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Research Article

Cross-cultural adaptation and validation of the Turkish version of the Toronto Extremity Salvage Score in patients with musculoskeletal tumors

Bahadır Ocaktan[1], Mehmet Ali Deveci[2], Aliekber Yapar[3], Mehmet Ali Tokgöz[4], Aykın Şimşek[2]

[1]*Department of Orthopedics and Traumatology, Hitit University, Erol Olçok Training and Research Hospital, Çorum, Turkey*
[2]*Department of Orthopedics and Traumatology, Koç University, School of Medicine, İstanbul, Turkey*
[3]*Department of Orthopedics and Traumatology, Dr.Abdurrahman Yurtaslan Ankara Oncology Training and Research Hospital, Ankara, Turkey*
[4]*Department of Orthopedics and Traumatology, Ankara Keçiören Training and Research Hospital, Ankara, Turkey*

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ORCID iDs of the authors:
B.O. 0000-0002-2487-7232;
M.A.D. 0000-0002-3670-3985;
A.Y. 0000-0003-2227-2173;
M.A.T. 0000-0002-4056-3743;
A.Ş. 0000-0002-4566-7189.

ABSTRACT

Objective: The aim of the study was to translate theToronto Extremity Salvage Score (TESS) into Turkish and perform across-cultural adaptation for patients with musculoskeletal tumors.

Methods: Thirty-six patients (20 male, 16 female; mean age = 36.6 ± 15.4 years) who were diagnosed with malignant bone and soft tissue sarcoma or benign aggressive bone tumors between the years 2007 and 2012 were included in the study. TESS was translated into Turkish and back translated to determine language validity. To test convergent validity, the Turkish versions of the Short Form-36 (SF-36), Western Ontario and McMaster Universities Arthritis Index (WOMAC), and Disabilities of the Arm, Shoulder and Hand (DASH) were used. SF-36 was used on all patients while WOMAC and DASH were used onpatients with lower extremity tumors and upper extremity tumors respectively. The tests were repeated 15 days later and the intraclass correlation coefficient (ICC) was used to determine test-retest reliability.

Results: The Turkish version of TESS was found to have a strong negative correlation with WOMAC (r = -0.702; $P < 0.001$) and DASH (r = -0.774; $P < 0.001$) as well as a strong negative correlation with ROMS (r = 0.601; $P < 0.001$). Turkish TESS also had a statistically significant correlation with SF-36–Physical functioning, SF-36–Role Physical, SF-36–Bodily Pain, and SF36–General Health at levels ranging from 0.326 to 0.669 (r values ranging from 0.326 to 0.669, $P < 0.001$). The internal consistency (Cronbach's α:0.96 for lower extremity and Cronbach's α:0.94 for upper extremity) and test-retest reliability of Turkish TESS were found to be excellent (ICC lower extremity: 0.96 [0.935-0.983]; $P < 0.001$ and ICC upper extremity: 0.99 [0.967-0.997]; $P < 001$). ICC values varied between 0.674 and 0.987 for each item of the scale for both extremities.

Conlusion: The Turkish version of TESS seems to be a valid and reliable patient-reported outcome measure to evaluate physical function after musculoskeletal tumor surgery in Turkish patients.

Level of Evidence: Level II, Diagnostic Study

Introduction

Treatment of limb sarcomas changes rapidly with increasing knowledge and developing technology. These diseases, which were previously thought to be treated only by amputation, can now be treated mostly with limb preservation.[1] However, the amount of destruction due to malignancy, the function level of the preserved limb, and the patients' quality of life afterwards all have significant importance when it comes to determine the overall outcome of treatment.[2-4] In addition, benign aggressive bone and soft tissue tumors may also cause massive anatomical destruction; wide resection and endoprosthetic or biological reconstruction methods (recycled tumor-bearing autografts with or without vascularized fibula autograft (VFA), VFA alone, bone transport methods using external fixators, massive bone allografts (MBA) combined with VFG, MBA alone or allograft-prosthesis composites) might be needed for the treatment of such tumors.[5,6]

The postoperative function of limb sarcomas and benign aggressive bone tumors can be affected by many factors such as age, tumor type, resection amount, surgical margins, adjuvant treatments, and reconstruction methods.[7-9] Rather than a routine approach performed to each patient, a customized treatment plan should be made according to the variables specific to the patient and the disease, by evaluating the current situation and expectations of the patients separately. To evaluate functional results, disease-specific patient-oriented scales have also been developed for sarcomas.[10]

The Toronto Extremity Salvage Score (TESS) is a disease-specific patient-reported questionnaire that was developed to evaluate the physical function of patients undergoing surgery for sarcomas in extremities.[11] The content of TESS was developed with questions that were answered by both patients and physicians, and functional problems that patients with limb sarcoma could face were questioned. TESS's

