The validity and reliability studies of the University of California, Los Angeles Scleroderma Clinical Trial Consortium Gastrointestinal Tract (UCLA SCTC GIT) 2.0 questionnaire for the Turkish society

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ABSTRACT

Background/Aims: To translate the University of California, Los Angeles Scleroderma Clinical Trial Consortium Gastrointestinal Tract (UCLA SCTC GIT) 2.0 questionnaire from English to Turkish and to validate it.

Materials and Methods: UCLA SCTC GIT 2.0 was translated into Turkish using the translation-retranslation method. The available Turkish GIT 2.0 and the Short Form 36 (SF-36) were administered to 97 Turkish-speaking patients with systemic sclerosis (Ssc). Internal consistency reliability and structural validity were assessed by analyzing the correlations between the UCLA SCTC GIT 2.0 and the SF-36 scales. Internal consistency was determined by calculating Cronbach's alpha. For evaluation of reliability, the questionnaire scale was repeatedly applied to a subgroup of patients with a 2-week interval, and the intraclass correlation coefficient (ICC) was calculated. The Spearman's correlation coefficients between the GIT and the SF-36 scores were calculated.

Results: A group of 97 patients with Ssc with a mean age of 55.37±11.35 years and a female predominance (87.6%) were included in the study. The Cronbach's alpha value for the UCLA SCTC GIT 2.0 scale was 0.894. ICC was 0.821 (p=0.000). The scale showed acceptable reliability, with the exception of the diarrhea subscale (alpha=0.356). There was a moderate correlation between the total GIT score and the Short Form 36 (SF-36) subscales. All of the items in the scale were included in the validity analysis owing to their reliability.

Conclusion: The Turkish GIT 2.0 scale showed good internal consistency, high reliability, and an acceptable validity.

Keywords: Scleroderma, gastrointestinal system, validity, reliability, UCLA

INTRODUCTION

Systemic sclerosis (Ssc) is a systemic autoimmune disorder of unknown etiology characterized by fibrosis of the skin and internal organs (1). Its most distinctive manifestation is thickening of the skin, but fibrotic and vascular changes can also occur in the gastrointestinal system (GIS) and internal organs (2). Approximately 90% of patients with Ssc develop GIS symptoms (2-4).

The GIS is the most common site of internal organ involvement in Ssc, which is characterized by progressive multiorgan vasculopathy and fibrosis (5). Although the pathogenesis of Ssc is not fully understood, vasculopathy is thought to disrupt intestinal permeability. Neural dysfunction, fibrosis, and finally, loss of function are added to this picture (6). Independent of etiology, progressive vasculopathy and fibrosis can cause irritating symptoms, such as esophageal reflux, flatulence, distension, constipation, diarrhea, and fecal incontinence. Therefore, evaluations of GIS symptoms and responses to therapy require patients' responses to the questionnaire (7).

The University of California, Los Angeles Scleroderma Clinical Trial Consortium Gastrointestinal Tract (UCLA SCTC GIT) 1.0 questionnaire was developed by Khanna et al. (2) to evaluate the severity of quality of life impacts and

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Table 1. Clinical features of field testing patients with Ssc.

