ORIGINAL RESEARCH—WOMEN'S SEXUAL HEALTH

The Female Sexual Function Index (FSFI): Translation, Validation, and Cross-Cultural Adaptation of an Urdu Version "FSFI–U"

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ABSTRACT

Introduction. Female sexual dysfunction (FSD) is a common problem, and many self-report questionnaires are available for its evaluation. Pakistani women with sexual problems feel shy to consult with their physician. A validated self-report questionnaire, in the local language with modest expressions is required for these women.

Aim. The aim of this study was to translate, cross-culturally adapt, and perform a psychometric validation of an Urdu translation of the Female Sexual Function Index (FSFI).

Methods. The FSFI was translated in Urdu, and its precision was ascertained through reverse translation. It was pretested on 22 bilingual women and refined again to reach at a reliable Urdu version of the questionnaire FSFI-U. One hundred sixteen bilingual women, in a stable sexual relationship over the previous 6 months were finally asked to fill out the FSFI and FSFI-U. Their sexual function was then clinically evaluated and responses were compared with the clinical assessment as well as with each other.

Main Outcome Measures. The responses were analyzed through descriptive statistics for reliability, face validity, agreement between the responses to the original English version and to the FSFI-U, and also for test–retest consistency. The data were analyzed statistically using Cronbach's alpha analysis, Intraclass correlation coefficients, Pearson correlation, and Student's *t*-test.

Results. FSFI was found to be easily understandable and capable of adequately evaluating and measuring various aspects of female sexual function. A high degree of internal consistency was demonstrated on Cronbach's alpha analysis. Cronbach's α coefficient for various domains was sufficiently high ranging from 0.84 to 0.97. The clinical assessment of the presence and severity of FSD also matched with the self-report questionnaire. Similarly, various domains of FSFI had high degree of correlation in the Urdu version of FSFI ($P < 0.001$).

Conclusion. The Urdu translation version of FSFI is valid and reliable for use in the literate population of Pakistan. **Rehman KU, Asif Mahmood M, Sheikh SS, Sultan T, Khan MA. The Female Sexual Function Index (FSFI): Translation, Validation, and Cross-Cultural Adaptation of an Urdu Version "FSFI–U". Sex Med 2015;3:244–250.**

Key Words. Female Sexual Function Index; Translation; Validation; Questionnaire; Urdu; Adaptation; Female Sexual Function

Introduction

Female sexual dysfunction (FSD) is a common disorder. Around 43% of American women have been found to suffer from FSD [1]. A multi-center, multination study of Asian women revealed sexual problems in the range of 20–25%. It further showed a high rate of hesitancy in seeking help because of economic and sociocultural considerations [2]. Numerous studies from diverse geo-

graphic and sociocultural backgrounds have suggested similar problems globally [1,3–8].

FSD is a multifaceted problem. Because of this reason, the diagnostic instruments for FSD and the definition of FSD evolved gradually over years [9,10]. Many structured self-report and semistructured questionnaires have been developed for the evaluation of FSD, and some have been thoroughly tested for psychometric validity, like the Changes in Sexual Functioning Questionnaire [11], Brief Index of Sexual Functioning for Women [12], the Derogatis Interview for Sexual Functioning [13], the Golombok Rust Inventory of Sexual Satisfaction [14], and the Female Sexual Function Index (FSFI) [9]. Some other questionnaires have also been developed, but have not been validated so extensively [15,16].

FSFI was developed and meticulously validated in the year 2000 [8,9], which was cross-validated again in women with mixed sexual disorders [17]. This questionnaire has been successfully translated and psychometrically validated in other languages, including Chinese, Arabic, Persian, Malay, Turkish, Korean, and Japanese [18–23]. It has also been used to evaluate sexual problems in adolescence, pregnancy, middle and menopausal ages [5,6,24,25]. It has been used to evaluate sexual problems in various clinical conditions, like women with diabetes mellitus, hypertension, female genital mutilation, obstructive sleep apnea, medical tinnitus, spinal cord injury, pelvic surgery, elective aortic surgery, and women from a medical clinic [7,26–34].