Corresponding Author:
Mehmet Ali Tokgöz
m.alitokgoz@gmail.com

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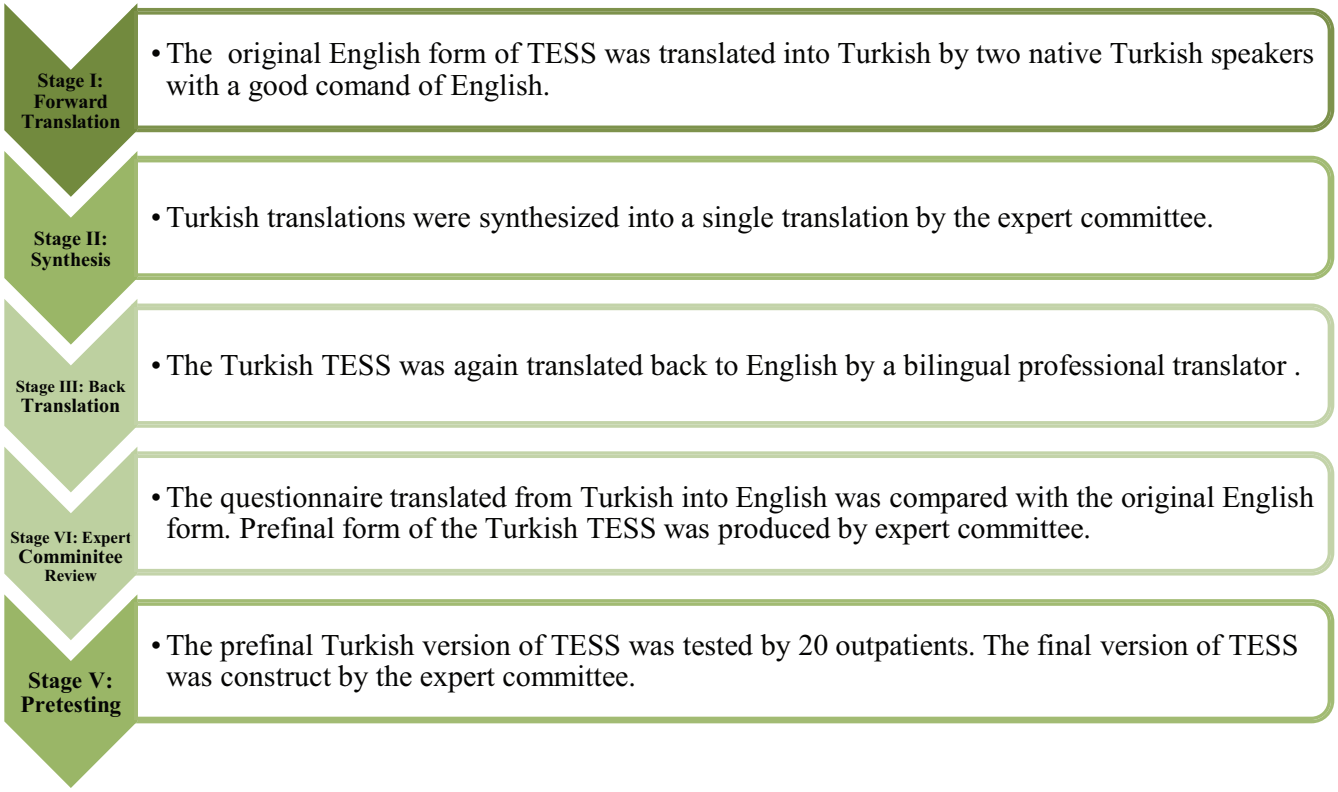


Figure 1. Flowchart depicting the processes used for the translation and cross-cultural adaptation.

inquiries include activities such as body movement, mobility, personal care, and daily and work activities.[12,13] TESS is performed both before and after treatment, and the effect of treatment on function can be determined. The scale has upper and lower extremity versions. TESS was developed in English; it is frequently used to evaluate the outcome after surgery for extremity sarcomas.[14–16]

However, in countries where English is not the native language, TESS should first be adapted according to cross-cultural differences.[17,18] In addition, standardized measures are needed for multicenter studies involving more than one country on sarcomas, which is a rare type of malignancy. TESS has been validated in Portuguese,[19] Dutch,[20] Danish,[21] Japanese,[22] Korean,[23] Italian[24] and Chinese[25] so far, but it has not yet been translated into Turkish. The aim of this study was to translate TESS into Turkish and perform the cross-cultural adaptation. In addition, the Turkish version of TESS was analyzed for reliability and validity in patients with limb sarcoma. The hypothesis of this study is that the cross-cultural adapted Turkish translation of TESS can be a valid and a reliable evaluation questionnaire for Turkish orthopedic oncology patient population.

HIGHLIGHTS

- The translated and culturally adapted Turkish version of TESS, a functional assessment with self-reported patient outcome scale, was found to be valid and reliable in malignant bone and soft tissue sarcoma and benign aggressive bone tumor for both lower and upper extremities.
- The Cronbach alpha of the Turkish TESS was calculated as 0.96 and excellent internal consistency was determined.
- The Turkish TESS can be used safely on the functional results of extremity sarcomas for evaluation of Turkish population.

Materials and Methods

Study design

The current methodologic study was conducted at Gazi University, School of Medicine, Department of Orthopedic Surgery and Traumatology, between 2007 and 2012. The records of the 'Bone and Soft Tissue Tumors Council' of our institute were retrospectively evaluated, and patient selection and data collection were performed according to the mentioned records. The patients meeting the following inclusion criteria were selected for the study: diagnosis of malignant bone and soft tissue sarcoma or benign aggressive bone tumor, age between 12 and 75 years, and at least 18 months of follow-up after the definitive treatment. All patients had received surgical interventions.

Patients with loss of exertion and function related to cardiovascular, respiratory, rheumatologic, and neurologic disorders were excluded from the study. Descriptive information of the patients such as age, sex, pathologic diagnosis, stage, location, and surgical treatment was retrospectively evaluated after extracting them from the council records and patient data files.