Patient (n: 10)	
Age (years), mean (SD)	57.5 (±7.6)
Female, n (%)	8 (80%)
Type of SSc, n (%)	
Diffuse	3 (30%)
Limited	7 (70%)
Overlap	0 (0%)
Disease duration (years), mean (SD)	7.9 (±4.7)
Education duration (years), mean (SD)	9.1 (±5.7)
Autoantibodies positive, n (%)	
Antinuclear antibody	10 (100%)
Anti-centromere antibody	5 (50%)
Anti-topoisomerase-1 antibody	3 (30%)
Anti-SSA	1 (10%)
Anti-SSB	1 (10%)
Modified Rodnan skin score, mean (SD)	8.5 (max: 26, min: 0, SD: ±8.2)
C-reactive protein (mg/l), mean (SD)	6.6 (max: 18, min: 1, SD: ±4.7)
Medications, n (%)	
Ongoing PPI, n (%)	9 (90%)
Ongoing prokinetics, n (%)	1 (10%)
Low dose corticosteroids (<7.5 mg/day), n (%)	5 (50%)
Calcium channel blockers, n (%)	7 (70%)
Chronic antibiotic therapy, n (%)	0 (0%)
Laxatives, n (%)	0 (0%)
Antidiarrheal agents, n (%)	0 (0%)
Antidepressants, n (%)	2 (20%)
Hydroxychloroquine, n (%)	4 (40%)
Immunosuppressants, n (%)	5 (50%)
Azathioprine	4 (40%)
Methotrexate	1 (10%)
Cyclosporine	0 (0%)
Interferon	0 (0%)
Rituximab	0 (0%)
Forced vital capacity % predicted, mean (SD)	84 (min: 53, max: 118, SD: ±22)
Diffusion capacity (DLCO) % predicted, mean (SD)	63.4 (min: 36, max: 80, SD: ±15.6)
Pulmonary involvement, n (%)	4 (40%)

Ssc: systemic sclerosis.

GIS symptoms in patients with Ssc. It was revised in 2009 and is currently known as the UCLA SCTC GIT 2.0 questionnaire. Subscales that assess seven (reflux, distension, diarrhea, fecal incontinence, constipation, emotional well-being, and social functioning) different categories of 34 items included in this scale and comprise the total GIS scores were designed to evaluate the patients' quality of life and severity of GIS symptoms (8,9).All subscales other than diarrhea and constipation are scored from 0.00 to 3.00; the diarrhea and constipation subscale scores range from 0.00 to 2.00 and from 0.00 to 2.50, respectively. A "GIS involvement severity score" can be calculated using the UCLA SCTC GIT 2.0. This score varies between 0.00 and 2.83 and is calculated using all, but constipation, subscales. This test, which has been shown to be valid and reliable for assessing the quality of life of patients with scleroderma, has been translated into French (4), Dutch (1), Romanian (10), Italian (11), Singaporean Chinese (12), and Serbian (13), and validity and reliability analyses have been conducted in these languages.

Until now, there have been no translation and validation of the UCLA SCTC GIT 2.0 questionnaire into the Turkish language for the assessment and follow-up of GIS involvement in Turkish-speaking patients with Ssc.

The purpose of the present study was to adapt the UCLA SCTC GIT 2.0 questionnaire to Turkish and to make it available for use in the Turkish language after performing the validity and reliability analyses.

MATERIALS AND METHODS

Patients

A total of 97 patients who fulfilled the American College of Rheumatology/European League Against Rheumatism classification criteria for SSc, were >18 years old, volunteered for the study, and presented to the Dokuz Eylül University School of Medicine Rheumatology Department between August 2014 and April 2015 were included in the study (14). Patients with both diffuse and limited forms of Ssc according to the LeRoy criteria were also included (15).

Ethics

Consent was obtained from Dr. Khanna via e-mail for the translation of the questionnaire into Turkish and its application. The Dokuz Eylül University Ethics Committee approved the study (approval no. 2015/04-05). Informed consent was obtained from patients with Ssc included in the study.

Table 2. Clinical features of patients with Ssc.

