



Reliability and validity of culturally adapted Turkish Short Musculoskeletal Function Assessment questionnaire (SMFA-TR)

Bedri Karaismailoglu¹ | Salih Candost Yetismis¹ | Gokhan Kaynak¹ |
Berna Karaismailoglu²

¹Department of Orthopedics and Traumatology, Cerrahpasa Medical Faculty, Istanbul University-Cerrahpasa, Istanbul, Turkey

²Department of Infectious Diseases and Clinical Microbiology, Ayancik State Hospital, Sinop, Turkey

Correspondence

Bedri Karaismailoglu, Istanbul Üniversitesi-Cerrahpasa, Ortopedi ve Travmatoloji Anabilim Dalı, İstanbul, Türkiye, 34098.
Email: bedrikio@hotmail.com

Abstract

Aim: This study aimed to culturally adapt and validate the Turkish version of the Short Musculoskeletal Function Assessment Questionnaire (SMFA-TR) which primarily assesses the functional status of patients.

Methods: The translation and cross-cultural adaptation of SMFA to Turkish was made by the standardized procedure and tested for clinimetric quality. The following analyses were made to evaluate clinimetric quality of the SMFA-TR: reliability with factor analysis and Chronbach's α (construct validity), correlations between SMFA-TR and Short Form (SF)-36 (concurrent validity), test-retest reliability (intraclass correlation analyses), floor and ceiling effects. The questionnaire was applied to 166 patients with musculoskeletal problems. All patients filled in the SMFA-TR and the validated Turkish SF-36 questionnaire. Forty-two patients returned to complete the same questionnaires at 10 days.

Results: Factor analysis revealed a 4-factor structure of the SMFA-TR. Cronbach's α values were over 0.88 for both original subscales (dysfunction and bother) of the SMFA. Internal consistency (0.88-0.94) and test-retest reliability coefficients (0.90-0.98) were high for both subscales. Turkish SF-36 questionnaire conventional subscales showed significant correlations with SMFA-TR subscales. No floor or ceiling effects were found.

Conclusion: The Turkish version of the SMFA was found to be reliable and valid for Turkish-speaking patients with musculoskeletal injuries or disorders.

KEYWORDS

cross-cultural adaptation, reliability, short musculoskeletal function assessment, Turkish, validity

1 | INTRODUCTION

Musculoskeletal diseases are a major health problem causing significant loss of labor and an important increase in health expenses. Studies in this field are increasing day by day. Patient-reported

outcome measures are effective tools summarizing the patients' functional status. However, the fact that most of these measurements are developed in English makes it difficult to apply these measurements to patients with different native languages. In this sense, widely preferred questionnaires are being translated into different



languages and culturally adapted to provide a tool for determining the results of the patient groups in different regions and comparing them with other populations. There are numerous questionnaires available in the literature to assess the function of a specific region (Disabilities of the Arm, Shoulder and Hand; Oxford Knee Score, etc) or evaluating the patient's general functional status (short Form [SF]-36, Short Musculoskeletal Functional Assessment [SMFA] etc).¹⁻⁴ SMFA is a widely preferred tool for the functional assessment of patients since it can be applied to different patient groups and patients with multiple injuries.^{4,5}

The main advantage of SMFA over the other patient-reported health outcome scales is the ability to assess whole body parts rather than a specific region. Most of the functional assessment scales are prepared as region-specific and when multiple injuries exist, they might not be helpful. Additionally, it is not possible to report the complete health status of the patients by just their physical status. SMFA provides information about how the functional status of the patients affects their emotional status by the questions included in the "bother index". This is also a distinctive feature of the questionnaire compared to other scales.

SMFA, which has been translated and culturally adapted to several languages,⁶⁻¹¹ does not have a version in the Turkish language, which has over 70 million native speakers. This prevents the use of SMFA in Turkish-speaking patients and assessing their functional and emotional status. Therefore, it is not also possible to compare the treatment outcomes of the Turkish population to other nationalities who were evaluated by SMFA. In this study, we aimed to translate, culturally adapt and validate a Turkish version of SMFA. Thus, it will be possible to evaluate the functional outcomes of Turkish-speaking patients for both patient follow up and clinical research.

2 | MATERIALS AND METHODS

2.1 | Translation and cross-cultural adaptation

The permission from Swiontkowski et al⁴ who developed the original questionnaire, was obtained to culturally adapt the SMFA questionnaire to Turkish and test its validity and reliability. The guideline of the American Academy of Orthopedic Surgeons for the cross-cultural adaptation of health status measures¹² was utilized during the translation and cross-cultural adaptation of the SMFA questionnaire. The forward translation was made by two bilingual translators, whose native language is Turkish. One of the translators had a medical background and was aware of the study while the other translator did not have a medical background and was not aware of the study. After the forward translations were obtained, two translators discussed the differences and a synthesis from these translations was formed. Then, the backward translation of the questionnaire to English was made by 2 bilingual translators, whose native language is English. Again, one of the translators had a medical background and was aware of the study while the other was not.