Written informed consent was obtained from each patient or the patient's parents or the patient's legal representative if the patient was underage. Ethical approval was obtained from Gazi University Medical Research and Ethics Committee (Date: 26.09.2012; No: 330). Permission was obtained from A. M. Davis, who is the original author

of TESS, for the validity, reliability, and cultural adaptation study of the Turkish translation via electronic correspondence. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Translation and cross-cultural adaptation and pretesting

In the language validity of Turkish TESS, expert translation and back-translation methods were performed using the translation procedure of Beaton et al.[17,18] In the first stage, the scale was translated from English to Turkish independently of each other by two translators, one of whom was a physician. The translated scale was evaluated by an expert committee consisting of public health, orthopedic, physiotherapy, and Turkish language experts, and necessary corrections were made. Finally, a common translation was produced. The prepared Turkish translation was translated back into English by two different translators who worked independently from each other (back-translation) and who were not involved in the first stage. The Turkish translation after the synthesis was evaluated by the expert committee and a trial form was prepared by comparing the Turkish translation and the back-translation (Figure 1).The trial form was performed on 20 patients selected from the outpatient clinic using the haphazard sampling method, which is one of the non-probability sampling methods. After fulfilling the trial scale form, the subjects were asked whether there was a question or option they did not understand due to language or cultural incompatibility and the answers given were noted. All feedbacks were discussed with the expert committee and the final form of the scale was formed without any changes (see the Appendix).

Patient-reported outcome (PRO) questionnaires

The Turkish version of TESS, the short form-36 (SF-36) for all patients, the Western Ontario and McMaster Universities Arthritis Index (WOMAC) for patients with lower extremity disease, and the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire for patients with upper extremity disease were used because there are no disease-specific Turkish questionnaires for patients with musculoskeletal cancer to be used in the validity analysis of TESS.

TESS includes 30 questions for the lower extremity and 29 questions for the upper extremity. The last two questions for both sections are generally related to how the patient feels (emotional acceptance and disability). Each question is rated on five-point scale of "impossible to do," "extremely difficult," "moderately difficult," "a little bit difficult," or "not at all difficult." There is an option to select "This task is not applicable for me", when the question is not a usual activity for the participant. The raw score is converted to a score ranging from 0 to 100 points, with higher scores indicating less functional limitations.[11]

The SF-36 is one of the most common generic scales used to measure health-related quality of life. The SF-36 consists of 36 items. It has eight subheadings: physical functioning (10 items), physical role functioning (4 items), bodily pain (2 items), and general health perceptions (5 items), as the physical component of SF-36; and social functioning (2 items), emotional role functioning (3 items), mental health (5 items), energy and vitality (4 items), as the mental component of SF-36. For each question, the scores are coded, summed and transformed on a scale from 0 (worst possible health state measured by the questionnaire) to 100 (best possible health state).[26]

The DASH questionnaire measures an individual's upper extremity abilities to complete tasks, absorb forces, social function, difficulties in sleeping, patient self-confidence and the severity of symptoms with 30-item (scored 1-5) self-reported scale. At least 27 of the 30 items must be completed for a score to be calculated. The assigned values for all completed responses are simply summed and averaged, producing a score out of five. This value is then transformed to a score out of 100 by subtracting one and multiplying by 25. This transformation is performed to make the score easier to compare with other measures scaled on a 0-100 scale. A higher score indicates greater disability.[27]

The WOMAC scale is a set of questionnaires used to assess the condition of patients with knee and hip osteoarthritis.[28]In this study, the use of WOMAC was deemed appropriate because it interrogated areas similar to the lower extremity section of TESS. WOMAC consists of 24 questions in three parts, measuring five items for pain (score range 0-20), two for stiffness (score range 0-8), and 17 for functional limitation (score range 0-68). The total score ranges from 0 to 96. Higher scores indicate severe symptoms, maximal limitations and poor quality of life.[29]

Final testing

The Turkish version of TESS (TESS1), a kind of PRO scale, was completed by patients under the supervision of senior orthopedics assistants. During the15-day period, no treatment was given so that the patient's examination findings did not change, and Turkish TESS (TESS2) was completed again for the retest.The SF-36 quality of life scale was given to all patients simultaneously, WOMAC was given to patients with lower extremity disease, and the DASH questionnaire was administered to patients with upper extremity disease. In addition, the range of motion of the limbs of all patients was recorded. All PRO questionnaires and physical examination records were noted by the same health professionals to eliminate practitioner-dependent differences. Healthcare professionals and legal representatives helped patients aged under 18 years in the completion of the questionnaires.

Reliability

Scale reliability was evaluated by calculating the test–retest reliability and internal consistency. For the test–retest reliability, the test was performed on the same individuals for the second time with a 15-day interval. To evaluate the test–retest reliability, the score difference between the test and retest was evaluated using the Wilcoxon test. Intraclass Correlation Coefficients (ICC) were used to evaluate the consistency of scale scores in both the test and retest. ICC values could range from 0.00 to 1.00. Values between 0.60 and 0.80 are proof of good reliability, and values over 0.80 indicate excellent reliability.[30] The Alpha coefficient (Cronbach's alpha) was used to evaluate internal consistency. Alpha coefficients between 0.80 and 1.00 are proof of high reliability.[31]

Validity

Convergent validity

Convergent validity is supporting evidence for construct vali dity.[32]Turkish versions of the WOMAC, DASH, and SF-36 scales were used to test convergent validity. Convergent validity was evaluated using correlation coefficients between TESS and other scale measurements (the physical component of SF-36, DASH, and WOMAC). Construct validity was tested by evaluating the relationship between the TESS scores and joint Range of Motion Scale (ROMS) measurements using the Spearman correlation coefficient. ROMS measurements were made using neutral zero methods with a goniometer.[33] The angle measured was proportioned to the normal maximum angle of the joint and classified as 5: 100%, 4: 75%-99%, 3: 50%-74% 2: 25%-49%, 1: 0%-24%, 0: no movement. In construct validity, scores of similar measurements are expected to be statistically significantly related to each other.[34]

Discriminant validity

Discriminant validity is considered as a subcategory of construct validity.[35] In discriminant validity, the ability of the scale to distinguish the groups of different structures and characters is tested. The patients were re-grouped according to age (under/over 35 years), sex, and marital status, and Turkish TESS scores were compared between the groups. Turkish TESS score was compared in some groups to test the discriminant validity of the questionnaires.

