



Published in final edited form as:

*J Sex Marital Ther.* 2003 ; 29(1): 39–46.

## Validation of the Female Sexual Function Index (FSFI) in Women with Female Orgasmic Disorder and in Women with Hypoactive Sexual Desire Disorder

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### Abstract

The Female Sexual Functioning Index (FSFI; Rosen et al., 2000) is a self-report measure of sexual functioning that has been validated on a clinically diagnosed sample of women with female sexual arousal disorder. The present investigation extended the validation of the FSFI to include women with a primary clinical diagnosis of female orgasmic disorder (FOD;  $n = 71$ ) or hypoactive sexual desire disorder (HSDD;  $n = 44$ ). Internal consistency and divergent validity of the FSFI were within the acceptable range for these populations of women. Significant differences between women with FOD and controls and between women with HSDD and controls were noted for each of the FSFI domain and total scores.

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Research on female sexual dysfunction has rapidly advanced over the past few years. This has brought to light the need for psychometrically sound instruments for diagnosing female sexual dysfunction and for effectively monitoring treatment-induced changes. What defines a psychometrically sound instrument is the extent to which it meets standards of reliability and validity. Reliability encompasses the degree to which the instrument yields measures that are stable across time (test-retest reliability) and is comprised of homogeneous items (internal consistency) and, in the case of clinician-administered inventories, consistency between raters (interrater reliability). Although reliability refers to the consistency of measurement, test validity reflects the degree to which the instrument measures what it purports to measure. To this end, validity encompasses such issues as are the test items appropriate and complete, do the test scores relate to other measures of the same domain (concurrent validity), can the test differentiate between functional and dysfunctional samples (discriminant validity), and how are the scores associated with those from a related but different domain (divergent validity).

In a recent review of validated instruments for assessing female sexual function, Meston and Derogatis (2002) highlighted a number of inventories for which internal consistency and test-retest reliabilities have been established and been demonstrated to fall within the acceptable range. Of these, the Female Sexual Function Index (FSFI; Rosen et al., 2000) was the only published instrument validated and normed on a sample of women with clinically diagnosed female sexual dysfunction. The FSFI has been shown to discriminate reliably between women with and without female sexual arousal disorder (FSAD) on each of five domains: desire, arousal, lubrication, orgasm, satisfaction, and pain. As noted in the U.S. Food and Drug Administration (2000) guidelines for industry regarding the development of pharmacological treatments for female sexual dysfunction, a questionnaire's sensitivity to differentiating

between women with and without specific sexual difficulties is an essential requirement for its use as a diagnostic instrument.

As noted above, the FSFI was normed and validated on a sample of women with clinically diagnosed FSAD. The primary purpose of the present investigation was to extend the FSFI validation to include women with a primary clinical diagnosis of inhibited female orgasm disorder (FOD) or hypoactive sexual desire disorder (HSDD). Ascertaining whether the FSFI is sensitive to detecting differences between women with and without FOD or HSDD will determine its usefulness as a diagnostic tool for these populations.

## METHODS

### Subjects

Participants were recruited via local radio and newspaper advertisements and were paid \$50.00 for their participation. Inclusion criteria were that the women had to be between 18 and 70 years of age and currently involved in a stable, sexually active relationship. Seventy-one women met *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR; American Psychiatric Association, 2000) criteria for FOD. Of these, 32 (45%) also met criteria for FSAD, and 29 (41%) also met DSM-IV-TR criteria for HSDD. Thirteen (18%) of the women with FOD were diagnosed with both FSAD and HSDD. In total, 44 women met DSM-IV-TR criteria for HSDD. Of these, 19 (43%) also met criteria for FSAD, and 29 (66%) also met criteria for FOD. Thirteen (30%) of the women with HSDD were diagnosed with both FSAD and FOD. Three of the women with FOD also met criteria for dyspareunia or vaginismus. The high co-existence of sexual disorders among women in this study is consistent with previous literature (e.g., Segraves & Segraves, 1991). The control sample was age-matched  $\pm 2$  years with the FOD and HSDD women. Control participants did not meet DSM-IV-TR criteria for any of the following: HSDD, FSAD, FOD, dyspareunia, vaginismus, or sexual anxiety disorder. The study participant characteristics are listed in Table 1. There were no significant age differences between FOD and control women,  $t(140) = -.11, p = 0.91$ , or between HSDD and control women,  $t(86) = -1.12, p = 0.27$ .

### Measures

**FSFI**—The FSFI (Rosen et al., 2000) is a brief, 19-item self-report measure of female sexual function that provides scores on six domains of sexual function as well as a total score. Researchers have confirmed the domains I am assessing in this study using factor analyses. They include: desire (2 items), arousal (4 items), lubrication (4 items), orgasm (3 items), satisfaction (3 items), and pain (3 items). The FSFI was developed on a female sample of 131 normal controls (age range, 21–68) and 128 age-matched subjects (age range, 21–69) who met DSM-IV-TR criteria for FSAD. The FSFI has been shown to reliably discriminate FSAD and control patients on each of the six domains of sexual function as well as on the full scale score. Internal consistency and test-retest reliabilities are within the acceptable range. Divergent validity has been established using the Locke-Wallace Marital Adjustment Test (Locke & Wallace, 1959). Correlations between the FSFI and Locke-Wallace were generally modest in magnitude (.53, .22 for control and FSAD groups, respectively), with the strongest relation observed for the satisfaction domain of The FSFI. The FSFI takes approximately 15 min to administer and may be accessed on the web at [www.fsf-questionnaire.com](http://www.fsf-questionnaire.com).

