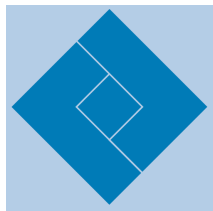


CONTINENCE CARE



Validity and Reliability of a Turkish Version of the Fecal Incontinence Quality of Life Scale

Ozden Dedeli ■ Cicek Fadiloglu ■ Serhat Bor

PURPOSE: Anorectal disorders, including fecal incontinence, are a significant healthcare problem that produce bothersome symptoms and adversely affect quality of life. We sought to establish the validity and reliability of a Turkish language version of the Fecal Incontinence Quality of Life Scale (FIQOLS).

SUBJECTS AND SETTING: Data were collected at the Fecal Incontinence-Constipation-Biofeedback Clinic, located in the Gastroenterology Department at Ege University School of Medicine Hospital in Izmir, Turkey. The study sample comprised patients with fecal incontinence who attended the clinical assessment and agreed to participate in the study.

INSTRUMENTS: A sociodemographic questionnaire form, the 29-item FIQOLS, and the Fecal Incontinence Severity Index (FISI), as well as the 36-Item Short Form Health Survey (SF-36) were administered to subjects. Both the FIQOLS and FISI were translated from English to Turkish by using a back-translation technique.

METHODS: Subjects initially completed the FIQOLS, FISI, and the SF-36 at baseline and again after a 2-week interval to allow test-retest reliability measurement. Internal consistency was also measured, using the Cronbach α and Spearman-Brown split-half coefficients. Test-retest reliability was evaluated using interclass correlation coefficient testing. The validity of FIQOLS with respect to the SF-36 and FISI was analyzed using Pearson correlation coefficients.

RESULTS: Fifty subjects with fecal incontinence participated in the study; their mean age (SD) was 57.1 (± 15.7) years. Almost two-thirds (66%) were female, and 38% did not complete primary school education. Test-retest reliability analysis revealed an intraclass correlation of r value higher than 0.70 ($P < .05$). The overall Cronbach α coefficient of instrument was .88; the Spearman-Brown split-half value was 0.84 for the first half of the tool and 0.76 for the second half. The Cronbach α coefficient for subfactors varied from .56 to .82. The FIQOLS score was found to have a statistically significant ($P < .05$) correlation with both the FISI and SF-36.

CONCLUSION: These findings support the Turkish language version of the FIQOLS as a valid and reliable instrument.

Introduction

Fecal incontinence (FI) is defined as involuntary loss of anal sphincter control resulting in uncontrolled release of gas, liquid, or solid stool.¹ The prevalence of FI in the general community of the United Kingdom is 5.4%, but it rises to 11% to 17% among community dwelling elders. FI affects 3.3% of the Turkish population² and 9.5% of nursing home residents.³

Although FI is not a life-threatening condition, it impairs social, emotional, and physical functions. The effect of FI on an individual's general well-being is influenced not only by the type and severity of symptoms but also by the individual's ability to adapt or cope with these symptoms.¹ The impact of FI on the individual's quality of life should be evaluated by using a validated instrument. Two types of instruments have been developed to measure quality of life in patients with FI. Generic scales, such as the 36-Item Short Form Health Survey (SF-36), measure generic health-related quality of life. In contrast, condition-specific scales, such as the Gastrointestinal Quality of Life Index, measure the impact of a specific condition on health-related quality of life.⁴ The Fecal Incontinence Quality of Life Scale (FIQOLS) was developed in 2000.⁵ This instrument comprises 29 items measuring 4 subscales or domains (lifestyle, coping/behavior, depression/self-perception, and embarrassment) in patients with FI.⁵ The instrument was originally validated in English. However, Italian, French, Spanish, and Portuguese language versions have been developed and tested for validity and reliability.^{4,5}

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TABLE 1.**Fecal Incontinence Severity Index^a**

Checklist	2 or More Times a Day	Once a Day	2 or More Times a Week	Once a Week	1-3 Times a Month	Never
Gas	12/9	11/8	8/6	6/4	4/2	0
Mucus	12/11	10/9	7/7	5/7	3/5	0
Stool						
Liquid	19/18	17/16	13/14	10/13	8/10	0
Solid	18/19	16/17	13/16	13/16	8/11	0

^aValues are expressed as the ratio of patient's rating of severity to surgeon's rating of severity.