Statistical analysis

The Statistical Package for the Social Sciences (SPSS) for Windows 15.0 statistics program was used for statistical analysis (SPSS Inc.; Chicago, IL, USA), and $P < 0.05$ was used for the significance level. Continuous variables are presented as mean ± standard deviation, and categorical variables as number and percentage. Normal distribution for continuous variables was assessed using visual (histograms and probability graphics) and analytical methods (the Kolmogorov–Smirnov and Shapiro–Wilk tests). The continuous variables were not normally distributed. For continuous variables without normal distribution, the difference between two independent groups such as age (over 35 years vs under 35 years), sex, and marital status (married vs single) was evaluated using the Mann–Whitney *U*-test. The Wilcoxon test was used to compare the scale scores of the same group in the test and retests. Chi-square tests were used to compare categorical variables between groups. The relationship between numerical variables was examined using Spearman correlation test.

The sample size of this study was calculated using the G*Power 3.1 program. A minimum of 26 patients was planned to be included in the study according to the sample size calculation by adjusting the effect size as 0.5, power as 80%, and alpha error as 0.05.

Results

Participants and score distribution

A total of 66 patients who met the criteria within the specified date range were identified, but only 36 patients agreed to participate in the study. The posthoc power of this study, which was completed by reaching 36 patients between 2007 and 2012, was calculated as 0.919. The mean age of the 36 patients was 36.6 ± 15.4 years, and the mean follow-up time was 30.4 ± 7.5 months. When the histopathologic diagnoses of the patients were examined, bone sarcoma was present in 24 (66.5%) patients, soft tissue sarcoma in eight (22.2%), and benign aggressive bone tumor in four (11.1%) (Table 1). Fifty-six percent of the patients were male (20 patients). Thirteen patients answered the TESS for the lower extremity, stating that items "Heavy household chores such as vacuuming and moving furniture (*n*: 8, 34%)," "Working my usual number of hours (*n*: 7, 30%)," and "Driving (*n*: 7s, 30%)" did not apply to them. Twenty-three patients answered the TESS for the upper extremity, stating that items "Working my usual number of hours (*n* = 6, 46%)," "Gardening or yard work (*n* = 5, 38%)," and "Performing heavy household chores (*n* = 5, 38%)" did not apply to them.

The mean first test Turkish TESS scores of the patients were found as 78.81 ± 15.77% for lower extremity and 74.64 ± 13.19% for the upper extremity (Table 2). "Lifting a box to an overhead shelf" (3.34 ± 0.2) and "Turning a key in a lock" (3.47 ± 0.71) for Turkish TESS upper extremity scale, and "Walking up or down hills or a ramp" (3.31 ± 1.14), "kneeling" (3.40 ± 0.83), and "Gardening and yard work" (3.48 ± 0.95) for Turkish TESS lower extremity scale were observed to have the lowest scores.

Table 1. Baseline Characteristics of the Patients

Characteristics	Patients (*n* = 36)
Age (year)	
Mean	36.6 ± 15.4
Gender, *n* (%)	
Male	20 (56)
Female	16 (44)
Histological type, *n* (%)	
Bone Sarcoma	
Osteosarcoma	6 (16)
Chondrosarcoma	14 (40)
Ewing sarcoma	4 (11)
Soft Tissue Sarcoma	
Rhabdomyosarcoma	2 (6)
Undifferentiated pleomorphic sarcoma	2 (6)
Synovial sarcoma	1 (3)
Fibrosarcoma	2 (6)
Angiosarcoma	1 (3)
Benign aggressive bone tumor	
Giant cell tumor of bone	3 (8)
Chondroblastoma	1 (3)
Follow-up period (month)	30.4 ± 7.5
Type of surgery	
Endoprosthetic reconstruction	23 (64)
Wide resection	9 (25)
Curettage with grafting	1 (3)
Biological reconstruction	3 (8)
Tumor location (%)	
Shoulder girdle	9 (25)
Knee	8 (22)
Femur	7 (20)
Forearm and elbow	4 (11)
Hip and pelvis	8 (22)
Surgical stage system	
1A	1 (3)
1B	4 (11)
2A	17 (46)
2B	14 (40)
3	0

Reliability

Internal consistency (Cronbach's α: 0.96 for lower extremity and Cronbach's α: 0.94 for upper extremity) and test–retest reliability of Turkish TESS were found to be excellent ($ICC_{lower\ extremity}$: 0.96 (0.935-0.983; $P < 001$ and $ICC_{upper\ extremity}$: 0.99 (0.967-0.997; $P < 001$). It was observed that there was no significant difference between the total scores in the test-retest ($P_{lower\ extremity} = 0.260$ and $P_{upper\ extremity} = 0.49$) (Table 2). ICC values varied between 0.674 and 0.987 for each item of the scale for both extremity. (Tables 3 and 4). It was observed that the reliability of the scale was high.