No scientific study has been conducted in Pakistan to assess prevalence of FSD, but physicians, gynecologists, and andrologists with interest in sexual medicine estimate the incidence, patterns, and behavior of Pakistani women as almost similar to what has been reported from other parts of the world, especially the Asian populations. No self-report questionnaire or any other diagnostic instrument for FSD is available in local language, of our region and there is a need for an Urdu version of a well-validated instrument in this regard. We reviewed all the validated questionnaires and found FSFI to be the most appropriate for our population, due to its explicit yet modest expressions that suit well to our conservative society.

Aims

To translate, adapt cross-culturally, and perform psychometric validation of the FSFI into Urdu language as "FSFI-U".

Methods

Translation of FSFI into Urdu (FSFI-U)

The original FSFI was translated in Urdu language by a physician (one of the authors, a renowned literary translator) who is fluent in English as well as Urdu. He has already translated the validated and published Urdu version of the Five-Item International Index of Erectile Function [35]. The FSFI-U was reverse translated a few times to get at a reliable translation. This translation was further reviewed by a three-member expert committee; a psychologist, an andrologist and a gynecologist for refinement. The final approved version was then pretested in a pilot study on 22 bilingual women, who were in a stable sexual relationship over the past 6 months. The pretest showed this translation to be very appropriate. The final Urdu version of FSFI, which has been referred to as FSFI-U is the subject of discussion in this article.

Subjects and Data Collection

One hundred sixteen consecutive consenting bilingually educated (Urdu and English) women who have been in a stable sexual relationship for at least 6 months were recruited from the psychology clinic. These women were 19 years and older in age, married, and at least graduate by education. Patients with any other illness were excluded from the study.

The participants responded initially to the original FSFI (English) [9] and then the Urdu version (FSFI-U) in the same session. Each respondent was then interviewed by the female psychologist for clinical assessment of their sexual function, which was then matched with their responses to the two versions of the questionnaire.

Test–retest Reliability

Twenty-two participants were asked to re-answer the questionnaires after 2 weeks in order to evaluate the test–retest validity of questionnaire.

Main Outcome Measure

The responses of the participants were analyzed for reliability, face validity, agreement between the responses to original English version and to the FSFI-U, and for test–retest correlations using the Statistical Package for the Social Sciences (SPSS) version 17 (SPSS, Inc., Chicago, IL, USA).

Table 1 Summary statistics of the six domains and total scores obtained in the enrolled women (n = 116)

	Total score	Desire	Arousal	Lubrication	Orgasm	Satisfaction	Pain
Mean ± SD	64.53 ± 18.68	3.88 ± 1.45	3.99 ± 1.52	4.08 ± 1.43	4.02 ± 1.46	3.83 ± 1.61	4.61 ± 1.44

SD = standard deviation.

Reliability

Mean values of total and domain scores of the FSFI-U as well as their Cronbach's α coefficients were determined to assess its internal consistency reliability.

Face Validity

In terms of face validity, exploratory factor analysis (maximum likelihood method, promax rotation) was applied.

Agreement between the English and Urdu Version

Agreement between responses of the same participant to the original English and the Urdu version (FSFI-U) were analyzed using Kappa statistics.

Test–Retest Reliability

Finally the test–retest correlations were evaluated by applying intraclass correlation coefficient (ICC) to individual domains as well as to the full scale of

FSFI-U. Paired sample *t*-test was also applied to the mean scores of each domain and full scale of responses to both versions of the questionnaire.

Results

The study included 116 married and educated women. Fifty percent (58) women were between 20 and 29 years, 44% (51) 30 and 39 years, and 6% (5) over 40 years old. The total FSFI domain scores obtained by the enrolled women are presented in Table 1.