Measurement of the severity of FI is important when evaluating quality of life because patients who rank their FI as more severe also tend to rate their quality of life lower than those with less severe symptoms.⁶ Instruments that measure FI severity focus on 2 principal factors, the character and frequency of incontinence. Two validated instruments, the Wexner score⁷ and Fecal Incontinence Severity Index (FISI)⁸ have been developed that measure FI severity. We sought to adapt the FIQOLS and FISI to the Turkish language.

■ Methods

Instruments

Permission was obtained for the use of the original (English language) version of the FIQOLS and FISI. The FIQOLS comprises 29 items measuring 4 domains of health-related quality of life: lifestyle (10 items), coping/behavior (9 items), depression/self-perception (7 items), and embarrassment (3 items). All but one of the items are scored on an ordinal scale of 1 to 4; a score of 1 indicates lower quality of life and a score of 4 indicates a higher perceived quality of life. A single item in the depression/self-perception scale is scored on a scale of 1 to 5. The score for each domain is calculated by determining the mean score for all items within that subscale.

The FISI was also employed. The FISI is a 4-item self-administered severity index indicating the frequency of loss of gas, mucus, liquid, or stool, whose items are shown in Table 1.

Psychometric Properties

Reliability

Reliability was established by measuring internal consistency and test-retest coefficients. The internal consistency (reliability) of each domain within the FIQOLS was tested using the Cronbach α and Spearman-Brown split-half coefficients. A score of less than 0.50 was deemed poor internal consistency, scores ranging from 0.51 to 0.69 were deemed suspicious, scores ranging from 0.70 to 0.80 were deemed acceptable, scores ranging from 0.81 to 0.90 were deemed good, and a score greater than 0.90 indicated excellent internal consistency.⁹

Test-retest reliability, which measures the temporal stability of the instrument, was measured by repeated

administration following 7 to 10 days during which no change was expected to occur. An interclass correlation coefficient (ICC) for each scale was calculated. Scores of 0 to 0.25 were judged very poor, 0.26 to 0.49 were judged poor, 0.50 to 0.69 were judged average, 0.70 to 0.89 were deemed strong, and those higher than 0.9 were deemed very strong.⁹

Validity

Content validity The translation of the FIQOLS and FISI into the Turkish language was performed by the study team. The study team included the authors, a colorectal surgeon, a neurologist with expertise in evaluating functional digestive disorders, and a psychologist with expertise in quality-of-life instruments. All members of the study team are able to read and speak the English language. Items were initially translated, and some expressions were modified to adapt them to the Turkish language and culture. The instrument was then back-translated from Turkish to English. After consensus among the

TABLE 2.**Demographic Characteristics**

Characteristics	n (%)
Age group, y	
18-42	12 (24)
43-62	27 (54)
63-82	11 (22)
Sex	
Female	33 (66)
Male	17 (34)
Marital status	
Married	36 (72)
Single	6 (12)
Widow	8 (16)
Educational status	
University	6 (12)
High school	15 (30)
Primary school	25 (50)
Illiterate	4 (8)
Total (N)	50 (100)

TABLE 3.
Internal Reliability and Temporal Stability of Total Scale and Each of Domains