Validity

Construct validity–convergent validity: Turkish TESS had a strong negative correlation with WOMAC ($r = -0.702$; $P < 0.001$), DASH ($r = -0.774$; $P < 0.001$) and a strong correlation with ROMS ($r = 0.601$; $P < 0.001$). Turkish TESS also had a statistically significant correlation with SF-36—physical functioning, SF-36—role

Table 2. Test–Retest Data for the Total Score of the TESS and Results of Reliability Analysis

TESS	Mean score (%)	Standard deviation	Range	*P**	ICC**	Cronbach's α
Lower extremity				0.260	0.960 (0.935-0.983; $P < 0.001$)	0.96
TESS1 (Test)	78.81	15.77	30-100			
TESS2 (Retest)	76.66	15.47	35-100			
Upper extremity				0.491	0.990 (0.967-0.997; $P < 0.001$)	0.94
TESS1 (Test)	74.64	13.19	37-93			
TESS2 (Retest)	74.11	15.56	29-98			

*Wilcoxon test.
**ICC: Intraclass Correlation Coefficients (95% Confidence Interval; *P*).

Table 3. Test–Retest Reliability for the Items Scores of the TESS in the Lower Extremity

TESS items	Question	ICC**
Item 1	Putting on a pair of pants	0.819 (0.673-0.0.903; $P < 0.001$)
Item 2	Putting on shoes	0.886 (0.788-0.940; $P < 0.001$)
Item 3	Putting on socks or stockings	0.812 (0.632-0.904; $P < 0.001$)
Item 4	Showering	0.762 (0.582-0.871; $P < 0.001$)
Item 5	Light household chores such as tidying and dusting	0.793 (0.630-0.889; $P < 0.001$)
Item 6	Gardening and yard work	0.832 (0.670-0.914; $P < 0.001$)
Item 7	Preparing and serving meals	0.892 (0.789-0.945; $P < 0.001$)
Item 8	Going shopping	0.928 (0.858-0.963; $P < 0.001$)
Item 9	Heavy household chores such as vacuuming and moving furniture	0.882 (0.781-0.932; $P < 0.001$)
Item 10	Getting in and out of the bath tub	0.829 (0.665-0.913; $P < 0.001$)
Item 11	Getting out of bed	0.928 (0.864-0.960; $P < 0.001$)
Item 12	Rising from a chair	0.866 (0.737-0.932; $P < 0.001$)
Item 13	Kneeling	0.876 (0.756-0.937; $P < 0.001$)
Item 14	Bending to pick something up off the floor	0.911 (0.826-0.955; $P < 0.001$)
Item 15	Walking upstairs	0.893(0.790-0.946; $P < 0.001$)
Item 16	Walking downstairs	0.877(0.755-0.936; $P < 0.001$)
Item 17	Driving	0.913(0.823-0.956; $P < 0.001$)
Item 18	Walking within the house	0.878(0.761-0.938; $P < 0.001$)
Item 19	Walking outdoors	0.925(0.854-0.962; $P < 0.001$)
Item 20	Sitting	0.861(0.728-0.929; $P < 0.001$)
Item 21	Walking up or down hills or a ramp	0.969 (0.939-0.984; $P < 0.001$)
Item 22	Standing upright	0.938 (0.878-0.968; $P < 0.001$)
Item 23	Getting up from kneeling	0.940 (0.882-0.969; $P < 0.001$)
Item 24	Getting in and out of a car	0.949 (0.903-0.974; $P < 0.001$)
Item 25	Participating in sexual activities	0.905 (0.813-0.951; $P < 0.001$)
Item 26	Completing my usual duties at work	0.890 (0.794-0.942; $P < 0.001$)
Item 27	Working my usual number of hours	0.913 (0.830-0.956; $P < 0.001$)
Item 28	Participating in my usual leisure activities	0.898 (0.810-0.947; $P < 0.001$)
Item 29	Socializing with friends and family	0.927 (0.861-0.967; $P < 0.001$)
Item 30	Participating in my usual sporting activities	0.920 (0.821-0.965; $P < 0.001$)

*Wilcoxon test.
**ICC: Intraclass Correlation Coefficients (95% Confidence Interval; *P*).

Table 4. Test–Retest Reliability for the Items Scores of the TESS in the Upper Extremity