The expert committee, which includes a methodologist, 3 health professionals, 2 language professionals and 4 translators (2 forward and 2 backward translators), discussed and produced the pre-final version of the questionnaire. The content validity of each survey item in SMFA-TR was assessed by the expert committee on a 4-point Likert scale where 1 meant not relevant, 2 somewhat relevant, 3 moderately relevant, and 4 very relevant. Ethics approval from the local ethics committee was obtained before the study to apply the questionnaire to the patients (ethical approval number: 605.02.23). A pilot study on 20 patients with musculoskeletal diseases was conducted to test the pre-final version of SMFA-TR. The patients were asked if they found any question difficult or confusing. All patients found the questions easily understandable. Some minor changes were made by the expert committee according to patient feedback. The final version was approved by the expert committee (Appendix A).

2.2 | Study design

The questionnaire was applied to 166 patients who were referred to the outpatient clinic with musculoskeletal injuries or disorders, between 18 and 65 years old and a native-speaker of Turkish language, between July and December 2017. Patients with neuromuscular disorders, neurological dysfunction, cancer, comorbidity restricting functional status, reading or writing disabilities, cognitive or psychiatric disorders, were excluded.

2.3 | Instruments

The participants were administrated 2 questionnaires: SMFA-TR and SF-36. The SMFA questionnaire which was developed by Swiontkowski et al is an important patient-reported outcome measure tool being used frequently in the evaluation of a broad range of musculoskeletal diseases.⁴ It includes 2 subscales (dysfunction and bother) and 46 questions. "Dysfunction Index" consisting of 34 questions examines the difficulties experienced by patients during their activities under 4 subcategories (daily activities, emotional status, function of the arm and hand, mobility), while "bother index" consisting of 12 questions examines how much the patients are bothered by their functional problems. Therefore, SMFA also provides information about the emotional status of the patients in addition to physical function. This is an important feature of SMFA, distinguishing it from the other physical function outcome scales. While the score ranges from 0 to 100, higher scores indicate poorer function.

The SF-36 is a 36-item, patient-reported survey which gives an opinion about health-related quality of life. The SF-36 consists of 8 subcategories including general health, physical function, social function, mental health, physical role, emotional role, bodily pain, and vitality. The sum of the scores ranges between 0 and 100; lower scores indicate more disability. The SF-36 Turkish version has been tested for reliability, validity, and applicability.¹³



2.4 | Statistical analysis

The Statistical Package of Social Science (SPSS), version 22.0, was used to analyze the data. *P* values less than .05 were considered significant. Demographic analysis of the study group was made by descriptive analyses employing means and percentages with 95% confidence intervals (CIs). Frequency, means and standard deviations (SD) were calculated for the variables. The final Turkish version of the questionnaire was tested for clinimetric characteristics including factor analysis, internal consistency, concurrent validity, retest reliability, and floor and ceiling effects (content validity).

2.5 | Validity

Validity is defined as the ability of an instrument to measure what it is intended to measure. Concurrent validity was determined by comparing the scores of SMFA-TR to the Turkish version of SF-36. Between the indices of the SMFA-TR and the related subscales of the SF-36, Spearman's Rho correlation coefficients were calculated. Spearman's correlation coefficients were interpreted as follows: little = 0.00-0.25; weak = 0.26-0.49; moderate = 0.50-0.69; strong = 0.70-0.89; very strong = 0.90-1.00.¹⁴

The ceiling and floor effects of SMFA-TR were also analyzed by percentage frequency of the lowest or highest possible score obtained. The participants with the lowest or highest possible scores prevent the correct measurement of validity and reliability. The ceiling and floor effects of more than 15% were considered significant.⁶

2.6 | Reliability

Reliability is the ability of an instrument to create reproducible results. Exploratory factor analysis was performed on all SMFA-TR items by principal component analyses with varimax rotation. The factor loading values more than 0.4 were accepted as significant.¹⁵ Internal consistency was examined with factor analysis and Cronbach's α for each subscale. A Cronbach's α of at least 0.70 was considered acceptable and less than 0.70 was considered low.¹⁶ Forty-eight patients who did not receive any intervention in 10 days after their first referral to the outpatient clinic, due to ongoing laboratory or radiological tests, were requested to participate in test-retest reliability 10 days after the first assessment. Forty-two of them returned the questionnaires. Intraclass correlation coefficients (ICC) with corresponding 95% CIs were calculated to examine retest reliability.