Patient (n)	
Age (years), mean (SD)	55.4 (±11.4)
Female, n (%)	85 (87.6%)
Type of SSc, n (%)	
Diffuse	43 (44.3%)
Limited	49 (50.5%)
Overlap	5 (5.1%)
Disease duration (years), mean (SD)	10.2 (±9.3)
Autoantibodies positive, n (%)	
Antinuclear antibody	89 (92.7%)
Anti-centromere antibody	32 (34.0%)
Anti-topoisomerase-1 antibody	38 (40.0%)
Anti-SSA	6 (6.3%)
Anti-SSB	5 (5.3%)
Modified Rodnan skin score, mean (SD)	7.21 (max: 26, min: 0, SD: ±5.75)
C-reactive protein (mg/l), mean (SD)	5.8 (max: 36, min: 0.2, SD: ±5.72)
Medications, n (%)	
Ongoing PPI, n (%)	88 (92.6%)
Ongoing prokinetics, n (%)	6 (6.3%)
Low dose corticosteroids (<7.5 mg/day), n (%)	48 (50.5%)
Calcium channel blockers, n (%)	69 (72.6%)
Chronic antibiotic therapy, n (%)	0 (0%)
Laxatives, n (%)	1 (0.9%)
Antidiarrheal agents, n (%)	0 (0%)
Antidepressants, n (%)	15 (15.8%)
Hydroxychloroquine, n (%)	33 (34.7%)
Immunosuppressants, n (%)	30 (30.9%)
Azathioprine	18 (18.6%)
Methotrexate	12 (12.4%)
Cyclosporine	1 (0.9%)
Interferon	1 (0.9%)
Rituximab	1 (0.9%)
Forced vital capacity % predicted, mean (SD)	85.7 (min: 37, max: 130, SD: ±17.6)
Diffusion capacity (DLCO) % predicted, mean (SD)	65.05 (min: 28, max: 115, SD: ±18.53)
Pulmonary involvement, n (%)	43 (46.2%)

Ssc: systemic sclerosis, PPI: proton pump inhibitor.

Methods

The UCLA SCTC GIT 2.0 (Supplement 1) was the scale used in the study. Application of the UCLA SCTC GIT 2.0 lasts approximately 6-8 min, and its validity and reliability (test-retest and internal consistency) have been demonstrated in many studies (1,4,8,16,17).

The scale, which consists of 34 items that evaluate the symptom over the past week, is answered on a Likert-type scale. Whereas items 15 and 31 are answerable by yes/no, the remaining 32 items are answered as none, 1-2 days, 3-4 days, or 5-7 days (none: 0; 1-2 days: 1 point; 3-4 days: 2 points; 5-7 days: 3 points; and 1 point for yes and 0 for no). For calculation of the score for each subscale, the scores of the items in that subscale are added and then divided by the number of questions in the scale. For calculation of the total GIS score, the scores for all the subscales, except constipation, are added and then divided by 6 (9).

Translation and cross-cultural adaptation

The UCLA SCTC GIT 2.0 questionnaire was translated and cross-culturally adapted according to the international guidelines by Beaton et al. (18).

Ten patients whose data were not included in the study underwent a preliminary application (Table 1). They were asked to fill out the questionnaire and to provide written comments to every item of the preliminary Turkish UCLA SCTC GIT 2.0. The participants were asked questions about the intelligibility of the expressions in the scale and the ease of reading and filling out the forms. Comments and suggestions were discussed with the expert group, and the result yielded the final Turkish questionnaire.

Statistical methods

Reliability analyses

The time-dependent consistency and internal consistency criteria were analyzed in the context of the reliability of the UCLA SCTC GIT 2.

The time-dependent consistency of the scale was evaluated using the test-retest method. Two weeks after the first application, the questionnaire was applied again to a sample of 29 individuals. The correlation between the first and the second measurements was analyzed by calculating the Spearman's correlation coefficient because consecutive data were being compared.

The Cronbach's alpha reliability coefficient was calculated to analyze the internal consistency of the scale. In the preliminary analysis of data, the collectability of the Likert-type scale was controlled using the Tukey's non-

additive test. The Spearman's correlation coefficient was calculated to analyze the item-total score correlation in the item analyses.

Validity analyses

The validity of the scale was analyzed by assessing structural validity. In the context of structural validity, the factor analysis method was used between the UCLA SCTC GIT 2.0 subdimensions and the SF-36 subdimensions (19).

