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TURKISH VERSION OF THE SOUTHAMPTON DUPUYTREN'S SCORING SCHEME: VALIDITY AND RELIABILITY STUDY

SOUTHAMPTON DUPUYTREN SKORLAMA ŞEMASI ANKETİNİN TÜRKÇE UYARLAMASI: GEÇERLİK VE GÜVENİRLİK ÇALIŞMASI

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ABSTRACT

Objective: The aim of this study was to evaluate the reliability and validity of the Turkish version of SDSS in patients with Dupuytren's disease (DD).

Materials and Method: SDSS was translated and culturally adapted from English into Turkish. Cross-cultural adaptation was accomplished in a few stages with the inclusion of translation, back-translation, professional criticism, and pre-testing. The final version was evaluated for reliability and validity study of 50 patients with DD. Patients completed sociodemographic questionnaire form, the Southampton Dupuytren's Scoring Scheme (SDSS), and Turkish version of the Disabilities of the Arm, Shoulder and Hand Score (Quick DASH). Test-retest and internal consistency analyses were used to determine the reliability, construct validity and criterion validity analyses were performed to determine the validity.

Results: A total of 50 patients with DD (14 women and 36 men) were included in the study. The mean age of the participating patients was 61.52±8.51 years (min 37, max 70 years). The test-retest correlation coefficient was 0.769 (p<0.05) and the Cronbach alpha value for internal consistency analysis was 0.783. The ICC for the mean of all 5 items was 0.82. There was a positive good correlation (r=0.573; p>0.05) between the SDSS-T and the Quick DASH.

Conclusion: The Turkish version of the SDSS is a valid and reliable self-administered scheme for measuring the disability caused by the DD which is sensitive to change. Therefore, the SDSS-T is suggested as an outcome measure for assessing to patients with DD in routine clinically.

Keywords: Dupuytren's contracture, Dupuytren's disease, Patient-reported outcome measures

ÖZ

Amaç: Bu çalışmanın amacı Dupuytren hastalığı (DH) olan bireylerde Southampton Dupuytren Skorlama Şeması (SDSŞ) anketinin Türkçe geçerlik ve güvenirliğini değerlendirmekti.

Gereç ve Yöntem: SDSŞ anketi İngilizce'den Türkçe'ye çevrildi ve kültürel adaptasyonu yapıldı. Kültürler arası adaptasyonu çeviri, geri çeviri, uzman görüşü ve ön test olmak üzere birkaç adımda gerçekleştirildi. Anketin son halinin geçerlik ve güvenirliği DH tanısı almış 50 hasta ile değerlendirildi. Hastalar sosyodemografik soru formunu, SDSŞ anketini ve Kol, Omuz, El Sorunları Hızlı Anketini (Quick DASH) tamamladı. Anketin güvenirliğinin belirlenmesinde test-tekrar test ve iç tutarlılık analizleri; geçerliğin belirlenmesinde ise yapı ve ölçüt geçerliği analizleri kullanıldı.

Bulgular: Çalışmaya 50 (14 kadın, 36 erkek) DH'li hasta dahil edildi. Çalışmaya katılan hastaların yaş ortalaması 61.52±8.51 (min 37, maks 70) yıldı. Test-tekrar test korelasyon katsayısı 0.769 (p<0.05) ve iç tutarlılık analizi için Cronbach alfa değeri 0.783 idi. Sınıf içi korelasyon katsayısı (ICC) 5 madde için ortalama 0,82 idi. SDSŞ ve Quick DASH arasında pozitif korelasyon vardı (r=0.573; p>0.05).

Sonuç: SDSŞ'nin Türkçe versiyonu, DH'nin neden olduğu engeli ölçmek için kullanılan değişime duyarlı geçerli ve güvenilir hasta tabanlı bir ankettir. Bu nedenle, klinikte DH'li hastaların rutin değerlendirmelerinde kullanılacak bir sonuç ölçüm aracı olarak önerilmektedir.

