ARTICLE

The validity and reliability of the Turkish version of the 6-item female sexual function index (FSFI-6) and the relationship between climacturia and female sexual dysfunction

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This study aims to assess the validity and reliability of the Turkish version of the FSFI-6 questionnaire,an abbreviated version of FSFI-19,a common tool for evaluating female sexual function. The study included 120 female patients aged between 18–65 years who presented to the urology clinic between December 2019 and March 2020. The Turkish version of FSFI-6 was translated from the English version for validation. The abridged FSFI-6 questionnaire consists of questions 2, 4, 7, 11, 16, and 17 of the FSFI-19 form. We recorded the demographic data of the patients. All subjects filled out the FSFI-19 and FSFI-6 questionnaires. The patients were asked to fill out the questionnaires again after two weeks. The mean age of the subjects was 46.58 ± 9.89 years (28–63). The results of the reliability analysis indicated that the intraclass correlation coefficient of the total FSFI-6 score was 0.92 (weighted kappa coefficients of individual items, 0.868–0.975) and the Cronbach's alpha was 0.862. The validity analysis indicated that the mean total FSFI-6 score was strongly correlated with the mean FSFI-19 score ($p < 0.001$, $r = 0.997$). In the test-retest analysis,the kappa coefficient was calculated as 0.891. The FSFI-19 and FSFI-6 scores of the patients with ($n = 52$) and without climacturia ($n = 68$) were compared, and it was observed that the scores of the patients with climacturia were significantly lower than those without climacturia ($p < 0.001$). The abbreviated FSFI-6 questionnaire is a valuable tool for screening women with FSD. It can be used more extensively due to being short and easy to apply. Our results approve the Turkish version of the questionnaire as a valid and reliable tool for evaluating FSD.

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INTRODUCTION

Female sexual dysfunction (FSD) can result from various reasons and these commonly unrecognized conditions often coexist in a complex manner. Since FSD can result from numerous factors, either isolated or together, diagnosis can be difficult [1]. Different studies report the prevalence of sexual dysfunction to range from 20% to 40% in the female population [1, 2]. Even though FSD increases with age, the true prevalence reported in the literature varies [3]. This variation most likely results from cultural factors, the physician–patient relationship, and not having standard diagnostic criteria [4]. FSD can be difficult to evaluate because of the numerous factors affecting women and the numerous and potentially comorbid conditions that can cause sexual dysfunction.

Multiple tools have been developed to evaluate FSD [5–7]. Female Sexual Function Index-19 (FSFI-19) is a frequently used and valid method of measuring sexual dysfunction [8]. FSFI-19 helps safely assess female sexual function, and its effectiveness in different age groups has been demonstrated by several studies [9, 10]. FSFI-19 was translated into Turkish and validated, and since then, it has also been used in the assessment of sexual function among Turkish women [10]. However, it can be impractical to apply the 19-item questionnaire due to the limited time allocated per patient and the reluctance of some patients in answering all questions [11]. A similar problem has been previously observed in male patients. Subsequently, the International Index of Erectile Function (IIEF) questionnaire has been abbreviated into a five-item form and validated, the effectiveness of which has been demonstrated by clinical studies [12]. Analyses have indicated that the short form can also be used to evaluate male sexual function [13].

Incontinence during sexual activity negatively affects women's sexual function [14]. The type of coital incontinence is determined by the timing of urine leakage during intercourse. Coital incontinence occurs during penetration. Climacturia or orgasm-associated incontinence occurs during orgasm and is often associated with detrusor overactivity. Sexual incontinence (SI) indicates urine leakage during sexual activity at any time [15]. Most women evaluate coital incontinence as an embarrassing hygienic problem and as a barrier to social interaction [16]. The fear or stress associated with incontinence during intercourse causes women to refrain from sex [17].

In light of these studies, researchers have considered that an abbreviated form of FSFI-19 could be more effective for clinical application. After its validation, the 6-item short form of FSFI-19 was translated into many languages and validated for clinical use

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[18–23]. These validation studies allow a quicker, reliable and effective sexual function assessment.

In this study, we aimed to translate the 6-item abridged form of FSFI-19 into Turkish and validate it for clinical use to ensure a rapid, valid and reliable assessment of female sexual function in clinical practice.

METHODS

This study was granted ethical approval by the Ethics Committee of Izmir Katip Celebi University Hospital.