Exploratory factor analyses were applied. The correlation between the mean total scores obtained in these questionnaires and the mean total scores obtained from the UCLA SCTC GIT 2.0 was determined using the Spearman's correlation coefficient.

Sample size was controlled using the Kaiser-Meyer-Olkin (KMO) test according to the number of items. Factorability was also tested using the Bartlett's test.

Data analyses

The Statistical Package for the Social Sciences version 13.0 (SPSS Inc., Chicago, IL, USA) for Windows was used for data analysis. For evaluation of patients' sociodemographic data, the distributions (numbers and percentages) of the sociodemographic characteristics of patients with Ssc were determined. Results were expressed as mean±SD and median (minimum and maximum values and interquartile range) according to the distribution of data.

RESULTS

Sociodemographic characteristics and clinical features

The mean age of the patients was 55.37±11.35 years, 87.6% of the subjects were female, and 56.7% had an elementary school-level education. Table 2 shows some of the sociodemographic characteristics of the patients.

Demonstration of test-retest reliability

For demonstration of observer internal consistency, 29 out of the 97 patients who completed the UCLA SCTC GIT 2.0 questionnaire were retested with the same scale 2 weeks later. The Spearman's correlation coefficient was 0.821. Intraclass correlation coefficient (ICC) was 0.912. Test-retest reliability was good and significant.

Internal consistency reliability of the UCLA SCTC GIT 2.0

The Cronbach's alpha coefficient was calculated to assess the reliability of the UCLA SCTC GIT 2.0, and internal consistency analyses were performed. The Cronbach's al-

Table 3. Descriptive statistics and internal consistency statistics

UCLA SCTC GIT 2.0 Scale	n	Mean score (SD)	Minimum score	Maximum score	Cronbach's alpha	Floor effect %	Ceiling effect %
Reflux	97	0.64 (0.54)	0.0	2.6	0.83	17.5	0.0
Distension	97	1.02 (0.75)	0.0	3.0	0.58	7.2	1.0
Soilage	97	0.30 (0.72)	0.0	3.0	0.68	82.5	3.1
Diarrhea	97	0.28 (0.47)	0.0	1.5	0.36	69.1	0.0
Social functioning	97	0.17 (0.32)	0.0	1.3	0.47	67.0	0.0
Emotional well-being	97	0.30 (0.43)	0.0	2.2	0.73	41.2	0.0
Constipation	97	0.63 (0.69)	0.0	2.5	0.56	34.0	0.0
Total GIT score	97	0.45 (0.37)	0.0	1.6	0.82	3.1	0.0

All scales are scored from 0.00 (better HRQOL) to 3.00 (worse HRQOL) except the diarrhea and constipation (range from 0.00 to 2.00 and from 0.00 to 2.50, respectively) scores. The UCLA SCTC GIT 2.0 provides a total score of GIT severity and calculated by summation of all scales (except constipation) and ranges from 0.00 to 2.83 (2)

pha coefficient of the scale consisting of 34 items was 0.894. A Cronbach's alpha value >0.70 shows that the scale is reliable. When an item was removed from the scale, the Cronbach's alpha value (Cronbach's alpha if the item was deleted) of the scale was calculated for each item separately (Table 3).

There was no significant increase in the Cronbach's alpha value when any one item was removed.

Structural validity

When the correlation between the SF-36 and the UCLA SCTC GIT 2.0 subscales and total scores was analyzed, a moderate correlation was found between the total GIT score and the SF-36 subscales (Table 4). The highest correlations of subscales were observed for pain (rho value -0.560), vitality (rho value -0.492), mental health (rho value -0.493), and physical functionality (rho value -0.482).