3 | RESULTS

3.1 | Demographic and clinical characteristics

A total of 166 patients (92 male, 74 female) with various musculoskeletal injuries and disorders participated in this study. The mean

TABLE 1 Demographic and clinical characteristics of the participants

Characteristics	N = 166
Gender (%)	92 male (55.5%), 74 female (44.5%)
Age, mean (SD, range)	42 (\pm 9.8, 18-64)
Body mass index, kg/m ² , mean (SD)	21.5 (\pm 3.9)
Education level (%)	
Elementary school	32 (19.3%)
High school	63 (37.9%)
College or higher	71 (42.8%)
Marital status	
Single	44 (26.5%)
Married	67 (40.4%)
Married and have children	55 (33.1%)
Location (%)	
Upper extremity	46 (27.7%)
Lower extremity	55 (33.1%)
Pelvis	21 (12.6%)
Spine	36 (21.6%)
Multiple	8 (4.8%)
Diagnosis (%)	
Soft tissue contusion	44 (26.5%)
Fracture	32 (19.3%)
Osteoarthritis	35 (21.1%)
Tendinitis	21 (12.6%)
Chronic condition of the spine	23 (13.8%)
Other	11 (6.6%)

age of the patients was 42 ± 9.8 years (range 18-64). An important majority of the patients (80.7%) had at least a high school degree. Most of the patients were married (73.5%). The patients had various diagnoses including soft tissue contusion (26.5%), fracture (19.3%), osteoarthritis (21.1%), tendinitis (12.6%) and chronic conditions of the spine (13.8%). The demographic and clinical characteristics of the patients are given in Table 1.

3.2 | Clinimetric characteristics

The Kaiser-Meyer-Olkin value was 0.94, indicating the factor analysis was appropriate and the variables were correlated. Factor analyses revealed that the 4-factor construct was the most appropriate with 70.8% of the variance when compared to 2, 3 or 5-factor solutions. All items of SMFA-TR loaded on 1 of the 4 factors ranging between 0.51 and 0.93 (Appendix B). The newly identified subscales included upper extremity dysfunction (7 items), mobility (10 items), daily activities (21 items), and mental and emotional problems (8 items; Table 2). Cronbach's α was 0.90 (95% CI 0.88-0.94) for the dysfunction index and 0.91 (95% CI 0.89-0.94) for the bother index.

TABLE 2 Spearman's rank correlation coefficients between the SMFA-TR indices and the Turkish SF-36 subscales

SMFA-TR	Turkish SF-36							
	General health	Physical function	Social function	Mental health	Physical role	Emotional role	Bodily pain	Vitality
Dysfunction	0.57	0.76	0.71	0.54	0.62	0.54	0.58	0.59
Bother	0.58	0.70	0.72	0.57	0.65	0.52	0.62	0.55
Total index	0.57	0.73	0.71	0.59	0.63	0.52	0.60	0.56
Upper extremity dysfunction ^a	0.42	0.46	0.56	0.43	0.55	0.35	0.47	0.51
Mobility ^a	0.64	0.68	0.62	0.36	0.59	0.46	0.56	0.42
Daily activities ^a	0.44	0.79	0.55	0.32	0.68	0.47	0.66	0.57
Mental and emotional problems ^a	0.54	0.46	0.59	0.65	0.55	0.62	0.49	0.53

Note: The values were interpreted as follows: little = 0.00-0.25; weak = 0.26-0.49; moderate = 0.50-0.69; strong = 0.70-0.89; very strong = 0.90-1.00.

Abbreviations: SF-36, Short Form 36SMFA-TR, Short Musculoskeletal Function Assessment-Turkish.

^aNewly identified subscales after the factor analysis.

When newly identified subscales were evaluated, Cronbach's α values were 0.90 for upper extremity dysfunction, 0.91 for mobility, 0.94 for daily activities and 0.88 for mental and emotional problems. Both values were satisfactory for internal consistency reliability.

The SMFA-TR categories and the subscales of the SF-36 showed moderate to strong correlations in all comparisons. The strongest correlations were with physical function and social function in both dysfunction and bother indices of SMFA-TR, while the other subscales of SF-36 showed moderate correlations (Table 2). ICC for retest reliability of dysfunction (0.96) and Bother (0.93) indices between the 1st and 10th days were high (Table 3). There was no minimum "0" score of the SMFA-TR, which indicates the best functional status was recorded; and no maximum "100" score of the SMFA-TR, which indicates the worst functional status was recorded. Overall, no floor or ceiling effect was found for any of the subscales of the SMFA.

4 | DISCUSSION

This study aimed to culturally adapt and validate the Turkish version of SMFA to provide a useful instrument in evaluating the functional outcomes of Turkish-speaking patients. SMFA-TR showed sufficient reliability, validity and repeatability to be used as an instrument in assessing the functional status and life quality of Turkish patients with a wide variety of musculoskeletal injuries or disorders. All original and factor analysis-identified subscales of the SMFA-TR demonstrated adequate internal reliability and showed good correlation with respective subscales of the validated Turkish SF-36.¹³

Cronbach's α values for the SMFA-TR were excellent in both conventional subscales: 0.90 for the dysfunction and 0.91 for the bother index. These results indicate that SMFA-TR has good reliability, similar to the results of the initial validation of the original SMFA⁴ as well as other studies validating some other language versions.^{7,8,11,17}

Wollmerstedt et al reported Cronbach's α values between 0.88-0.97 for both indices of the German version of SMFA (SMFA-D) in all their patient groups including osteoarthritis of the hip or knee, rheumatoid arthritis or rotator cuff tear undergoing surgical or medical inpatient treatment.¹¹ Ponzer et al found Cronbach's α values of 0.94 for the dysfunction index and 0.90 for the bother index in their study with the Swedish version of SMFA (SMFA-Swe).⁷ Bohm et al reported Cronbach's α values of 0.93 and 0.88 for dysfunction and bother indices with the German version of SMFA in their study with patients undergoing rotator cuff repair.¹⁷ Taylor et al reported similar Cronbach's α values for the Brazilian Portuguese version of SMFA (SMFA-BR) (0.95 for the dysfunction and 0.91 for the Bother indices) in their patient group with various musculoskeletal diseases which was similar to our patient group.⁸ Our results showed that SMFA-TR is an internally consistent tool and has high reliability.