Domains	Items	<i>r</i>	<i>P</i>	Cronbach α
Lifestyle	I am afraid to go out.	0.94 ^a	.001	.82
	I avoid visiting friends.			
	I avoid staying overnight away from home.			
	It is difficult for me to get out and do things like going to a movie or to church.			
	I cut down on how much I eat before I go out.			
	It is important to plan my schedule (daily activities) around my bowel pattern.			
	I avoid traveling.			
	I cannot do many of things I want to do.			
Coping/behavior	I avoid traveling by plane or train.	0.90 ^a	.001	.73
	I avoid going out to eat.			
	Whenever I am away from home, I try to stay near a restroom as much as possible.			
	I worry about not being able to get to the toilet in time.			
	I feel I have no control over my bowels.			
	I can't hold my bowel movement long enough to get to the bathroom.			
	I try to prevent bowel accidents by staying very near a bathroom.			
	I worry about bowel accidents.			
	I have sex less often than I would like to.			
	The possibility of bowel accidents is always on my mind.			
Whenever I go some place new, I specifically locate where the bathrooms are.				
Depression/ self-perception	Q1. In general, would you say your health is:	0.88 ^a	.001	.65
	I feel depressed.			
	I feel like I am not a healthy person.			
	I enjoy life less.			
	I feel different from other people.			
	I am afraid to have sex.			
	During the past month, have you felt so sad, discouraged, hopeless, or had so many problems that you wondered if anything was worthwhile?			
Embarrassment	I feel ashamed.	0.76 ^b	.015	.56
	I leak stool without even knowing it.			
	I worry about others smelling stool on me.			
Total scale	29	0.97 ^a	.001	.88

^aCorrelation is significant at the $P < .01$ level.

^bCorrelation is significant at the $P < .05$ level.

researchers, the translated version was administered to 10 subjects (6 women and 4 men, mean age 47 ± 12.5 years), including 4 with FI. The primary purpose of this evaluation was to determine the level of comprehension of the questionnaire when administered to Turkish patients. The final versions of the questionnaires were labeled in Turkish—the Fekal Inkontinans Yasam Kalitesi Olcegi and Fekal Inkontinans Ciddiyet Indeksi. Content validity was then reevaluated using the FIQOLS and FISI.

Convergent validity Convergent validity was analyzed by evaluating the correlation between the 4 domains of the FIQOLS and appropriate dimensions of the SF-36 (Pearson correlation coefficient). Pearson correlation coefficient scores between 0 to 0.25 were judged very poor, 0.26 to 0.49 were judged poor, 0.50 to 0.69 were judged average, 0.70 to 0.89 were deemed strong, and scores greater than 0.9 were deemed very strong.¹⁰

TABLE 4.**Exploratory and Confirmatory Factor Analysis**

Factors	Items	Factor Loading	Eigenvalue	% Of Variance
Lifestyle	I am afraid to go out.	0.82	5.20	18.26
	I avoid visiting friends.	0.79		
	avoid staying overnight away from home.	0.69		
	It is difficult for me to get out and do things like going to a movie or to church.	0.45		
	I cut down on how much I eat before I go out.	0.46		
	It is important to plan my schedule (daily activities) around my bowel pattern.	0.32		
	I avoid traveling.	0.70		
	I cannot do many of things I want to do.	0.64		
	I avoid traveling by plane or train.	0.51		
	I avoid going out to eat.	0.48		
Coping/behavior	Whenever I am away from home, I try to stay near a restroom as much as possible.	0.77	3.62	12.75
	I worry about not being able to get to the toilet in time.	0.66		
	I feel I have no control over my bowels.	0.45		
	I can't hold my bowel movement long enough to get to the bathroom.	0.68		
	I try to prevent bowel accidents by staying very near a bathroom.	0.45		
	I worry about bowel accidents.	0.94		
	I have sex less often than I would like to.	0.48		
	The possibility of bowel accidents is always on my mind.	0.52		
	Whenever I go some place new, I specifically locate where the bathrooms are.	0.58		
Depression/ self-perception	Q1. In general, would you say your health is:	0.46	3.94	13.80
	I feel depressed.	0.53		
	I feel like I am not a healthy person.	0.70		
	I enjoy life less.	0.37		
	I feel different from other people.	0.62		
	I am afraid to have sex.	0.54		
	During the past month, have you felt so sad, discouraged, hopeless, or had so many problems that you wondered if anything was worthwhile?	0.94		
Embarrassment	Q4. Due to accidental bowel leakage,			
	I feel ashamed.	0.51		
	I leak stool without even knowing it.	0.90		
	I worry about others smelling stool on me.	0.93		