Anahtar Kelimeler: Dupuytren kontraktürü, Dupuytren hastalığı, Hasta tarafından bildirilen sonuç ölçütleri

INTRODUCTION

Dupuytren's disease (DD) is a benign connective tissue deformity with unclear underlying etiology. DD has an influence on the palmar fascia of the hand [1]. The incidence amount of DD based on 2007 data in US population calculated that the annual number of new cases of physician-diagnosed disease was roughly 3 cases per 10,000 adults [2]. This situation has been affected by many factors such as age, gender, heredity, diabetes mellitus, epilepsy, carpal tunnel syndrome, frozen shoulder, history of smoking, alcohol consumption, heavy manual work, history of manual labor and hand injury [3]. DD is a pathology which characterized by the creating thickening and bending of the palmar fascia causing permanent flexion contractures of joints and progressive flexion of one or more fingers [4]. Hence, DD usually

restricts a patient's ability of daily living activities such as washing, dressing, putting gloves, holding a cup, shaking hands, etc. [5]. It was seen clearly in patients with DD, hand activity limitations and functional impairment are different.

Assessment of physical condition is of great importance in DD. This assessment consists of objective (such as X-Ray) and subjective (for ex. patient reported outcomes, limitation, aesthetic view etc.) measurements. Physical examination (range of motion, grip and pinch strength, sensibility etc.) could be helpful for diagnosis and treatment of DD. Patient-reported outcome measures (PROMs) are very important as the effectiveness of the treatment is evaluated with the perception of the patient. By a search for methods used before, PROMs which has used for evaluation upper extremity, we found some scoring systems: DASH (Disability of the arm, shoulder and hand), Quick DASH, Michigan Hand Score, Patient Evaluation Measure, the Boston Carpal Tunnel Questionnaire, and the Mayo Wrist Scores [6-11]. These are related to individual's physical symptom and condition. But none of them is specific for patients with DD. And when we investigated we have seen that functional outcome measures of patients with DD consist of some assessments. One of them is the Unite´ Rhumatologique des Affections de la Main (URAM) which was developed for hand function by Beaudreuil et al. in 2011 [5]. The other one is the Southampton Dupuytren's Scoring System (SDSS) which was constructed by Mohan et al. in 2014 [12]. SDSS that could be easily used in clinical practice to measure pain, disability and troublesome patients with DD. It is also important that SDSS is both shorter and more comprehensive than URAM.

There is no questionnaire for the assessment of the discomfort and physical function according to the self-reported of DD sufferers in the Turkish population. To date, a Turkish version of the SDSS has not been validated. The purpose of this study was to translate and culturally adapt the Turkish version of the SDSS and to validate its use for assessing the outcome of patients with DD.

MATERIALS AND METHODS

Before the study, permission for translation and validation of the SDSS into Turkish language was obtained from Dr. Warwick, who developed the SDSS. Ethics committee approval was obtained for the research from Muğla Sıtkı Koçman University Ethics Committee (Decision number: 170039-22). This study was performed with volunteers who were followed up by the Department of Orthopedics and Traumatology - Muğla Sıtkı Koçman University Faculty of Medicine in period between 2017 November and May 2018. The study was conducted according to the principles of the Declaration of Helsinki. All participants decided to join in the study and signed an informed consent form.

The sample size could be calculated as 2 to 20 patients per question for validity and reliability studies according to literature [13]. We planned to have 10 patients for each question in the questionnaire and a total of 50 patients (The SDSS consist of five items, so 5*10). The eligibility criteria were (1) 18-70 years of age, (2) diagnosis of DD by the orthopedic surgeon, (3) receiving no new treatment (ex. collagenase injections) between test-retest evaluations, (4) consent to participate, (5) the ability to adequately read and understand Turkish. Participants were excluded if they exhibited any of the following criteria: (1) any neurological deficit such as stroke, (2) any surgery with affected hand or finger/s.

For language validity, we translated the SDSS according to the guidelines for the process of cross-cultural adaptation of self-report measures [14]. The questionnaire was first translated into Turkish by three independent translators who were working as academicians. After the first translation, the translated questionnaire was back translated by other three researchers who are health professionals. The translators re-translated into English by two expert interpreters (one of them with native English) and they were not informed of the subject. This translation was compared with the original version of the questionnaire and checked for inconsistencies.

The Turkish versions of the questionnaire were revised by a squad including two translators, one orthopedic surgeon, one physiotherapist, and one academician in another area to assess the necessity of performing a cultural adaptation. They controlled the English and Turkish translations again to control the meaning differences and inconsistency and the questionnaire was composed after all. They decided to merge "inconvenience" and" troublesome" words as "rahatsızlık". Because "inconvenience" and "troublesome" might not be clearly conceived by the participants. It is difficult to distinguish the difference between these two words in daily usual Turkish language. This version was used in a pilot study before final version. A pilot study for pre-final Turkish version was completed with 10 patients and 10 healthy individuals. It was determined that there were no unclear questions based on application and participants' feedback. Therefore, the final version of the questionnaire was formed by unanimity. This version of SDSS was sent to developer author of SDSS and approved by him. Then, the test stage was initiated. The Turkish form of SDSS was provided in Appendix.