TESS items	Question	ICC**
Item 1	Putting on a pair of pants	0.981 (0.938-0.0.994; $P < 0.001$)
Item 2	Tying shoe laces	0.929 (0.767-0.978; $P < 0.001$)
Item 3	Putting on socks or stockings	0.954 (0.849-0.986; $P < 0.001$)
Item 4	Showering	0.944 (0.817-0.983; $P < 0.001$)
Item 5	Dressing my arms and upper body	0.974 (0.916-0.992; $P < 0.001$)
Item 6	Buttoning a shirt	0.985 (0.950-0.995; $P < 0.001$)
Item 7	Tying a tie or a bow at the neck of a blouse	0.964 (0.881-0.989; $P < 0.001$)
Item 8	Putting on make-up or shaving	0.977 (0.926-0.993; $P < 0.001$)
Item 9	Brushing your teeth	0.984 (0.947-0.995; $P < 0.001$)
Item 10	Brushing your hair	0.880 (0.607-0.963; $P < 0.001$)
Item 11	Doing light household chores	0.979 (0.931-0.994; $P < 0.001$)
Item 12	Gardening or yard work	0.920 (0.598-0.984; $P < 0.001$)
Item 13	Preparing and serving meals	0.797 (0.335-0.938; $P < 0.001$)
Item 14	Cutting food while eating	0.923 (0.748-0.977; $P < 0.001$)
Item 15	Drinking from a glass	0.963 (0.879-0.989; $P < 0.001$)
Item 16	Performing heavy household chores	0.674 (0.630-0.935; $P < 0.001$)
Item 17	Going shopping	0.922 (0.746-0.976; $P < 0.001$)
Item 18	Giving or receiving change (ie, coins or bills)	0.917 (0.728-0.975; $P < 0.001$)
Item 19	Carrying a shopping bag or briefcase	0.984 (0.947-0.995; $P < 0.001$)
Item 20	Lifting a box to an overhead shelf	0.931 (0.774-0.979; $P < 0.001$)
Item 21	Turning a key in a lock	0.987 (0.959-0.996; $P < 0.001$)
Item 22	Pushing or pulling open a door	0.956 (0.855-0.986; $P < 0.001$)
Item 23	Writing	0.869 (0.571-0.960; $P < 0.001$)
Item 24	Picking up small items	0.979 (0.933-0.994; $P < 0.001$)
Item 25	Completing my usual duties at work	0.814 (0.352-0.946; $P < 0.001$)
Item 26	Working my usual number of hours	0.824 (0.270-0.970; $P < 0.001$)
Item 27	Participating in my usual leisure activities	0.978 (0.929-0.993; $P < 0.001$)
Item 28	Socializing with friends and family	0.984 (0.949-0.995; $P < 0.001$)
Item 29	Participating in my usual sporting activities	0.976 (0.923-0.993; $P < 0.001$)

*Wilcoxon test.
**ICC: Intraclass Correlation Coefficients (95% Confidence Interval; *P*).

Table 5. Results of Validity Analysis: Correlations of TESS with WOMAC, DASH, and ROMS

	TESS	
	r	*P*
WOMAC	−0.702	< 0.001
DASH	−0.774	0.007
ROMS	0.601	< 0.001
SF-36 (PF)	0.672	< 0.001
SF-36 (RP)	0.669	< 0.001
SF-36 (BP)	0.326	< 0.001
SF-36 (GH)	0.402	< 0.001

Abbrevitations: *r*, Spearman Correlations Coefficient; ROMS, Range of Motion Scale; PF, Physical Functioning; RP, Role Physical; BP, Bodily Pain; GH: General Health.

physical, SF-36—bodily pain, and SF-36—general health at levels ranging from 0.326 to 0.669 (*r* values ranging from 0.326 to 0.669, $P < 0.001$) (Table 5).

Discriminant validity: Turkish TESS score showed a significant difference in terms of age groups ($P = 0.046$), which meant that the scale had the power to distinguish different patient groups; however, the

TESS scores were similar between the sex (P = 0.736) and marital status (P = 0.198) groups.

Discussion

In this study, the translated and culturally adapted Turkish version of TESS, a functional assessment with a self-reported patient outcome scale, was found to be valid and reliable in extremity sarcomas for both the lower and upper extremities. The Cronbach's α was calculated as 0.96 for lower extremity (ICC: 0.96) and 0.94 for upper extremity (ICC: 0.99). There was no statistically significant difference between the test and retest, and Turkish TESS was considered to have sufficient reliability both upper and lower extremity. The ICC values of upper and lower extremity, which were high and close to each other overall and for each question of the scale, were evaluated as sufficient when compared with studies in the literature.[19,24]

The Musculoskeletal Tumor Society (MSTS) scoring system, which was also used in the original study of TESS,[11] the Quality of Life Questionnaire Core 30 of European Organization for Research and Treatment of Cancer (EORTC QLQ-C30), and SF-36 are the most commonly used PRO scales during validation of TESS in other languages. However, the Turkish validity and reliability studies of the MSTS and EORTC QLQ-C30 had not been conducted at the time of the study.[23–25] To evaluate the validity of Turkish TESS, in addition to the SF-36, DASH for patients with upper extremity disease and WOMAC scores for patients with lower extremity disease were performed, and it was shown to be valid through strong correlations between Turkish TESS and reference scores. It is important that TESS is valid and reliable in different languages such that the functional results of patients could be evaluated. The validity and reliability of TESS in the original version and other languages will increase international cooperation and facilitate the determination of treatment strategies for low-frequency limb sarcomas.

In the study conducted by Davis et al.,[11] the tasks reported as non-applicable to patients for the lower extremity were determined as "Gardening and yard work," "Participating in sexual activities," "Driving" and "Working my usual number of hours." In this study, the tasks that the patients said did not apply the lower extremity were determined as "Heavy household chores such as vacuuming and moving furniture," "Working my usual number of hours" and "Driving." The reason for the difference between the results was that the high number of male patients in this study and old-fashioned attitude of male patients about sharing responsibilities related to cleaning activities. Also, the low rate of returning to active working life after surgery and the patients' avoiding open self-expression on sexual topics due to the cultural background could be other reasons for the differences mentioned. In this study, the tasks that were not applicable to the patients for the upper extremity were determined as "Working my usual number of hours," "Gardening or yard work" and "Performing heavy household chores." These results were in line with the studies of Davis and other researchers.[11,22,23,25]

The strength of the study was that tools for general quality of life were also used to verify Turkish TESS. Our results suggest that high ICC and Cronbach alpha values were determined, and strong internal consistency, reliability, and construct validity were provided with these values. Several limitations were present for this current study. First, the limited number of patients from a single center and their oncologic distribution characteristics (tumor type, surgery type, local recurrence, metastasis and disease progression) could have affected the results. Second, the evaluation was not made in terms of inter-observer reliability. Another limitation of the study was that there is no scale for the functional evaluation of patients with extremity tumors in Turkish with which we could evaluate the convergent validity of TESS. In such cases, different valid and reliable scales with fields similar to TESS could be used for convergent validity. Also, to avoid misleading results, ceiling and floor effects could not be assessed because the sample size was less than 50. Besides, time-based evaluations (0-3-6-12-24-36 months) and comparisons of the Turkish version of TESS were not made due to validation study design; however, it is well known that time contributes to the healing process of musculoskeletal disorders. The 15-day interval between the test and retest and the absence of repeated applications of Turkish TESS might have affected the results.