When other correlations were examined, the correlation coefficients between the pain subscale and the UCLA subscales varied between -0.299 and -0.427, and all of these correlations were found to be statistically significant ($p<0.01$). In addition, powerful correlations were found between the reflux score, distension score, and emotional well-being score, which are UCLA SCTC GIT subscales and SF-36 subscales. Correlations between the mental component summary (MCS) and the physical component summary (PCS), which are based on SF-36 subscales, UCLA subscales, and UCLA total scores, were also analyzed. A moderate negative correlation was found between the PCS and the UCLA subscales other than constipation and total scores. Among these, the highest correlations were found between the total score (-0.482) and the distension score (-0.437**). Additionally, correlations between the MCS and the UCLA subscales and total score were moderately negative for reflux, distension, and emotional well-being, and the UCLA total score was low for the soiling, diarrhea, social functionality, and constipation scores.

Factor analysis

All the items in the scale were included in the validity analysis because they were reliable. The KMO measure of the scale's value was 0.748. The result of the Bartlett's test for the scale was <0.001 (0.000). The correlation of each item within itself was assessed using an anti-image correlation, and its place in the validity analysis was controlled. The Rho coefficients of all the analyzed items were >50%. An evaluation of structural validity revealed that questions were collected under 10 factors found as a result of exploratory factor analyses performed on all the questions first, and 71.6% of the total variance was explained. The minimum eigenvalue was accepted as 1.00 in the analysis. Item 11, which could not be collected under any factor, had an equally distributed burden; a negative value was deleted, and the remaining questions were analyzed again. The remaining 33 items were collected under a total of 9 factors, and 70.1% of the total variance could be explained. The items were analyzed again one by one, and those that which could not be collected under any factor, had an equally distributed burden, or had a negative value (items 1 and 26) were deleted again, and the remaining 31 items were analyzed for the third time. These 31 items were collected under 9 factors, and 71.87% of the total variance could be explained. At this point, all questions could be collected under any factor.

Table 4. External consistency statistics: correlation between SF-36 items and component summaries and UCLA SCTC GIT 2.0 items

UCLA SCTC GIT 2.0/SF-36	RF	RP	RE	VT	MH	SF	BP	GH	PCS	MCS
Reflux	-0.300**	-0.436**	-0.296**	-0.421**	-0.373**	-0.235*	-0.427**	-0.312**	-0.386**	-0.313**
Distension	-0.461**	-0.422**	0.258*	-0.465**	-0.474**	-0.340**	-0.427**	-0.408**	-0.437**	-0.354**
Soilage	-0.237*	-0.160	0.001	-0.170	-0.165	-0.131	-0.328**	-0.114	-0.254*	-0.027
Diarrhea	-0.265**	-0.258*	-0.180	-0.216*	-0.215*	-0.146	-0.325**	-0.083	-0.296**	-0.174
Social functioning	-0.208*	-0.203*	-0.242*	-0.149	-0.271**	-0.210*	-0.400**	-0.242*	-0.300**	-0.243*
Emotional well-being	-0.397**	-0.379**	-0.433**	-0.334**	-0.372**	-0.337**	-0.445**	-0.263**	-0.304**	-0.368**
Constipation	-0.163	-0.101	-0.199	-0.047	-0.063	-0.166	-0.299**	-0.065	-0.167	-0.132
Total GIT score	-0.482**	-0.453**	-0.321**	-0.492**	-0.493**	-0.369**	-0.560**	-0.395**	-0.482**	-0.343**

*p<0.05, **p<0.01

RF: physical functioning, RP: role limitations due to physical health, RE: role limitations due to emotional problems, VT: vitality, MH: mental health, SF: social functioning, BP: bodily pain, GH: general health, PCS: physical component summary, MCS: mental component summary