Reliability

Cronbach's α coefficients were determined for total and domain scores, of FSFI-U, which were significantly high, ranging from 0.841 to 0.970 for the entire sample of 116 participants, indicating that FSFI-U has good internal consistency reliability. Individual domain scores were calculated

Table 2 Mean values and Cronbach's α coefficient of the Female Sexual Function Index-Urdu version (n = 116)

Domain name (multiplying factor)	Score range	Mean ± SD	Cronbach's alpha	Number of items
Desire (0.6)	1.2–6*	3.88 ± 1.45	0.956	2
1. Frequency	1.0–5.0	3.29 ± 1.26		
2. Level	1.0–5.0	3.18 ± 1.21		
Arousal (0.3)	0–6*	3.99 ± 1.52	0.970	4
3. Frequency	0.0–5.0	3.24 ± 1.36		
4. Level	0.0–5.0	3.25 ± 1.34		
5. Confidence	0.0–5.0	3.37 ± 1.28		
6. Satisfaction	0.0–5.0	3.42 ± 1.32		
Lubrication (0.3)	0–6*	4.08 ± 1.43	0.890	4
7. Frequency	0.0–5.0	3.35 ± 1.31		
8. Difficulty	0.0–5.0	3.55 ± 1.39		
9. Frequency of maintaining	0.0–5.0	3.20 ± 1.35		
10. Difficulty in maintaining	0.0–5.0	3.50 ± 1.45		
Orgasm (0.4)	0–6*	4.02 ± 1.46	0.841	3
11. Frequency	0.0–5.0	3.25 ± 1.35		
12. Difficulty	0.0–5.0	3.52 ± 1.44		
13. Satisfaction	0.0–5.0	3.28 ± 1.39		
Satisfaction (0.4)	1.2–6*	3.83 ± 1.61	0.963	3
14. With closeness with partner	1.0–5.0	3.16 ± 1.44		
15. With sexual relationship	1.0–5.0	3.21 ± 1.37		
16. With overall sex life	1.0–5.0	3.22 ± 1.37		
Pain (0.4)	0–6.0*	4.61 ± 1.44	0.966	3
17. Frequency during vaginal penetration	0.0–5.0	3.81 ± 1.25		
18. Frequency following vaginal penetration	0.0–5.0	3.84 ± 1.26		
19. Level during or following vaginal penetration	0.0–5.0	3.88 ± 1.22		
Full-scale score	5.2–36.0†	24.42 ± 6.97	0.953	19

*The individual domain scores were calculated by adding the scores of the individual items that comprise the domain and multiplying the sum by domain factor.
†The full-scale score is calculated by adding the six domain scores.
SD = standard deviation.

Table 3   Factor analysis of the Female Sexual Function Index (FSFI)-Urdu version: construct validity (n = 116)

	Factors				
	F1	F2	F3	F4	F5
Desires					
Frequency	**0.916***	0.210	0.071	0.135	−0.091
Level	**0.931***	0.150	0.134	0.140	−0.062
Arousal					
Frequency	**0.934***	0.155	0.119	0.171	0.087
Level	**0.928***	0.173	0.078	0.157	0.043
Confidence	**0.845***	0.254	0.118	0.217	0.133
Satisfaction	**0.861***	0.316	0.116	0.230	0.068
Lubrication					
Frequency	**0.890***	0.231	0.133	0.224	0.125
Difficulty	0.441	0.205	0.172	**0.798***	−0.084
Frequency of maintaining	**0.702***	0.307	0.060	0.325	0.464
Difficulty in maintaining	0.221	0.320	0.110	**0.886***	0.107
Orgasm					
Frequency	**0.717***	0.317	0.130	0.259	0.479
Difficulty	0.214	0.342	0.086	**0.874***	0.124
Satisfaction	**0.513***	**0.622***	0.081	0.282	0.257
Satisfaction					
With closeness with partner	0.340	**0.825***	−0.047	0.331	0.142
With sexual relationship	0.269	**0.896***	−0.187	0.227	−0.002
With overall sex life	0.250	**0.878***	−0.186	0.245	−0.016
Pain					
Frequency during vaginal penetration	0.114	−0.079	**0.944***	0.117	−0.031
Frequency following vaginal penetration	0.166	−0.102	**0.951***	0.073	0.008
Level during or following vaginal penetration	0.132	−0.078	**0.952***	0.072	0.079
Eigenvalue	**70.556**	**30.457**	**20.939**	**20.926**	**0.633**
Percentage of explained variance	39.770	18.196	15.468	15.399	3.331

Extraction method: principal component analysis. Rotation method: varimax with Kaiser normalization.
*The highest factor loading in each principal component are shown in bold. All factor loadings in F5 < 0.5. Kaiser–Meyer–Olkin measure of sampling adequacy = 0.891, which is > 0.8. Furthermore, Bartlett test of sphericity (χ^2 = 3429.21, d = 171, $P < 0.001$) was calculated. Desire: F1; Arousal: F2; Lubrication: F1, F4; Orgasm: F1, F2, F4 (F1, F2 overall satisfaction); Satisfaction: F2l; and Pain: F3.

by adding the scores of the individual items that comprise the domain and multiplying the sum by domain factor. The full-scale score was calculated by adding the six domain scores (Table 2).