In conclusion, Turkish TESS is a reliable and valid patient-reported outcome measure of physical function after musculoskeletal tumor surgery. This study revealed that Turkish TESS can be used safely in the evaluation of the functional outcomes of Turkish orthopedic oncology patient population for the forthcoming studies regarding orthopedic oncology conditions.

Ethics Committee Approval: Ethics committee approval was received for this study from the Local Ethics Committee of Gazi University, School of Medicine (26.09.2012; No: 330).

Informed Consent: Written informed consent was obtained from the patients who participated in this study.

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Appendix: Turkish version of Toronto Extremity Salvage Score (TESS)

Toronto Ekstremite Kurtarma Puanı (TESS)

(Davis 1996)

Üst Ekstremite Anketi

Alt Ekstremite Anketi

Not: Yalnızca üst veya alt ekstremite formu doldurulur, ikisi birden değil

TESS - Üst Ekstremite Anketi

Hastanın Çalışma Numarası: Hasta İsmi Baş Harfleri (İlk/Orta/Son):

Doğum Tarihi: Form Dolduma Tarihi:

Cerrahi sonrası geçen süre: □Cerrahi öncesi dönem □ 3 ay □ 6 ay □ 12 ay □ 24 ay □ 36 ay

Bölge: □ Kemik □ Yumuşak Doku

Cerrahi Taraf: □ Sağ □ Sol

Hangi elinizi kullanıyorsunuz? □ Sağ □ Sol

Aşağıdaki sorular günlük hayatta sıklıkla gerçekleştirilen aktiviteler hakkındadır. Her soru, her bir öğeyi **geçen hafta** o görevi gerçekleştirme becerinizi en iyi tanımlayan açıklamanın karşısına işaretlemenizi ister (aşağıdaki örneklerde olduğu gibi). Bazı aktiviteleri yapmak sizin için son derece kolay olacak, bazılarını çok zor veya imkansız olacaktır.

ÖRNEK:

Sebzeleri soymak:

1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

Aktivite **normalde günlük aktivitelerinizde yaptığınız bir şeyse**, ancak güçsüzlük, sertlik veya ağrı gibi fiziksel kısıtlamalar nedeniyle **artık yapamıyorsanız**, "Yapması imkansız" cevabını seçmelisiniz. Normal yaşam tarzınızın bir parçası olarak bir aktivite gerçekleştirmezseniz, maddenin geçerli olmadığını belirtmek için "888" yanıtını seçersiniz. **Geçen hafta** yeteneklerinizi en doğru şekilde tanımlayan açıklamayı seçtiğinizden emin olarak tüm öğeleri işaretleyin.

Aşağıdaki sorular, günlük yaşamda ortak olan etkinlikleri gerçekleştirme beceriniz hakkında sorular sormaktadır. Kolunuzla yaşadığınız mevcut sorun nedeniyle faaliyeti gerçekleştirmekte yaşadığınız zorluk miktarını göz önünde bulundurarak, lütfen **geçen hafta** etkinliği yapma yeteneğinizi en iyi tanımlayan yanıtı seçerek soruları yanıtlayın.

1- Pantolon giymek:

1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

2- Ayakkabı bağlamak:

1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

3- Çorap giymek:

1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

4- Duş almak:

1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

5- Üst elbise giymek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

6- Düğme iliklemek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

7- Kravat veya fiyonk bağlamak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

8- Makyaj yapmak veya tıraş olmak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

9- Diş fırçalamak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

10- Saç taramak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

11- Hafif ev işleri:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

12- Bahçe, avlu işi:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

13- Yemek hazırlamak ve servis etmek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

14- Yemekte bıçak kullanmak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

15- Bardaktan su içmek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

16- Ağır ev işleri:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

17- Alışverişe gitmek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

18- Para vermek veya almak (Örn: Kağıt veya demir para)
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

19- Çanta taşımak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

20- Bir kutuyu başüstü rafa koymak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

21- Kilitteki anahtarı çevirmek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

22- Kapıyı çekmek veya itmek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

23- Yazı yazmak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

24- Küçük nesneleri almak: 1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

25- İşte günlük rutin görevleri yapmak (İş, ev dışında veya ev de yapılan işleri de içerir.):
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

26- Çalışma saatini doldurmak: (İş, ev dışında veya ev de yapılan işleri de içerir.):
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

27- Her zamanki boş zaman aktivitelerime katılmak
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil

28- Aile ve arkadaşlarla zaman geçirmek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil

29- Her zamanki spor aktivitelerime katılmak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil

30- Günlük yaşamda katıldığım tüm aktiviteler göz önüne alındığında, geçen hafta boyunca bu etkinlikleri gerçekleştirme yeteneğimi şu şekilde değerlendiririm:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.