Divergent validity The analyzed divergent validity of the FIQOLS of the 4 domains of the Turkish FIQOLS were correlated with items from the FIS1 querying severity of incontinence. Pearson correlation coefficient scores of 0 to 0.25 were deemed very poor, 0.26 to 0.49 were judged poor, 0.50 to 0.69 were judged average, 0.70 to 0.89 were deemed strong, and scores higher than 0.9 were judged very strong.¹⁰

Study Procedures

The setting for the study was the Fecal Incontinence-Constipation-Biofeedback Clinic, located within the Gastroenterology Department of Ege University School of Medicine Hospital in Izmir, Turkey. Subjects were recruited between March and July 2006. Fifty patients older than 18 years agreed to participate. The subjects completed the Turkish language version of the FIQOLS,

TABLE 5.
Pearson Correlation Coefficient Between Domains of the FIQOLS and Domain of SF-36 Scores

SF-36	FIQOLS			
	Lifestyle	Coping/Behavior	Depression/Self-perception	Embarrassment
Physical functioning	0.39 ^a	0.48 ^a	0.36 ^a	0.73 ^b
Role limitations (physical)	0.46 ^b	0.39 ^a	0.35 ^a	0.55 ^b
Bodily pain	0.27	0.19	0.14	0.24
Health perceptions	0.42 ^b	0.41 ^a	0.55 ^b	0.22
Energy/vitality	0.50 ^b	0.43 ^a	0.34 ^a	0.19
Social functioning	0.35 ^a	0.30 ^a	0.31 ^a	0.84 ^b
Role limitations (emotional)	0.43 ^a	0.64 ^b	0.32 ^a	0.76 ^b
Mental health	0.34 ^a	0.32 ^a	0.56 ^b	0.24

Abbreviations: FIQOLS, Fecal Incontinence Quality of Life Scale; SF-36, Medical Outcomes Survey Short-Form 36.

^aCorrelation is significant at the $P < .05$ level.

^bCorrelation is significant at the $P < .01$ level.

together with the Turkish version of the SF-36. They also completed the Turkish language version of the FISI. Subjects again completed the FIQOLS and the FISI following 2 weeks. Patients were assisted by the principal investigator (O.D.) if they experienced difficulty or raised questions when completing the instrument. Study procedures were reviewed and approved by the human ethics committee of Ege University.

Statistical Analysis

Descriptive statistics were used to analyze subject characteristics. FIQOLS reliability was evaluated via 2 measures of internal consistency: the Cronbach α coefficient and the Spearman-Brown split-half coefficient. Test-retest was analyzed via ICC. Analysis of the validity of the Turkish language FIQOLS was established by measuring Pearson correlation coefficients of the Turkish language FIQOLS to SF-36 and FISI scores. P values less than .5 were considered statistically significant.

Results

The translation/back-translation process revealed minor inconsistencies in 2 items. The phrase in item 2A, "I am afraid to go out," was changed to "I am afraid to go out of home" in the Turkish language version. Similarly, item 2D states, "It is difficult for me to get out and do things like going to a movie or to church." Because most citizens of Turkey are Muslims, the word "church" was changed to "mosque."

Subjects

Thirty-three women and 17 men with an average age of 57.14 (± 15.69) years completed the study. Fifty-eight percent of participants had less than a high school education, 30% completed high school, and 12% attended university (Table 2). The average severity of incontinence, according to the FISI, was 31.7 (± 12.8). All patients reported incontinence of solid stool, liquid stool, and gas.