The demographic data such as age, gender, dominant extremity were recorded. All patients answered Quick DASH and SDSS-T by face-to-face at first assessment. Based on the original study, the SDSS-T was applied for second time three weeks later by phone conversation, for test-retest reliability.

The Disabilities of the Arm, Shoulder and Hand Score (Quick DASH)

The Quick DASH is a short version of the original DASH to measure physical function and symptoms in patients with musculoskeletal disorders of the upper limb. The questionnaire was developed by Beaton et al. in 2005 [15]. It consists of a disability/symptom scale (11 items) and beyond an optional work and sport dimensions. In disability/symptom scale, each item demands about the intensity of pain, activity-related pain, weakness and stiffness, a complication in performing physical activities because of upper extremity cause, the effect of upper extremity problem on social activities, work, and sleep. Two discretionary modules measure the ability to work and the ability to perform sports and/or play musical instruments [16]. Each item has 5 response options (no difficult, mild difficult, moderate difficult, severe difficult and unable). The overall score ranges from 0 (no disability) to 100 (most severe disability) points [17]. The validity and reliability of Turkish version of Quick DASH was reported by Koldaş et al [18].

The Southampton Dupuytren's Scoring Scheme (SDSS)

The SDSS is a scoring system for patients with DD. The SDSS was developed by Mohan et al. in 2014 [12]. The SDSS is a disease-specific scoring system for DD. The SDSS evaluates the degree difficulty of the patients during their daily routine activities such as personal care activities, hobbies, house works and etc. The SDSS also questions patients' feel how much discomfort due to DD. The questionnaire is a 5-point Likert-type scale, which consist of 5 items where the responses to the items are "No problem," "Minor convenience," "Modest convenience," "Definitely troublesome" and "Severe problem." The score of SDSS is ranged between 0 (no problem) and 20 (severe problem). There's not a cut-off value for SDSS.

Statistical Analysis

The analysis of the data was performed using the IBM Statistical Package for the Social Sciences (SPSS) version 22.0 for Windows. Statistical significance was expressed as mean ± standard deviation (X±SD), median or percent (%). The availability of data to normal distribution was tested using Kolmogorov-Smirnov analysis. Reliability of SDSS-T was assessed by internal consistency and test-retest reliability.

The test-retest was carried out during mobile phone interview in 25 patients by the same interviewer. An intra-class correlation coefficient (95% confidence interval) was used for the reliability analysis of the Turkish SDSS. Internal consistency was determined by calculating Cronbach's alpha coefficient. We measured the strength of consistency between repeated measures using the intra-class correlation coefficient (ICC), with ICC of 0.7 or greater representing a high level of consistency [19]. The correlation coefficients between SDSS-T and Quick DASH were evaluated as Spearman's correlation in order to evaluate structural validity. The results were evaluated at 95% confidence intervals and significance at $p < 0.05$ level.

RESULTS

Translation process and testing

The SDSS was successfully translated into Turkish and culturally adapted to Turkish culture. Pre-testing did not reveal any difficulties (Appx.)

Demographic characteristics

A total of 50 patients with DD (14 women and 36 men) were included in the study. The mean age of the participating patients was 61.52±8.51 years (min 37, max 70 years). In terms of education level, 44% of the patients are primary school and 26% are high school graduates. It was determined that 54% of the patients participating in the study had chronic disease. 38% of the patients were smokers. 94% of the patients use not alcohol. Positive family history was stated by two patients. Of the patients 70% (n=35) were using their right hand as a dominant hand and 30% (n=15) were using their left hand as a dominant hand. The affected fingers sorted by frequency were as follows: middle finger (n=27), ring finger (n=27), and both of them (ring and middle fingers, n=7). Scores of Quick DASH and SDSS-T and demographics data were summarized in Table 1.

Table 1. Demographic characteristics of subjects.