The corresponding author has provided suggestions and opinions and granted permission for this study. The FSFI-6 questionnaire was translated into Turkish separately by two authors, both of whom were fluent in English. These translations were then edited by a linguist with a degree in English philology. After the required changes, the Turkish version was applied to five women to determine content integrity. Subsequently, the final version of the Turkish translation was established, and the questionnaire was translated back into English by a different translator (an English teacher). The original author of the questionnaire was contacted, and the Turkish version of FSFI-6 was finalized after their approval (Supplementary File). The study included 120 female patients aged between 18 and 65 years who presented to the urology clinic between December 2019 and March 2020 for an overactive bladder and who did not hesitate to talk about their sex lives. The exclusion criteria were as follows: not having had a sexual partner for at least six months, having received anti-estrogen therapy for any reason, a history of gynecologic or breast cancer, not understanding written Turkish, filling out FSFI-19 but not coming back to fill out FSFI-6, and not answering or choosing not to answer at least one question. The demographic data of the patients were recorded. The patients were asked whether they had urinary incontinence during sexual intercourse and self-administered the FSFI-19 and FSFI-6 questionnaires. Afterward, the patients were asked to come back to the clinic to retake the FSFI-6 questionnaire after 15–21 days. The subjects filled out the questionnaires on a completely voluntary basis. All forms were collected anonymously.

FSFI-6

FSFI-6 is a 6-item, short and self-administered tool derived from the original 19-item FSFI that measures female sexual function [11]. It consists of six domains: desire, arousal, lubrication, orgasm, satisfaction, and pain. Desire and satisfaction are rated from 1 to 5 on a 5-point Likert-type scale, and the remaining items are rated from 0 to 5 on a 6-point Likert-type scale. The total possible score ranges from 2 to 30, and a lower score indicates poor sexual function.

Statistical analysis

Descriptive statistics were collated on respondent demographic characteristics. The median and range of respondent age were also calculated. The reliability of FSFI-6-T was determined with the internal consistency coefficient (ICC) and Cronbach's alpha, and was analyzed for each domain and for the entire scale. Cronbach's alpha was calculated for the total sample and the subsamples categorized by climacturia status. Test-retest reliability was assessed by calculating the intraclass correlation coefficient (ICC) of results from nine respondents.

Intercorrelations between total and domain scores were also calculated using Pearson's *r*. To measure discriminant validity, FSFI-6-T scores of coital incontinence (+) and coital incontinence (−) groups were compared using the *t* test. All reported *P* values are two-tailed. All data analyses were conducted using SPSS version 21.0.

RESULTS

A total of 120 patients were included in the study. All the patients participating in the study stated that they were sexually active in the last six months. A total of nine of the patients are in the postmenopausal period. The mean age of the subjects was 46.58 ± 9.89 years (28–63) and the mean parity was 1.53 ± 0.67. The mean total FSFI-19 score was 21.92 ± 9.52 (1.2–34.8) while the mean total FSFI-6 score was 18.17 ± 7.91 (1–29) (Table 1). The results of the reliability analysis indicated that the intraclass correlation coefficient of the total FSFI-6 score was 0.92 (weighted kappa coefficients of individual items, 0.841–0.973) and the Cronbach's alpha was 0.862 (Table 2). The validity analysis indicated that the mean total FSFI-6 score was strongly correlated with the mean total FSFI-19 score ($p < 0.001$, $r = 0.997$). In the test-retest analysis, the kappa coefficient was calculated as 0.891. An FSFI-6 score of 19 was accepted as the cut-off value for FSD, and as per this definition, 62 subjects had FSD. This number was 58 according to the FSFI-19 questionnaire. The agreement between FSFI-6 and FSFI-19 in determining FSD was 90%.

There was no significant difference in BMI between the groups with and without climacturia. The FSFI-19 and FSFI-6 scores of the patients with ($n = 52$) and without climacturia ($n = 68$) were compared, and it was observed that the scores of the patients with climacturia were significantly lower than those without climacturia ($p < 0.001$) (Table 3).

When analysed according to comorbidities, 26 of the patients had hypertension and 24 had Diabetes Mellitus (DM). FSFI-6 and FSFI-19 scores of patients with hypertension and DM were lower than patients without comorbidity (Table 4). FSFI-6 and FSFI-19 scores in premenopausal women ($n = 51$) were 19.89 ± 6.44 and 23.42 ± 7.94, respectively. These scores were found to be significantly lower in postmenopausal women (13.00 ± 9.75 and 14.5010.96, respectively, $p < 0.001$).

DISCUSSION

In this study, we analyzed the validity and reliability of the Turkish version of the FSFI-6 questionnaire, a well-validated tool for the rapid and accurate screening of FSD in clinical practice. The abridged version of FSFI-19 was found to be in high agreement with the original long form. Also, FSD was found to be more

Table 1. Characteristics of patients.

	Mean ± SD	Min–Max
Age	46.58 ± 9.89	28–63
BMI	27.64 ± 5.87	20.83–36.57
Parity	1.53 ± 0.67	0–5
OABSS	4.53 ± 3.21	1–14
FSFI-Desire	3.85 ± 1.34	0–6
FSFI-Arousal	3.55 ± 1.70	0–6
FSFI-Lubrication	3.92 ± 1.82	0–6
FSFI-Orgasm	1.77 ± 1.57	0–5.6
FSFI-Satisfaction	3.27 ± 1.63	0–5.6
FSFI-Pain	3.83 ± 1.87	0–6
FSFI-Total	21.92 ± 9.52	1.2–34.8
FSFI-6	18.17 ± 7.91	1–29

BMI body mass index, *OABSS* overactive bladder symptom score, *FSFI* female sexual function index.