Face Validity

The 19 items of FSFI-U were assigned to five factors that corresponded to domains of female sexual function: Desire, arousal, lubrication, orgasm, satisfaction and pain with eigenvalues 7. 556, 3.457, 2.939, 2.926 and .633 respectively. These five factors accounted for 92.164% of the explained variance and the lowest

eigenvalue was 0.633. Factor 5 had factor loading less than 0.5 (Table 3).

Agreement between English and Urdu Version

Kappa statistics was applied to analyze the agreement between Urdu and original English versions. Both were found to be in perfect agreement ($P < 0.001$).

Concurrent Validity for all the domains and full scale inter-correlations of FSFI-U had significant correlation ($P = < 0.05$), except for the "pain" domain, which was negatively associated with "satisfaction" ($r = -0.151$ for FSFI-U) (Table 4).

Table 4   Domain inter-correlations of the Urdu questionnaire (Pearson's *r*, n = 116)

	Desire	Arousal	Lubrication	Orgasm	Satisfaction	Pain	Full scale
Desire	1.0	—	—	—	—	—	—
Arousal	0.936†	1.0	—	—	—	—	—
Lubrication	0.745†	0.826†	1.0	—	—	—	—
Orgasm	0.682†	0.771†	0.910†	1.0	—	—	—
Satisfaction	0.465†	0.531†	0.642†	0.738†	1.0	—	—
Pain	0.232*	0.241†	0.261†	0.197*	−0.151†	1.0	—
Full scale	0.863†	0.916†	0.933†	0.917†	0.698†	0.368†	1.0

*Correlation is significant at 0.05 level (one-tailed).
†Correlation is significant at 0.01 level (one-tailed).

Table 5 Test–retest reliability of the Female Sexual Function Index-Urdu version ICC (n = 20)

Domain	Phase	Mean	SD	ICC	P value
Desire	Test	4.71	1.35	0.995**	<0.001
	Retest	4.74	1.36		
Arousal	Test	4.68	1.40	0.995**	<0.001
	Retest	4.71	1.41		
Lubrication	Test	4.53	1.31	0.990**	<0.001
	Retest	4.61	1.24		
Orgasm	Test	4.70	1.28	0.978**	<0.001
	Retest	4.76	1.25		
Satisfaction	Test	4.74	1.38	.992**	<0.001
	Retest	4.78	1.35		
Pain	Test	5.285	0.966	0.998**	<0.001
	Pain	5.310	0.974		
Total scale	Test	28.62	7.32	0.992**	<0.001
	Retest	28.65	7.40		

ICC = intraclass correlation coefficient; SD = standard deviation.
**Highly significant.

Test–Retest Reliability

The test–retest reliability was calculated for Urdu version of FSFI using ICC, which showed significant correlation between domains and full-scale scores ($P < 0.05$), (Table 5), and a paired t-test demonstrated no significant differences between the scores of two visits in the total FSFI-U or any of the six domains ($P > 0.05$) (Table 6).