Total (n=60)	Mean ± SD (Min-Max)
Age (year)	61.52±8.51 (37-70)
Quick DASH	20.06±10.80 (8-52)
SDSS-T	10.10±0.97 (8-12)
	n (%)
Gender	
Female	14 (%28)
Male	36 (%72)
Affected finger(s)	
Middle finger	37 (%54)
Ring finger	16 (%32)
Middle and ring fingers	7 (%14)

SD: Standard deviation; Min: Minimum; Max: Maximum; Quick DASH: The Disabilities of the Arm, Shoulder and Hand Score; SDSS-T: Turkish version of the Southampton Dupuytren's Scoring Scheme.

Internal consistency

Descriptive statistics of SDSS-T scores and internal consistency were shown in Table 2. The internal consistency of SDSS-T was determined with Cronbach's alpha coefficient, which was 0.783 ($\alpha > 0.7$).

We determined the interclass correlation coefficients (ICC) for the first and the second tests as well as the Cronbach α coefficient. The ICC for the mean of all 5 items was 0.82 and the Cronbach α was 0.783.

Table 2. Internal consistency analysis Cronbach alpha results

Internal consistency analysis	Items	Cronbach's alpha value
SDSS-T	5	0.783

SDSS-T: Turkish version of the Southampton Dupuytren's Scoring Scheme

Test-retest reliability

25 patients completed the SDSS-T twice for testing the reproducibility. Second test was performed 3 weeks after the first one. The Spearman's rank correlation coefficient between the two tests was good (r=0.769; p<0.05), (Table 3).

Table 3. Test-retest reliability of SDSS-T.

Spearman's Rank Correlation Coefficient	Second test
First test	0.769*

*p<0.05

Convergent Validity

The correlations between the total scores of the SDSS-T questionnaire and the total scores of Quick DASH was positively but not statistically significant (r=0.573, p>0.05).

DISCUSSION

The purpose of this study was to establish the validity of the Turkish version of the SDSS in patients with DD. Our results indicate that Turkish SDSS is a reliable and valid instrument for studying outcomes in patients with DD. In the current study, internal consistency and test-retest reliability indicated the excellent reliability of the Turkish version of the SDSS. Testing the construct validity revealed moderate to strong correlation between SDSS-T and the Quick DASH. From this study it can be concluded that the English SDSS has been successfully translated and culturally adapted into Turkish.

The original SDSS has been developed as a disease specific questionnaire. The Quick DASH is one of the frequently used questionnaires in studies but in DD, patients do not suffer pain compared to rheumatologic diseases. As known, the Quick DASH questionnaire includes items related to pain, so it is presumably unavailable and hard to understand for patients self-assessing DD associated disability [8].

The SDSS measures disability and outcome of treatment of patients with DD. In this questionnaire which comprises 5 items, patients reply to the survey items using a 5-point scale (0-4), which allows patients to express themselves in the circumstance and enables the detection of both minor and substantial changes in an individual's health [20,21]. So, the number of items is an advantage as well as. It has seen obviously that SDSS can be answered in a short time in the clinic and academic studies.

We compared the SDSS-T with Quick DASH to test the construct validity, using Spearman's rank correlation coefficient. In original study, researchers used this questionnaire which is based on patient's perception of disease. We found a good correlation between two scoring system but it was not statistically significant. This result was important for clinical value. Because pain has rarely seen in DD. However, the Quick DASH which is based on pain-related physical disability is a questionnaire.

We tested the reliability of our questionnaire using Cronbach's alpha coefficient and internal consistency. At first, twenty-five patients were applied the retest, the reliability of the scale was determined by applying the questionnaire twice. The test-retest correlation coefficient was 0.769. Then reliability of internal consistency was investigated and it was seen that the coefficient ranges between 0 and 1. In the present study, reliability results were well-considered to be for all items and values compared to what was obtained from the original version.

The Cronbach's alpha was 0.783 in the present study and 0.873 by Mohan et al. in the original version [12].

We found that the reliability and validity of the Turkish version of SDSS (SDSS-T) is satisfying and can be used as a valid and reliable measure in patients with DD.

There are some limitations to our study. First of all, this is a single-center study, which may not represent the general patient population. The other one, in the study, we evaluated patients with DD who had yet any surgery for DD treatment. So, in future studies may be useful to compare the results with the postoperative period. The other also the clinical assessment could be more comprehensive with some objective scores such as deficits of extension, Tubiana scores.

In conclusion, it was found that the SDSS-T is a valid and reliable questionnaire for assessment in Turkish DD patients. It is short and understandable questionnaire. The SDSS-T have also some advantages such as patient-oriented focus and easy data obtaining in routine clinical. Therefore, the SDSS-T is suggested as an outcome measure for assessing to patients with DD in routine clinically.

