.blo.0000079772.06654.c8.
23. Dawson J, Fitzpatrick R, Carr A. Questionnaire on the perceptions of patients about shoulder surgery. *J Bone Joint Surg Br.* 1996;78-B(4):593-600. 10.1302/0301-620X.78B4.0780593
24. Hsu JE, Russ SM, Somerson JS, Tang A, Warme WJ, Matsen FA3rd. Is the Simple Shoulder Test a valid outcome instrument for shoulder arthroplasty? *J Shoulder Elbow Surg.* 2017;26(10):1693-1700. 10.1016/j.jse.2017.03.029
25. Paul A, Lewis M, Shadforth MF, Croft PR, Van Der Windt DA, Hay EM. A comparison of four shoulder-specific questionnaires in primary care. *Ann Rheum Dis.* 2004;63(10):1293-1299. 10.1136/ard.2003.012088
26. L'Insalata JC, Warren RF, Cohen SB, Altchek DW, Peterson MG. A self-administered questionnaire for assessment of symptoms and function of the shoulder. *J Bone Joint Surg Am.* 1997;79(5):738-748. 10.2106/00004623-199705000-00014
27. de Siqueira DC, Baptista AF, Souza I, Sá KN. Tradução, adaptação cultural, validade e confiabilidade do questionário de classificação do ombro para uso no Brasil [Translation, cultural adaptation, validity and reliability of the shoulder rating questionnaire for use in Brazil]. *Rev Bras Reumatol.* 2014;54(6):415-423. 10.1016/j.rbr.2014.04.006
28. Choi Y, Park JW, Noh S, Kim MS, Park YH, Sung DH. Reliability, validity, and responsiveness of the Korean version of the Shoulder Disability Questionnaire and Shoulder Rating Questionnaire. *Ann Rehabil Med.* 2015;39(5):705-717. 10.5535/arm.2015.39.5.705
29. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine (Phila Pa 1976).* 2000;25(24):3186-3191. 10.1097/00007632-200012150-00014
30. Kennedy CA, Beaton DE, Solway S, McConell S, Bombardier C. *The DASH and QuickDASH outcome measure user's manual.* 3rd edn Toronto, Institute for Work & Health; 2011.
31. Düger T, Yakut E, Ç Ö, et al. Kol omuz ve el sorunları (disabilities of arm, shoulder and hand) anketi Türkçe uyarlamasının güvenilirliği ve geçerliliği. *Türk Fizyoterapi ve Rehabilitasyon Dergisi.* 2006;17:99-107. [https://scholar.google.com/scholar_lookup?journal=Fizyoterapi+Rehabilitasyon&title=Reliability+and+validity+of+the+Turkish+version+of+the+Disabilities+of+the+Arm,+Shoulder+and+Hand+\(DASH\)+Questionnaire&volume=17&publication_year=2006&pages=99](https://scholar.google.com/scholar_lookup?journal=Fizyoterapi+Rehabilitasyon&title=Reliability+and+validity+of+the+Turkish+version+of+the+Disabilities+of+the+Arm,+Shoulder+and+Hand+(DASH)+Questionnaire&volume=17&publication_year=2006&pages=99)
32. Angst F, Schwyzer HK, Aeschlimann A, Simmen BR, Goldhahn J. Measures of adult shoulder function: Disabilities of the Arm, Shoulder, and Hand Questionnaire (DASH) and its short version (QuickDASH), Shoulder Pain and Disability Index (SPADI), American Shoulder and Elbow Surgeons (ASES) Society standardized shoulder assessment form, Constant (Murley) Score (CS), Simple Shoulder Test (SST), Oxford Shoulder Score (OSS), Shoulder Disability Questionnaire (SDQ), and Western Ontario Shoulder Instability Index (WOSI). *Arthritis Care Res (Hoboken).* 2011;63(Suppl 11):S174-88. 10.1002/acr.20630
33. Eechaute C, Vaes P, Van Aerschot L, Asman S, Duquet W. The clinimetric qualities of patient-assessed instruments for measuring chronic ankle instability: A systematic review. *BMC Musculoskelet Disord.* 2007;8:6. 10.1186/1471-2474-8-6
34. Nørholm V, Bech P The WHO Quality of Life (WHOQOL) Questionnaire: Danish validation study. *Nord J Psychiatry.* 2001;55(4):229-235. 10.1080/080394801681019075