We compared both the conventional and newly identified subscales of the SMFA-TR with all subscales of Turkish SF-36, to investigate the concurrent validity. Both indices of the SMFA-TR showed a good correlation with the original subscales of Turkish SF-36. Physical function and social function subscales of SF-36 showed strong correlations in both dysfunction and bother indices of SMFA-TR, while the other subscales of SF-36 showed moderate correlations. When newly identified subscales were evaluated, some of the correlations were weak, especially in upper extremity problems and mobility scales. This might be due to the broad range of questions in SMFA-TR assessing the patient as a whole, preventing it to be used for the outcomes of specific parts of the body. These results were comparable to the original SMFA validation study by Swiontkowski et al⁴ and several other translated versions of the SMFA.^{6,8,17-19}

Swiontkowski et al found significant correlations between both indices of original SMFA and all subscales of SF-36.⁴ In the study by Taylor et al, the strongest correlation was also with the physical function subscale of SF-36 for both indices of SMFA-BR.⁸

**TABLE 3** Descriptive statistics and repeatability measures of the SMFA-TR (N = 42)

	Baseline mean (SD)	Retest mean (SD)	Mean difference (95% CI)	ICC (95% CI)	SEM
Dysfunction index	17.6 (13.4)	17.1 (14.5)	0.5 (−1.2–1.7)	0.96 (0.93–0.98)	4.23
Bother index	21.9 (16.5)	23.2 (19.2)	1.3 (−0.3–1.9)	0.93 (0.90–0.95)	6.02
Total index	39.5 (15.1)	40.3 (16.8)	0.8 (−0.6–1.8)	0.94 (0.91–0.96)	7.18

Abbreviations: CI, confidence interval; ICC, intraclass correlation coefficient; SD, standard deviation; SEM, standard error of measurement; SMFA-TR, Short Musculoskeletal Function Assessment-Turkish.

Reininga et al found strong relationship between both dysfunction and bother indices of SMFA-NL and physical function, physical role, and bodily pain subscales of the SF-36, while they found moderate correlations with the SF-36 subscales social function and vitality.⁶ Reininga et al also found a 4-factor solution and they also showed weak correlations between upper and lower extremity problem subscales of SMFA-NL and subscales of SF-36. Brazilian Portuguese and Spanish versions of SMFA found 3-factor solutions, but several items of these versions did not load on 1 of the 3 factors.^{8,10} However, all items of SMFA-TR loaded into the 4-factor solution. The Chinese version of SMFA identified 6 different subscales.¹⁸

Bohm et al reported significant correlations among the SMFA-D Bother and Function indices and all subscales of SF-36 except physical role.¹⁷ The highest correlation was reported between the dysfunction index of SMFA-D and the physical function subscale of SF-36 (0.76) and between the bother index of SMFA-D and the physical function subscale of SF-36 (0.63). However, 1 year postoperatively, both indices of SMFA-D showed a significant correlation with all SF-36 subscales. Kirschner et al also found a significant relationship between both SMFA-D subscales and all SF-36 subscales in a prospective study of 63 patients with primary knee osteoarthritis.¹⁹

ICC of the dysfunction index was 0.96, while it was 0.93 for the bother index between the 1st and 10th days, indicating a good test-retest reliability. The original SMFA validation study demonstrated similar values (0.93 and 0.88 for the dysfunction and bother indices, respectively) at average 7.8 days in 150 patients with various musculoskeletal disorders.⁴ The other several translated versions of the SMFA also showed comparable results.^{6–8} Taylor et al reported high ICC values (0.97–0.99) for retest reliability at 1 and 7 days in SMFA-BR.⁸ In their evaluation of 63 patients with a stable orthopedic condition, Ponzer et al found ICC values of 0.93 and 0.88 for the dysfunction index and bother index of the SMFA-Swe, respectively.⁷ Reininga et al reported ICC values ranging between 0.91–0.96 with their cross-culturally adapted Dutch version of SMFA (SMFA-NL).⁶

Although there are some studies reporting ceiling effects,^{4,6,17} we found no floor or ceiling effects for any of the SMFA-TR subscales, similar to the study by Lindahl et al.⁹ We think the most probable reason behind the ceiling effects in other studies was including healthy patients or patients with long follow-ups after their conservative treatment or surgery. For example; Reininga et al included patients with up to 2 years follow up after their surgical treatment.⁶ In

our patient group; all patients referred to the outpatient clinic had an acute or chronic complaint. This was the possible reason behind the “no ceiling effect” in our study.