DISCUSSION

In the present study, we developed the Turkish version of the UCLA SCTC GIT 2.0 questionnaire and evaluated the reliability and validity of the adapted scale. The Turkish GIT 2.0 questionnaire was found to have good internal consistency, high reliability, and an acceptable validity. To the best of our knowledge, this is the first study to make translation and validation of the Turkish version of this scale. The original UCLA SCTC GIT 2.0 questionnaire, which was developed in 2009 (9), was translated into French (4), Dutch (1), Romanian (10), Italian (11), Singaporean Chinese (12), and Serbian (13) before our study. The age and gender distribution of our patients with Ssc was almost similar as the other translation and validation studies and the original report. Our study included patients with limited and diffuse forms of SSc with a balanced rate (50.5% and 44.3%, respectively), and this rate was similar with the patient group of the French and Dutch validation studies. The Romanian, Italian, and Serbian studies included a high number of limited patient populations with Ssc (between 70% and 75%). It can be predicted that the type of scleroderma involvement is important in terms of especially quality of life questions; therefore, it was seen that patient types are balanced in our study.

Following linguistic validity studies of the scale, reliability analyses were conducted. The Cronbach's alpha coefficient was calculated to evaluate the reliability of the UCLA SCTC GIT 2.0, and internal consistency analyses were performed. In addition, the collectability of the Likert-type scale was checked using the Tukey's nonadditive test in the preliminary data analysis. The Cronbach's alpha coefficients of the scale consisting of 34 items were as follows: original study: 0.71, French: 0.69, Dutch: 0.921, Romanian: 0.931, Italian: >0.70, Singaporean Chinese: 0.928, and Serbian: >0.69 (1,4,9-12,13). In our study, the Cronbach's alpha coefficient was found to be 0.894. The Cronbach's alpha coefficients were ≥0.70 in all the studies, indicating that the scales are reliable. In the present study, the Cronbach's alpha value of the scale (Cronbach's alpha if the item was deleted) was calculated for each item separately when that item was removed from the scale. There was no significant increase in the Cronbach's alpha value in case of removal of any item. Each question increased the information obtained and the reliability. These results indicate that the UCLA SCTC GIT 2.0 can be successfully used in clinical studies that aim to measure the success of GIT therapy.

The Spearman's correlation between the SF-36 subscales and the subscale scores of the UCLA SCTC GIT 2.0 questionnaire was submitted to the item analysis. The results were similar to those of previous studies. In our study, there was a moderate -0.372 correlation between the UCLA emotional well-being subscale and the MCS, and this finding was similar to the correlations found in the French (-0.38), Dutch (-0.64), Romanian (-0.55), Italian (-0.37), and Singaporean studies (-0.298) (1,4,10-12). Although the correlation between the UCLA social functionality subscale and the SF-36 social functionality subscale was statistically significant in our study, it was <0.30, with r=-0.210 ($p<0.05$). Correlations between the same scales were found at similar levels in the French (r=-0.27, $p<0.05$), Romanian (r=-0.31, $p<0.05$), and Italian studies (r=-0.37, $p<0.05$) (4,10,11). Correlations between the social functionality subscales were not significant in the Dutch (r=-0.0517, $p<0.05$) and Singaporean studies (r=-0.337, $p<0.0001$) (1,12).

In the subscale analysis, the pain subscale had the most powerful correlation with the UCLA subscales among the SF-36 subscales. In the original and French studies, the highest correlations were seen with the physical role limitation subscale and the emotional role limitation, vitality, mental health, and social functionality subscales, which are mental health subscales (4,9). Additionally, in the Dutch study, there was a higher correlation between the GIT subscales and the social role functioning score rather than the SF-36 mental component (1). While no correlation was found between the UCLA subscales and the physical functionality subscale in the French, Dutch, Italian, and Romanian studies, a moderate correlation was found in our study (1,4,10,11). In the Italian study, there was no significant correlation between physical functions on the SF-36 and symptom domains of the UCLA SCTC GIT 2.0 apart from constipation and role physical subscale of the SF-36 (11).