Appendices

Appx. Turkish version of the SDSS.

REFERENCES

1. Soreide E, Murad MH, Denbeigh JM, et al. Treatment of Dupuytren's contracture: a systematic review. Bone Jt J. 2018; 100: 1138-1145.
2. Khan AA, Rider OJ, Jayadev CU, et al. The role of manual occupation in the aetiology of Dupuytren's disease in men in England and Wales. J Hand Surg. 2004; 29: 12-14.
3. Hindocha S, McGrouther DA, Bayat A. Epidemiological evaluation of Dupuytren's disease incidence and prevalence rates in relation to etiology. Hand. 2009; 4: 256-269.
4. Shih B, Bayat A. Scientific understanding and clinical management of Dupuytren disease. Nat Rev Rheumatol. 2010; 6: 715-726.
5. Beaudreuil J, Allard A, Zerkak D, et al. Unité Rhumatologique des Affections de la Main (URAM) scale: development and validation of a tool to assess Dupuytren's disease–specific disability. Arthritis Care Res. 2011; 63: 1448-1455.
6. Hudak PL, Amadio PC, Bombardier C. Development of an upper extremity outcome measure: The DASH (Disabilities of the Arm, Shoulder and Hand). Am J Ind Med. 1996; 29: 602-608.
7. Beaton DE, Katz JN, Wright JG. Development of the QuickDASH: comparison of three item reduction approaches. J Bone Jt Surg. 2005; 87: 1038-1046.
8. Chung KC, Pillsbury MS, Walters MR, et al. Reliability and validity testing of Michigan Hand Outcomes Questionnaire. J Hand Surg. 1998; 23: 575-587.
9. Macey AC, Burke FD. Outcomes of hand surgery. J Hand Surg. 1995; 20: 841-855.
10. Levine DW, Simmons BP, Koris MJ, et al. A self-administered questionnaire for the assessment of severity of symptoms and functional status in carpal tunnel syndrome. J Bone Jt Surg. 1993; 75: 1585-1592.
11. Amadio PC, Berquist TH, Smith DK, et al. Scaphoid malunion. J Hand Surg. 1989; 14: 679-687.
12. Mohan A, Vadher J, Ismail H, et al. The Southampton Dupuytren's scoring scheme. J Plast Surg Hand Surg. 2014; 48: 28-33.
13. Anthoine E, Moret L, Regnault A, et al. Sample size used to validate a scale: a review of publications on newly-developed patient reported outcomes measures. Health Qual Life Outcomes. 2014; 12: 176-185.
14. Acquadro C, Conway K, Hareendran A, et al. Literature review of methods to translate health-related quality of life questionnaires for use in multinational clinical trials. Value in Health. 2008; 11: 509-521.
15. Beaton DE, Wright JG, Katz JN. Upper Extremity Collaborative Group. Development of the Quick-DASH: Comparison of three item-reduction approaches. J Bone Jt Surg. 2005; 87: 1038-1046.
16. Greenslade JR, Mehta RL, Belward P, et al. Dash and Boston questionnaire assessment of carpal tunnel syndrome outcome: what is the responsiveness of an outcome questionnaire? J Hand Surg. 2004; 29: 159-164.
17. Iordens GIT, Den Hartog D, Tuinebreijer WE, et al. Minimal important change and other measurement properties of the Oxford Elbow Score and the Quick Disabilities of the Arm Shoulder, and Hand in patients with a simple elbow dislocation; validation study alongside the multicenter FuncSiE trial. PLoS One. 2017; 12: e0182557.
18. Koldas Dogan S, Ay S, Evcik D, et al. Adaptation of Turkish version of the questionnaire Quick Disability of the Arm, Shoulder, and Hand (Quick DASH) in patients with carpal tunnel syndrome. Clin Rheumatol. 2011; 30: 185-191.
19. Norholm V, Bech P. The WHO quality of life (WHOQOL) questionnaire: Danish validation study. Nordic J Psych. 2001; 55: 229-235.
20. Fayad F, Lefevre-Colau MM, Macé Y, et al. Validation of the French version of the arm, shoulder and hand questionnaire (F-DASH). Jt Bone Spine. 2008; 75: 195-200.
21. Pap G, Angst F, Herren D, et al. Evaluation of wrist and hand handicap and postoperative outcome in rheumatoid arthritis. Hand Clin. 2003; 9: 471-481.