To the best of our knowledge; this study is the first to culturally adapt the SMFA into a Turkish version and evaluate its validity and reliability. However, the lack of responsiveness evaluation is an important limitation to this study and it should be analyzed in future research. Item analysis and confirmatory factor analyses were also not evaluated. Concurrent validity was evaluated only with the SF-36 questionnaire, which can also be counted as one of the limitations of this study. However, since the SMFA is not a region-specific questionnaire, several studies also used the same methodology, including the validation study of the original SMFA questionnaire.^{4,8,9}

5 | CONCLUSION

The reliability, validity and repeatability of SMFA-TR were found sufficient to assess the functional status of Turkish-speaking patients with musculoskeletal problems. This study will provide a valid questionnaire for Turkish-speaking patients and will aid further research on patients with musculoskeletal disabilities.

AUTHOR CONTRIBUTIONS

Bedri Karaismailoglu: design of the study, interpretation of the results and writing the manuscript. Salih Candost Yetismis: data collection. Gokhan Kaynak, Berna Karaismailoglu: interpretation of the results and reviewing the manuscript.

ORCID

Bedri Karaismailoglu  <https://orcid.org/0000-0002-4565-6383>

REFERENCES

1. Dogan SK, Ay S, Evcik D, Baser O. 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(2):185–191.
2. Tuğay BU, Tuğay N, Güney H, Kinikli GI, Yüksel I, Atilla B. Oxford knee score: Cross-cultural adaptation and validation of the Turkish version in patients with osteoarthritis of the knee. *Acta Orthop Traumatol Turc*. 2016;50(2):198–206.
3. Çelik D, Short ÇÖ. Form Health Survey version-2.0 Turkish (SF-36v2) is an efficient outcome parameter in musculoskeletal research. *Acta Orthop Traumatol Turc*. 2016;50(5):558–561.



4. Swiontkowski MF, Engelberg R, Martin DP, Agel J. Short musculoskeletal function assessment questionnaire: validity, reliability, and responsiveness. *J Bone Joint Surg Am*. 1999;81:1245-1260.
5. Agel J, Obremsky W, Kregor P, et al. Administration of the short musculoskeletal function assessment: impact on office routine and physician-patient interaction. *Orthopedics*. 2003;26:783-788; discussion 788.
6. Reininga IHF, El Moumni M, Bulstra SK, Olthof MGL, Wendt KW, Stevens M. Cross-cultural adaptation of the Dutch Short Musculoskeletal Function Assessment questionnaire (SMFA-NL): Internal consistency, validity, repeatability and responsiveness. *Injury*. 2012;43(6):726-733.
7. Ponzer S, Skoog A, Bergström G. The Short Musculoskeletal Function Assessment Questionnaire (SMFA): Cross-cultural adaptation, validity, reliability and responsiveness of the Swedish SMFA (SMFA-Swe). *Acta Orthop Scand*. 2003;74(6):756-763.
8. Taylor MK, Pietrobon R, Menezes A, et al. Cross-cultural adaptation and validation of the Brazilian Portuguese version of the Short Musculoskeletal Function Assessment Questionnaire: The SMFA-BR. *J Bone Jt Surg*. 2005;87(4):788-794.
9. Lindahl M, Andersen S, Joergensen A, Frandsen C, Jensen L, Benedikz E. Cross-cultural adaptation and validation of the Danish version of the Short Musculoskeletal Function Assessment questionnaire (SMFA). *Qual Life Res*. 2018;27(1):267-271.
10. Guevara CJ, Cook C, Pietrobon R, et al. Validation of a Spanish version of the Short Musculoskeletal Function Assessment Questionnaire (SMFA). *J Orthop Trauma*. 2006;20(9):623-629.
11. Wollmerstedt N, Kirschner S, Faller H, König A. Reliability, validity and responsiveness of the German short musculoskeletal function assessment questionnaire in patients undergoing surgical or conservative inpatient treatment. *Qual Life Res*. 2006;15(7):1233-1241.
12. Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines. *J Clin Epidemiol*. 1993;46(12):1417-1432.
13. Koçyiğit H, Aydemir Ö, Fişek G, Ölmez N, Memiş A. Reliability and validity of Turkish version of Short form 36: a study of patients with rheumatoid disorder. [in Turkish] *J Drug Ther*. 1999;12:102-106.
14. Domholdt E. *Physical Therapy Research, Principles and Applications*, 2nd edn. Philadelphia: WB Saunders; 2000.
15. Guadagnoli E, Velicer WF. Relation of sample size to the stability of component patterns. *Psychol Bull*. 1988;103(2):265-275.
16. Terwee CB, Bot SDM, de Boer MR, et al. Quality criteria were proposed for measurement properties of health status questionnaires. *J Clin Epidemiol*. 2007;60(1):34-42.
17. Böhm TD, Kirschner S, Köhler M, et al. The German Short Musculoskeletal Function Assessment questionnaire: Reliability, validity, responsiveness, and comparison with the Short Form 36 and Constant score - A prospective evaluation of patients undergoing repair for rotator cuff tear. *Rheumatol Int*. 2005;25(2):86-93.
18. Wang Y, He Z, Lei L, et al. Reliability and validity of the Chinese version of the Short Musculoskeletal Function Assessment questionnaire in patients with skeletal muscle injury of the upper or lower extremities. *BMC Musculoskelet Disord*. 2015;16(1):161.
19. Kirschner S, Walther M, Böhm D, et al. German short musculoskeletal function assessment questionnaire (SMFA-D): comparison with the SF-36 and WOMAC in a prospective evaluation in patients with primary osteoarthritis undergoing total knee arthroplasty. *Rheumatol Int*. 2018;23(1):15-20.