Psychometric Testing

Table 3 summarizes internal consistency and temporal stability of the FIQOLS. The overall Cronbach α value for the instrument was .88. The Spearman-Brown split-half value was 0.84 for the first half and 0.76 for the second half. Temporal stability testing revealed an overall ICC of 0.97 (very strong). ICC values were very strong for lifestyle (ICC = 0.84) and coping/behavior domains (ICC = 0.90) and were strong for the depression/self-perception (ICC = 0.88) domain. However, ICC values were lower than desired for the embarrassment domain (ICC = 0.76).

Kaiser-Meyer-Olkin (0.64) and Bartlett's Test of Sphericity ($\chi^2 = 2173.41$; $P < .000$) sample testing magnitude analyses were completed and found sufficient enough for factor analysis.¹¹ Table 4 summarizes results of the exploratory and confirmatory factor analysis. It revealed that factor loading of items in the instrument varied from 0.32 to 0.94 and included 4 factors overlapping the original form. The Cronbach α coefficient for the sub-factors varied from .56 to .82.

TABLE 6.
Pearson Correlation Coefficient Between Scores of FISI and Domain Scores From the FIQOLS

FIQOLS Domain	FISI	
	r	P
Lifestyle	0.88 ^a	.001
Coping/behavior	0.87 ^a	.001
Depression/self-perception	0.83 ^a	.001
Embarrassment	0.76 ^b	.016

Abbreviations: FIQOLS, Fecal Incontinence Quality of Life Scale; FISI, Fecal Incontinence Severity Index.

^aCorrelation is significant at the $P < .01$ level.

^bCorrelation is significant at the $P < .05$ level.

TABLE 7.**The Turkish Version Fecal Incontinence Quality of Life Scale's Cronbach α Values Versus Values Reported by Other Researchers**

	Researchers			
	Rockwood et al ⁵	Rullier et al ¹⁵	Minguez et al ¹⁴	Dedeli et al
	English	French	Spanish	Turkish
Lifestyle	.96	.92	.96	.82
Coping/behavior	.94	.84	.95	.73
Depression/self-perception	.92	.86	.92	.65
Embarrassment	.84	.51	.85	.56
Number of subjects in the study, <i>N</i>	118	100	111	50

Convergent validity was tested by calculating Pearson correlation coefficients (r) between the 4 domains of the FIQOLS and the subscales of the SF-36 (Table 5). All were statistically significant, confirming that the FIQOLS possesses adequate convergent validity when compared with the well-validated SF-36.

To analyze the divergent validity, the 4 domains of the FIQOLS were correlated to the FISI (Table 6). As anticipated, the relationship between these scores was positive, proportional, and statistically significant ($r > 0.70$; $P < .05$).

Discussion

Results of this study demonstrate validity and reliability of the Turkish language version of the FIQOLS. The Portuguese version of the instrument was developed and found to be valid and reliable in 50 patients with anal incontinence.¹² Similarly the Italian language version was studied in 73 persons with FI and compared to findings in 8 healthy controls.¹² It also proved to be valid and reliable and was judged to be useful as both a research and clinical tool. However, Turkish culture is a hybrid of Eastern and Western lifestyles, and the results of this study suggest that the instrument can be adapted to Eastern cultures.

Our analysis supported both convergent and divergent validity when compared to SF-36 and FISI scores. Altomare and colleagues¹³ also assessed convergent validity of an Italian version of the FIQOLS and found a statistically significant correlation ($P < .001$) between the embarrassment domain of the FIQOLS and both physical role and mental health domains of the SF-36. They also found evidence of divergent validity when scores were compared to that of the Wexner score, an instrument that is designed to measure FI severity.