31- Kendim hakkında genel değerlendirmem şöyle:
1____ Tamamen engelli.
2____ Ciddi şekilde engelli.
3____ Orta derecede engelli.
4____ Hafif engelli.
5____ Engelli değil.

Lütfen aşağıda, gerçekleştirmekte zorlandığınız herhangi bir etkinlik veya şu anda önemli olduğunu düşündüğünüz ve bu ankette sorulmayan bir sorun nedeniyle karşılaştığınız diğer zorluklar hakkında yorum yapınız.

.....

.....

Herhangi bir soruyu kaçırmadığınızdan emin olmak için lütfen kontrol edin.

Bu soruları cevaplamak için zaman ayırdığınız için teşekkür ederiz.

TESS - Alt Ekstremite Anketi

Hastanın Çalışma Numarası: Hasta İsmi Baş Harfleri (İlk/Orta/Son):

Doğum Tarihi: Form Dolduma Tarihi:

Cerrahi sonrası geçen süre: □Cerrahi öncesi dönem □ 3 ay □ 6 ay □ 12 ay □ 24 ay □ 36 ay

Bölge: □ Kemik □ Yumuşak Doku

Cerrahi Taraf: □ Sağ □ Sol

Hangi elinizi kullanıyorsunuz? □ Sağ □ Sol

Aşağıdaki sorular günlük hayatta sıklıkla gerçekleştirilen aktiviteler hakkındadır. Her soru, her bir öğeyi **geçen hafta** o görevi gerçekleştirme becerinizi en iyi tanımlayan açıklamanın karşısına işaretlemenizi ister (aşağıdaki örneklerde olduğu gibi). Bazı aktiviteleri yapmak sizin için son derece kolay olacak, bazılarını çok zor veya imkansız olacaktır.

ÖRNEK:

Bisiklet sürmek:

1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

Aktivite **normalde günlük aktivitelerinizde yaptığınız bir şeyse**, ancak güçsüzlük, sertlik veya ağrı gibi fiziksel kısıtlamalar nedeniyle **artık yapamıyorsanız**, "Yapması imkansız" cevabını seçmelisiniz. Normal yaşam tarzınızın bir parçası olarak bir aktivite gerçekleştirmezseniz, maddenin geçerli olmadığını belirtmek için "888" yanıtını seçersiniz. **Geçen hafta** yeteneklerinizi en doğru şekilde tanımlayan açıklamayı seçtiğinizden emin olarak tüm öğeleri işaretleyin.

Aşağıdaki sorular, günlük yaşamda ortak olan etkinlikleri gerçekleştirme beceriniz hakkında sorular sormaktadır. Kolunuzla yaşadığınız mevcut sorun nedeniyle faaliyeti gerçekleştirmekte yaşadığınız zorluk miktarını göz önünde bulundurarak, lütfen **geçen hafta** etkinliği yapma yeteneğinizi en iyi tanımlayan yanıtı seçerek soruları yanıtlayın.

1- Pantolon giymek:

1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

2- Ayakkabı bağlamak:

1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

3- Çorap giymek:

1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

4- Duş almak:

1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

5- Evi toparlamak ve toz almak gibi hafif ev işleri yapmak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

6- Bahçe, avlu işi:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

7- Yemek hazırlamak ve servis etmek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

8- Alışverişe gitmek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

9- Süpürge yapma ve mobilya taşıma gibi ağır ev işleri:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

10- Banyo küvetine girip çıkmak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

11- Yataktan kalkmak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

12- Sandalyeden kalkmak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

13- Diz çökmek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

14- Eğilerek yerden nesne almak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

15- Merdiven çıkmak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

16- Merdiven inmek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

17- Araba kullanmak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

18- Ev içinde yürümek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

19- Dışarıda yürümek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

20- Oturmak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

21- Tepeden veya rampadan yukarı veya aşağı yürümek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

22- Ayakta dik durmak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

23- Diz çökülü halden ayağa kalkmak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

24- Arabaya inip binmek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

25- Cinsel ilişkiye girmek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

26- İşte günlük rutin görevleri yapmak (İş, ev dışında veya ev de yapılan işleri de içerir.):
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

27- Çalışma saatini doldurmak: (İş, ev dışında veya ev de yapılan işleri de içerir.):
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil.

28- Her zamanki boş zaman aktivitelerime katılmak
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil

29- Aile ve arkadaşlarla zaman geçirmek:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil

30- Her zamanki spor aktivitelerime katılmak:
1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.
888____ Bu görev benim için geçerli değil

31- Günlük yaşamda katıldığım tüm aktiviteler göz önüne alındığında, geçen hafta boyunca bu etkinlikleri gerçekleştirme yeteneğimi şu şekilde değerlendiririm:

1____ Yapması imkansız.
2____ Son derece zor.
3____ Orta derecede zor.
4____ Biraz zor.
5____ Hiç zor değil.

32- Kendim hakkında genel değerlendirmem şöyle:

1____ Tamamen engelli.
2____ Ciddi şekilde engelli.
3____ Orta derecede engelli.
4____ Hafif engelli.
5____ Engelli değil.

Lütfen aşağıda, gerçekleştirmekte zorlandığınız herhangi bir etkinlik veya şu anda önemli olduğunu düşündüğünüz ve bu ankette sorulmayan bir sorun nedeniyle karşılaştığınız diğer zorluklar hakkında yorum yapınız.

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Herhangi bir soruyu kaçırmadığınızdan emin olmak için lütfen kontrol edin.
Bu soruları cevaplamak için zaman ayırdığınız için teşekkür ederiz.