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APPENDIX A

Short Musculoskeletal Function Assessment – Turkish (SMFA-TR)

KISA KAS-İSKELET SİSTEMİ FONKSİYON
DEĞERLENDİRME ANKETİ (SMFA-TR)

Açıklamalar

- Yaralanmanız (sakatlığınız) veya eklem rahatsızlığınızın bu hafta sizi nasıl etkilediğini ve günlük aktivitelerinizde yaralanmanız (sakatlığınız) veya eklem rahatsızlığınıza bağlı yaşadığınız problemleri bilmek istiyoruz.
- Lütfen tüm soruları, sizi en iyi tarif eden seçeneğin yanındaki kutucuğa işaret koyarak yanıtlayınız.
- Herhangi bir soruya yorum yapmak isterseniz, lütfen kenarlardaki boşlukları kullanınız.
- Bazı sorular yaralanmanız (sakatlığınız) veya eklem rahatsızlığınızla ilgili olmasa bile lütfen tüm sorulara cevap veriniz.

BU SORULAR, YARALANMANIZ
(SAKATLIĞINIZ) VEYA EKLEM
RAHATSIZLIĞINIZ SEBEBİYLE BU HAFTA
GÜNLÜK AKTİVİTELERİNİZDE NE KADAR
ZORLUK YAŞADIĞINIZ HAKKINDADIR

1. Alçak bir sandalyeye oturmak veya alçak bir sandalyeden kalkmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. İlaç şişelerini veya kavanozları açmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Gıda veya diğer şeyler için alışveriş yapmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Merdiven çıkmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Sıkı bir yumruk yapmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Bir kuvvete veya duşa girmek ya da bir kuvvetten veya duştan çıkmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Rahat bir uyku almak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Öne eğilmek veya diz çökmek sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Düğme, çitçit, çengel ya da fermuarları kullanmak sizin için ne kadar zor?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Kendi tırnaklarınızı kesmek sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Kendi kendinize giyinmek sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Yürümek sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Bir süre oturduktan veya uzandıktan sonra yürümek sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. Kendi başınıza dışarı çıkmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. Araba sürmek sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. Banyo esnasında kendi temizliğinizi yapmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. Tokmakları veya kolları çevirmek (örneğin; kapı tokmağını çevirerek kapıyı açmak veya cam açma kolunu çevirerek araba camını açmak) sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. Kalemle veya tuşlara basarak yazı yazmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. Tek ayak üzerinde dönme hareketi yapmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. Bisiklet sürme, yürüyüş ya da koşu gibi her zamanki eğlence amaçlı fiziksel aktivitelerinizi yapmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21. Hobiler, el sanatları, bahçe işleri, kart oyunları ya da arkadaşlarınızla dışarı çıkma gibi her zamanki boş zaman aktivitelerinizi yapmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. Cinsel aktivitelerinizde ne kadar zorluk yaşıyorsunuz?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

23. Toz alma, bulaşık yıkama ya da çimleri sulama gibi hafif ev veya bahçe işlerini yapmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

24. Yerleri yıkama, süpürme ya da çim biçme gibi ağır ev veya bahçe işi yapmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25. Ücret karşılığı çalıştığınız iş, ev işleri ya da gönüllü aktiviteler gibi her zamanki işlerinizi yapmak sizin için ne kadar zordur?

Hiç Zor Değil	Biraz Zor	Orta Derecede Zor	Çok Zor	Yapmak Olanaksız
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SIRADAKİ SORULAR YARALANMANIZ (SAKATLIĞINIZ) VEYA EKLEM RAHATLIĞINIZ SEBEBİYLE BU HAFTA NE SIKLIKTA PROBLEMLER YAŞADIĞINIZI SORGULAMAKTADIR

26. Ne sıklıkta topallayarak yürürsünüz?

Hiçbir Zaman	Çok Az Bir Zaman	Bazı Zamanlar	Çoğu Zaman	Her Zaman
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

27. Ağrılı uzvunuzu (uzuvlarınızı) ya da sırtınızı kullanmaktan ne sıklıkta kaçınırsınız?

Hiçbir Zaman	Çok Az Bir Zaman	Bazı Zamanlar	Çoğu Zaman	Her Zaman
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