Although the Cronbach α values we obtained tended to be lower than those reported when the instrument was originally tested for reliability⁵ or when the Portuguese,¹² Italian,¹³ Spanish,¹⁴ and French¹⁵ language versions were tested, the results of our study demonstrate that the Turkish version of the FIQOLS retains acceptable internal

consistency (Table 7). In contrast, although the temporal stability of 3 domains is acceptable, significant differences were found when scores on the embarrassment domain were compared at baseline and on follow-up administration. We believe that a change in FI severity was not the cause of these differences, since scores in the 3 other domains remained unchanged. Alternative explanations for the temporal instability in this domain include cultural differences or the comparatively small number of items within the embarrassment subscale ($n = 3$).

Conclusion

The Turkish version of the FIQOLS remains valid and reliable when administered to Turkish persons with FI. Our results support its use in both the clinical and research settings.

References

1. Kenefic N. The epidemiology of faecal incontinence. In: Norton C, Chelvanayagam S, eds. *Bowel Continence Nursing*. Beaconsfield, United Kingdom: Beaconsfield Publishers; 2004:14-22.
2. Bor S. Prevalence of gastroesophageal reflux disease and functional bowel disorders in Turkey. Paper presented at: 22nd National Gastroenterology Congress August 30-September 4; 2005; Malatya, Turkey.
3. Dedeli O, Tekin N, Turan I, Fadiloğlu C, Bor S. Fecal incontinence prevalence and effect of quality of life in elderly individuals who live in nursing homes within city of Izmir. Paper presented at: 6th National Geriatric Congress October 16-20; 2007; Antalya, Turkey.
4. Rockwood TH. Incontinence severity and QOL scales for fecal incontinence. *Gastroenterology*. 2004;126(1)(suppl 1):S106-S113.
5. Rockwood TH, Church JM, Fleshman JW, et al. Fecal Incontinence Quality of Life Scale: quality of life instrument for patients with fecal incontinence. *Dis Colon Rectum*. 2000;43:9-17.
6. Chelvanayagam S, Wilson S. Psychosocial aspects of patients with faecal incontinence. In: Norton C, Chelvanayagam S, eds. *Bowel Continence Nursing*. Beaconsfield, United Kingdom: Beaconsfield Publishers; 2004:33-44.
7. Jorge JM, Wexner SD. Etiology and management of fecal incontinence. *Dis Colon Rectum*. 1993;36:77-97.

8. Rockwood TH, Church JM, Fleshman JW, et al. Patient and surgeon ranking of the severity of symptoms associated with fecal incontinence: the fecal incontinence severity index. *Dis Colon Rectum*. 1999;42:1525-1532.
9. Cronbach LJ. Coefficient alpha and the internal structure of tests. *Psychometrika*. 1951;16:297-334.
10. Campbell DT, Fiske JL. Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychol Bull*. 1959;56:85-105.
11. Kaiser HF. An index of factorial simplicity. *Psychometrika*. 1974;39:31-36.
12. Yusuf SA, Jorge JM, Habr-Gama A, Kiss DR, Rodrigues JG. Evaluation of quality of life in anal incontinence: validation of the questionnaire FIQL (Fecal Incontinence Quality of Life). *Arq Gastroenterol*. 2004;41(3):202-208.
13. Altomare DE, Rinaldi M, Giardiello GG, et al. Italian translation and prospective validation of fecal incontinence quality of life (FIQL) index. *Chir Ital*. 2005;57(2):153-158.
14. Minguez M, Garrigues V, Soria MJ, Andreu M, Mearin F, Clave P. Adaptation to Spanish language and validation of the fecal incontinence quality of life scale. *Dis Colon Rectum*. 2006;48:490-499.
15. Rullier E, Zerbib F, Marrel A, Amouretti M, Lehur PA. Validation of French version of the Fecal Incontinence Quality-of-Life (FIQL) scale. *Gastroenterol Clin Biol*. 2004;28(6/7, pt 1):562-568.

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