When correlations between the SF-36 MCS and the UCLA subscales and total score are analyzed, negative moderate correlations were found between the reflux, distension, emotional well-being, and total scores. The correlation between the MCS and the UCLA subscales in our study was rather similar to that reported in the Dutch study (1). However, contrary to our study and the Dutch study, a correlation was found between the soiling score and the MCS in the French study (1,4). In the Italian study, there was no correlation between the MCS and the reflux, distension, fecal soiling, diarrhea, social functioning, and constipation scores (11). A moderate correlation was found between the MCS and the emotional well-being score. The most powerful correlations in the Italian study

were between the reflux and emotional well-being and emotional role functioning in the SF-36 (11).

When correlations between the SF-36 PCS and the UCLA subscales and total score were considered, a moderate negative correlation was found between reflux, distension, diarrhea, social functionality, emotional well-being, and the total UCLA scores. These correlations were more powerful than those in the French, Dutch, Italian, and Romanian studies (1,4,10,11). In the French study, a moderate correlation was found between the SF-36 PCS and the reflux, distension, social functionality, and the total scores (4). Similarly, a moderate negative correlation was found between the SF-36 PCS and the distension and total UCLA scores in the Dutch study only (1). A possible explanation for these results is that the GI involvement of the patients in our study group had a greater impact on the physical component score than on the mental component score.

When correlations were analyzed, the total GIT ICC was good, with a value of 0.821. There was also good internal consistency among the UCLA subscales other than diarrhea. An ICC of >0.7 was found between the reflux, emotional well-being, and total UCLA scores; a moderate ICC of 0.4-0.7 was found for the distension, fecal soiling, social functionality, and constipation subscales. The correlation of the diarrhea subscale was 0.356, which was not statistically significant. In the French and Dutch studies, the correlation of the diarrhea subscale was low (1,4). However, the ICC values were rather high for all subscales in the Singaporean study (12). The correlation of the social functionality subscale was 0.467 (p=0.012). Correlations among the UCLA subscales were also similar in the Dutch study (1). The ICC scores of the distension, fecal soiling, and constipation subscales were 0.4-0.7 in the Dutch study, and these results were somewhat consistent with those of our study (1). Additionally, in the Dutch study, the total GIT score test-retest reliability was acceptable, with a value of 0.749 (1). While social functionality showed a low test-retest reliability (ICC<0.4) in the Dutch study, the social functionality ICC score had a reliability of 0.467 in our study (1). In the Italian study, a strong stability was found for the reflux, emotional well-being, and constipation subscales (correlation coefficients of 0.95, 0.79, and 0.75, respectively) (11). However, moderate to poor reliability was found for the total GIT score and the fecal soiling subscale. Higher ICC values were found in the original study. This can be explained by a change in the patients' GI symptoms during the mean period of 2 weeks between test and retest. It is likely that ICC scores will be low in cases of unstable disease. Another possible explanation is that the patients failed to provide completely correct answers to the questions. Almost three-fourths of the patients in our study had an education level of elementary school or lower. As stated in our study, patients must fully understand the scale, take adequate time to answer it, and provide correct answers in scale studies focusing on health perception. Stronger studies are only possible with the inclusion of more educated and larger patient groups. Factor analysis was used for validity analysis. The KMO value for the scale was 0.748. Its factorability was tested using the Bartlett's test. The Bartlett's test result for the scale was <0.001 (0.000). For evaluation of structural validity, the 6th question could not be collected under any factor, and its burden was equally distributed. At the same time, the 11th question could not be collected under any factor during the structural validity evaluation, and its burden was not distributed equally. Therefore, the 11th question was removed from the factor analysis.

In conclusion, the UCLA SCTC GIT 2.0 questionnaire adapted to Turkish showed good internal consistency, high reliability, and acceptable validity. It is suitable for use in the assessment and follow-up of GIS symptoms in Turkish-speaking patients with Ssc.

Ethics Committee Approval: Ethics committee approval was received for this study from Dokuz Eylül University Institutional Review Board (Approval No: 2015/04-05).

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

Peer-review: Externally peer-reviewed.

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