28. Bacağınızda ne sıklıkta kilitlenme ya da boşalma hissedersiniz?

Hiçbir Zaman	Çok Az Bir Zaman	Bazı Zamanlar	Çoğu Zaman	Her Zaman
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

29. Ne sıklıkta konsantrasyon problemi yaşıyorsunuz?

Hiçbir Zaman	Çok Az Bir Zaman	Bazı Zamanlar	Çoğu Zaman	Her Zaman
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

30. Bir gün içinde çok fazla şey yapmak bir sonraki gün yapacaklarınızı ne sıklıkta etkiliyor?

Hiçbir Zaman	Çok Az Bir Zaman	Bazı Zamanlar	Çoğu Zaman	Her Zaman
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

31. Ne sıklıkta çevrenizdekilere karşı asabi davranırsınız? (örneğin; insanları terslemek, iğneli cevaplar vermek veya kolayca eleştirmek gibi)

Hiçbir Zaman	Çok Az Bir Zaman	Bazı Zamanlar	Çoğu Zaman	Her Zaman
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

32. Ne sıklıkta yorgun hissediyorsunuz?

Hiçbir Zaman	Çok Az Bir Zaman	Bazı Zamanlar	Çoğu Zaman	Her Zaman
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

33. Ne sıklıkta kendinizi engelli (sakat) hissediyorsunuz?

Hiçbir Zaman	Çok Az Bir Zaman	Bazı Zamanlar	Çoğu Zaman	Her Zaman
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

34. Bu yaralanmanız (sakatlığınız) veya eklem rahatsızlığı sebebiyle kendinizi ne sıklıkta kızgın veya hüsrana uğramış hissediyorsunuz?

Hiçbir Zaman	Çok Az Bir Zaman	Bazı Zamanlar	Çoğu Zaman	Her Zaman
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

BU SORULAR, YARALANMANIZ (SAKATLIĞINIZ) YA DA EKLEM RAHATSIZLIĞINIZA BAĞLI OLUŞAN PROBLEMLER NEDENİYLE BU HAFTA NE KADAR RAHATSIZ HİSSETTİĞİNİZ HAKKINDADIR

SİZİ NE KADAR RAHATSIZ EDİYOR.

35. Ellerinizi, kollarınızı veya bacaklarınızı kullanırken yaşadığınız problemler sizi ne kadar rahatsız ediyor?

Hiç Rahatsız Edici Değil	Az Rahatsız Edici	Orta Derecede Rahatsız Edici	Çok Rahatsız Edici	Aşırı Derecede Rahatsız Edici
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

36. Sırtınızı kullanırken yaşadığınız problemler sizi ne kadar rahatsız ediyor?

Hiç Rahatsız Edici Değil	Az Rahatsız Edici	Orta Derecede Rahatsız Edici	Çok Rahatsız Edici	Aşırı Derecede Rahatsız Edici
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

37. Evinizin etrafındaki işlerinizi yaparken yaşadığınız problemler sizi ne kadar rahatsız ediyor?

Hiç Rahatsız Edici Değil	Az Rahatsız Edici	Orta Derecede Rahatsız Edici	Çok Rahatsız Edici	Aşırı Derecede Rahatsız Edici
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

38. Banyo yapma, giyinme, süslenme ya da diğer kişisel bakımlarla ilgili problemler sizi ne kadar rahatsız ediyor?

Hiç Rahatsız Edici Değil	Az Rahatsız Edici	Orta Derecede Rahatsız Edici	Çok Rahatsız Edici	Aşırı Derecede Rahatsız Edici
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

39. Uyku ve dinlenme ile ilgili problemler sizi ne kadar rahatsız ediyor?

Hiç Rahatsız Edici Değil	Az Rahatsız Edici	Orta Derecede Rahatsız Edici	Çok Rahatsız Edici	Aşırı Derecede Rahatsız Edici
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

40. Boş zaman ya da eğlence aktiviteleri ile ilgili problemler sizi ne kadar rahatsız ediyor?

Hiç Rahatsız Edici Değil	Az Rahatsız Edici	Orta Derecede Rahatsız Edici	Çok Rahatsız Edici	Aşırı Derecede Rahatsız Edici
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

41. Arkadaşlarınız, aileniz ya da hayatınızdaki diğer önemli insanlarla ilgili problemler sizi ne kadar rahatsız ediyor?

Hiç Rahatsız Edici Değil	Az Rahatsız Edici	Orta Derecede Rahatsız Edici	Çok Rahatsız Edici	Aşırı Derecede Rahatsız Edici
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

42. Düşünme, konsantre olma ya da hatırlamayla ilgili problemler sizi ne kadar rahatsız ediyor?

Hiç Rahatsız Edici Değil	Az Rahatsız Edici	Orta Derecede Rahatsız Edici	Çok Rahatsız Edici	Aşırı Derecede Rahatsız Edici
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

43. Yaralanmanız (sakatlığınız) ya da eklem rahatsızlığınıza alışma veya onunla başa çıkma ile ilgili problemler sizi ne kadar rahatsız ediyor?