Discussion

Translation, cross-cultural adaptation and psychometric validation of a self-report questionnaire have multiple challenges. Some of these challenges are common to all cultural units, while others are unique to a particular cultural unit. The common challenges include development of a translated version with expressions and phrases, comprehensible for the average person, culturally appropriate, and still close to the original version. Once this has been achieved, the next step is a systematic

testing of this questionnaire in an appropriately designed study and evaluating its psychometric properties through standard statistical analysis of the data. Another challenge is to scientifically establish that the adapted version is comparable with the original version, so that data from different cultural units can be compared at a global level. Most studies [18–23], conducted for cross-cultural adaptation of the original FSFI [9], have not addressed this part of the challenge. The present study has been undertaken in a systematic way to develop a cross-culturally adopted translation of the original English version of FSFI [9], and to validate its responses for comprehensiveness and psychometric acceptability. We included respondents well versed in both English and Urdu, and compared their responses to questionnaires, in both languages, for agreement, using Kappa statistics and a perfect agreement was found ($P < 0.0001$). Pearson's r-test was used to analyze the domain as well as full-scale correlations of FSFI-U, which showed good correlations ($P < 0.05$). On test–retest reliability, patients demonstrated significant correlation between the two responses 2 weeks apart.

Up until now in our region, we have no validated instrument in Urdu to differentiate between cases and controls of FSD, and our subjects are often reluctant to disclose their private views. They are also unaware of their sexual needs and problems. In order to avoid this confusion we have enrolled subjects without any sexual complaints, and evaluated them for presence or absence of FSD. This method has been adopted in other cross-cultural validation studies for questionnaires [22,23]. Current literature reveals inconsistent findings regarding factor solution for FSFI. Although most studies have used five factors, a Chinese study has recommended six-factor solu-

Table 6 Test–retest mean scores and paired sample *t*-test (n = 20)

	Mean difference							
				95% confidence interval of the difference				
	Test mean (SD) n = 20	Retest mean (SD) n = 20	Mean difference (SD)	Lower	Upper	t	df	P value
Desire	4.710 (1.353)	4.740 (1.361)	–0.030 (0.134)	–0.093	0.033	–1.000	19	0.330
Arousal	40.680 (1.398)	4.710 (1.407)	–0.030 (0.134)	–0.093	0.033	–1.000	19	0.330
Lubrication	4.530 (1.313)	4.610 (1.237)	–0.080 (0.199)	–0.173	0.013	–1.798	19	0.088
Orgasm	4.700 (1.277)	4.760 (1.251)	–0.060 (0.268)	–0.186	0.066	–1.000	19	0.330
Satisfaction	4.740 (1.375)	4.780 (1.352)	–0.040 (0.179)	–0.124	0.044	–1.000	19	0.330
Pain	5.285 (0.966)	5.310 (0.974)	–0.025 (0.064)	–0.055	0.005	–1.751	19	0.096
Full scale	28.620 (7.323)	28.650 (7.403)	–0.030 (0.961)	–0.480	0.420	–140	19	0.890

df = degrees of freedom; SD = standard deviation.

tion as compared with five factors [18]. We have determined factorial analysis using five factors (Table 3).

In spite of good educational background, women in our study group (89%) were initially reluctant at filling questionnaires by saying that they had no problems. Our counseling facilitated them in reporting their problems and finally, we were able to control the issue of dropouts. It was observed that the participants, especially younger women were insecure to discuss their problem because of fear of confidentiality (89%), which resolved after counseling. Most women (52%) were completely unaware of the concepts of sexual arousal and lubrication. They also reported lack of interest in sexual activity. Majority of women (72%) were of the impression that their partners did not want them to be sexually expressive and demanding. This peculiar cultural and linguistic pattern may have affected the understanding of concepts and questions of FSFI. This may have lead to some disparities of factor structure in our study (Table 3). Further studies are required to investigate the nature of this disparity.

All participants in the study were postgraduate, which signifies a high degree of education and comprehension. A study on women with lesser education may be further required to ascertain any differences.

We have generated a psychometrically valid Urdu version of FSFI that is linguistically equivalent to the original English version. Data generated through FSFI-U were comparable with the data generated through the original English version. We hope that FSFI-U would open a door toward understanding this clinical problem and facilitate in talking to our shy women about the issue. We hope that this will break the wall of silence between our patients and us and will enable us to generate internationally comparable data from our region.

Conclusion

This study has inferred that FSFI-U is a psychometrically valid instrument to evaluate the multifaceted problems of sexuality in literate Pakistani women. FSFI-U has also been shown to be equivalent to the original English version of FSFI, and can hence be used for research in our region.

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Supporting information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Appendix S1. Urdu version (FSFI-U) of Female Sexual Function Index (FSFI).