Table 2. The six-item female sexual function index: total and each domain scores.

	Mean ± SD	ICC
FSFI-1	3.17 ± 1.08	0.860
FSFI-2	2.92 ± 1.45	0.973
FSFI-3	3.42 ± 1.62	0.899
FSFI-4	2.50 ± 1.46	0.852
FSFI-5	2.67 ± 1.45	0.900
FSFI-6	3.50 ± 1.51	0.841

Cronbach Alpha: 0.862.
FSFI female sexual function index, *ICC* intraclass correlation coefficient.

Table 3. Comparison of the sexual functions of the climacturia (+) and climacturia (−) patients.

	Climacturia (+) ($n = 52$)	Climacturia (−) ($n = 68$)	p
FSFI-19	16.27 ± 9.43	25.80 ± 7.07	<0.001
FSFI-6	14.10 ± 8.07	21.97 ± 5.60	<0.001

Independent sample *t* test was used.
FSFI female sexual fuction index.

Table 4. FSFI scores according to co-morbidity status.

	Hypertension ($n = 13$)	Diabetes Mellitus ($n = 12$)	No co-morbidity ($n = 35$)	p
Age	51.77 ± 1.92	56.00 ± 6.45	41.43 ± 9.27	<0.001
BMI	28.57 ± 2.53	31.42 ± 3.96	26.00 ± 6.66	0.016
FSFI-6	14.23 ± 5.60	8.33 ± 6.83	23.00 ± 4.27	<0.001
FSFI-19	16.58 ± 6.76	9.20 ± 7.38	27.01 ± 5.46	<0.001

ANOVA test was used.
BMI body mass index, *FSFI* female sexual function index.

common in women with climacturia. The Turkish version of FSFI-6 had a very high internal consistency ($\alpha = 0.862$). All inter-item correlations and corrected item-total correlations were also within an acceptable range, supporting good internal consistency. Our results were comparable to the internal consistency results reported for versions of FSFI-6 in other languages (0.789–0.91).

Given that psychometric tests and that paper-and-pencil assessment tools are time-consuming, FSD assessment is often omitted in clinical practice. Besides, women may hesitate to share their sexual complaints because they are concerned about their doctor's interest in FSD. A significant number of women experience problems concerning desire, arousal, lubrication, orgasm, and satisfaction, and sexual dysfunctions including dyspareunia and vaginismus during sexual intercourse [24, 25]. These symptoms may affect women's quality of life in the form of psychological distress and altered self-perception [26].

FSFI is too long for routine clinical patient evaluation and is commonly omitted. The 5-item short form of the International Index of Erectile Function questionnaire used in men reduces this time and allows a faster recognition of the problem without compromising reliability [12].

Isidori et al. demonstrated that the cut-off value of FSFI-6 was 19. This cut-off value was highly sensitive and specific and had high positive and negative predictive values for identifying Italian women with FSD [11]. The determined cut-off score of 19 provided the ideal differential diagnostic score, thus eliminating misclassification and unnecessary time-consuming additional procedures.

Coital incontinence affects not only the patients but also their partners and sexual relations. Climacturia more than double the likelihood of avoiding sexual activity due to fear of failure to satisfy the partner, low orgasm sensation, rare relationship, and fear of failure [14]. In our study, it was observed that women with climacturia are more susceptible to FSD. The FSFI-6 questionnaire, which can be answered in a short time instead of spending a long time to understand this situation, was useful.

Our approach has several limitations. FSFI-6 handles female sexual function as a largely one-dimensional concept rather than dividing it into six domains. This means that women who score below the specified cut-off score in FSFI-6 may still need further evaluation. In such cases, FSD should be confirmed with the long version of FSFI or other inventories, a more detailed assessment, a comprehensive medical history, physical examination and laboratory and instrumental testing (for every patient). Not using the Female sexual distress scale for the assessment of sexual distress is an important limitation. The patients were not examined and differentiated in terms of overactive bladder.

Orgasmometer-F is an interrogation tool that evaluates orgasm intensity in women. Orgasmometer is as important as FSFI in the evaluation of these patients. The tool, consisting of a single question and measuring orgasm intensity with a score of 0–10, was developed by Mollaioli et al. [27]. We did not use this tool in our study due to the lack of linguistic validation yet.

CONCLUSION

Our results demonstrate that FSFI-6 is a reliable tool that offers a practical approach for preliminary clinical diagnosis, especially in non-specialist clinical settings. FSFI-6 may also be useful in evaluating treatment response, but further validation is required for this specific purpose.

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AUTHOR CONTRIBUTIONS

AES: Project development, data collection, paper writing. MGC: Project development, paper writing. EJ: Supervisor.

COMPETING INTERESTS

The authors declare no competing interests.

ADDITIONAL INFORMATION

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