Hiç Rahatsız Edici Değil	Az Rahatsız Edici	Orta Derecede Rahatsız Edici	Çok Rahatsız Edici	Aşırı Derecede Rahatsız Edici
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

44. Her zamanki günlük işlerinizi yaparken yaşadığınız problemler sizi ne kadar rahatsız ediyor?

Hiç Rahatsız Edici Değil	Az Rahatsız Edici	Orta Derecede Rahatsız Edici	Çok Rahatsız Edici	Aşırı Derecede Rahatsız Edici
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

45. Başkalarına bağımlı hissetme ile ilgili problemler sizi ne kadar rahatsız ediyor?

Hiç Rahatsız Edici Değil	Az Rahatsız Edici	Orta Derecede Rahatsız Edici	Çok Rahatsız Edici	Aşırı Derecede Rahatsız Edici
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

46. Tutulma ve ağrı ile ilgili problemler sizi ne kadar rahatsız ediyor?

Hiç Rahatsız Edici Değil	Az Rahatsız Edici	Orta Derecede Rahatsız Edici	Çok Rahatsız Edici	Aşırı Derecede Rahatsız Edici
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

KATILIMINIZ İÇİN TEŞEKKÜR EDERİZ...



APPENDIX B

Factor loading values for the four-factor construct of the SMFA-TR. The values more than 0.4 were accepted as significant.

Item	Factor 1 (Upper extremity dysfunction)	Factor 2 (Mobility)	Factor 3 (Daily activities)	Factor 4 (Mental and emotional problems)
Difficulty in...				
1. Getting in or out of a low chair	0.06	0.74	0.48	0.11
2. Opening medicine bottles or jars	0.81	0.12	0.30	0.18
3. Shopping for groceries or other things	0.42	0.54	0.61	0.16
4. Climbing stairs	0.08	0.85	0.35	0.10
5. Making a tight fist	0.85	0.03	0.23	0.11
6. Getting in or out of the bathtub or shower	0.34	0.76	0.41	0.14
7. Getting comfortable to sleep	0.09	0.11	0.27	0.51
8. Bending or kneeling down	0.07	0.91	0.33	0.11
9. Using buttons, snaps, hooks, or zippers	0.93	0.11	0.32	0.19
10. Cutting own fingernails	0.88	0.22	0.29	0.02
11. Dressing oneself	0.52	0.49	0.58	0.10
12. Walking	0.16	0.86	0.23	0.11
13. Getting moving sitting or lying down	0.02	0.75	0.29	0.38
14. Going out by oneself	0.25	0.82	0.22	0.15
15. Driving	0.44	0.52	0.63	0.15
16. Cleaning oneself after going to the bathroom	0.39	0.24	0.62	0.09
17. Turning knobs or levers	0.82	-0.03	0.36	0.09
18. Writing or typing	0.79	0.04	0.19	0.21
19. Pivoting	0.13	0.81	0.24	0.11
20. Doing usual physical recreational activities	0.18	0.58	0.69	0.21
21. Doing usual leisure activities	0.44	0.46	0.60	0.33
22. Sexual activity	0.19	0.24	0.56	0.33
23. Doing light housework or yard work	0.41	0.40	0.61	0.21
24. Doing heavy housework or yard work	0.41	0.49	0.62	0.34
25. Doing usual work	0.44	0.41	0.58	0.41
Frequency of...				
26. Walking with a limp	-0.08	0.76	0.42	0.39
27. Avoiding using painful limb(s) or back	0.23	0.61	0.69	0.34
28. Leg locks or gives way	-0.08	0.71	0.42	0.21
29. Problems with concentration	0.04	0.03	0.29	0.88
30. Doing too much in one day affects what you do the next day	0.31	0.41	0.64	0.47
31. Acting irritable towards those around you	-0.03	0.16	0.14	0.72
32. Being tired	0.21	0.31	0.69	0.55
33. Feeling disabled	0.34	0.53	0.74	0.66
34. Feeling angry or frustrated because of injury	-0.04	0.19	0.44	0.67
Bothered by problems with...				
35. Using hands, arms, or legs	0.79	0.11	0.33	0.29
36. Using your back	0.11	0.32	0.61	0.44
37. Doing work around home	0.33	0.49	0.66	0.35
38. Bathing, dressing, toileting	0.44	0.45	0.53	0.18
39. Sleep and rest	0.11	0.07	0.57	0.52

(Continues)



APPENDIX B (Continued)

Item	Factor 1 (Upper extremity dysfunction)	Factor 2 (Mobility)	Factor 3 (Daily activities)	Factor 4 (Mental and emotional problems)
40. Leisure or recreational activities	0.19	0.51	0.71	0.29
41. Friends, family	0.09	0.17	0.22	0.58
42. Thinking, concentrating	0.04	0.01	0.11	0.66
43. Adjusting or coping with injury	0.29	0.39	0.52	0.71
44. Doing usual work	0.34	0.41	0.72	0.43
45. Feeling dependent on others	0.38	0.52	0.49	0.68
46. Stiffness and pain	0.10	0.53	0.67	0.37