**LOCKE-WALLACE MARITAL ADJUSTMENT TEST**—The Locke-Wallace Marital Adjustment Test (Locke & Wallace, 1959) is a 15-item self-report measure of marital satisfaction or quality and agreement or disagreement on a number of issues (finances, recreation, affection, friends, sex, conventionality, conflict resolution, and confiding). Internal consistency coefficients ranged from .63 to .87 for women, and test-retest reliability measured

over a 1-month interval was .84 for women (Freeston & Plechaty, 1997). The Locke-Wallace Marital Adjustment Test has been shown to reliably discriminate between maritally satisfied and dissatisfied women in both analysis of variance and classification tests (Freeston & Plechaty, 1997).

### Procedure

The study was conducted in the Female Sexual Psychophysiology Laboratory at the University of Texas at Austin. A trained female clinician interviewed participants to determine whether or not they met DSM-IV-TR criteria for any of the following: FOD, HSDD, FSAD, dyspareunia, vaginismus, or sexual anxiety disorder. Following the DSM-IV-TR interview, participants filled out a demographics questionnaire, the FSFI, the Locke-Wallace Marital Adjustment Test, and a number of sexuality questionnaires not relevant to the present study. Participants completed the questionnaires alone in a private room.

## RESULTS

### Reliability

I determined internal consistency using Cronbach's alpha for each of the six FSFI domains and the total FSFI score separately for women with FOD, HSDD, and controls (see Table 2). High inter-item correlations were noted for all of the domain scores among women with FOD (.84 and higher), control women (.83 and higher), and women with HSDD (.74 and higher), with the exception of the desire composite, which had a moderate alpha value of .58 among women with HSDD. High inter-item correlations were noted for FSFI total scores among women with FOD, women with HSDD, and controls.

### Discriminant Validity

I assessed the ability of the FSFI to differentiate between clinical and nonclinical samples by comparing the mean responses of women with FOD ( $N = 71$ ) with those of the age-matched control women ( $N = 71$ ) and by comparing the mean responses of women with HSDD ( $N = 44$ ) with those of age-matched controls ( $N = 44$ ). The results from between groups analyses of variance revealed significant differences between women with FOD and controls and between women with HSDD and controls on each of the FSFI domain and total scores. Because of the coexistence of FOD and HSDD among many of the participants, comparisons between women with FOD and HSDD were not statistically or theoretically feasible. Means ( $\pm$  SDs) for each of the FSFI items, domains, and total scores by subject group are presented in Table 3.

### Divergent Validity

To assess the degree of association between the FSFI and a different but related construct (marital satisfaction), I calculated Pearson product-moment correlations between the FSFI domain and total scores and the Locke-Wallace Marital Adjustment Test score. Correlations were conducted on 32 control women, 39 women with FOD, and 25 women with HSDD for whom data were available on every item of the Locke-Wallace Marital Adjustment Test. Among women with FOD and HSDD, the only significant correlations were for the satisfaction domain of the FSFI. Among control women, significant correlations were observed for the satisfaction domain as well as for the total FSFI score (see Table 4).

## DISCUSSION

The FSFI was developed for assessing women clinically diagnosed with FSAD. The present study examined the reliability and validity of the FSFI for use among women with a primary clinical diagnosis of FOD or HSDD. Inter-item correlations of .83 and higher were observed

for all of the domain scores among women with FOD and for control women. These high correlations are comparable to those reported by Rosen et al. (2000) for women with FSAD (.82 and higher) and for control women (.89 and higher). Among women with HSDD, internal consistency was in the acceptable range for all of the domains (.74 and higher), with the exception of the desire composite. The moderate alpha value of .58 suggests that the two-item FSFI desire composite may not be a reliable indicator of sexual desire among this population.

Correlations between the Locke-Wallace Marital Adjustment Test and FSFI domains scores were modest in magnitude for women with FOD, for women with HSDD, and for controls. Correlations with the total FSFI scores were in the low moderate range for the control women ( $r = .52$ ) and were very low for women with FOD ( $r = .22$ ) and with HSDD ( $r = .16$ ). These correlations are almost identical to those reported by Rosen et al. (2000) for women with FSAD ( $r = .22$ ) and for controls ( $r = .53$ ). Also consistent with that reported by Rosen et al. (2000), the satisfaction domain showed the strongest association with marital adjustment for each of the participant groups. Lowest marital adjustment associations were with the FSFI pain domain for women with FOD and for controls and with the orgasm and lubrication domains for women with HSDD. The statistical dissociation between FSFI scores and the related construct of marital adjustment lends support for the construct validity of the FSFI among these groups of women.

Significant differences between women with FOD and controls and between women with HSDD and controls were noted for each of the FSFI domains and for the total scores. As one might have expected, the largest differences between women with FOD and controls were noted for the domains of orgasm and arousal (effect sizes estimated using Cohen's  $D = 1.69$ ,  $1.58$ , respectively), and the largest differences between women with HSDD and controls were seen for the domains of arousal and desire (effect sizes estimated using Cohen's  $D = 1.85$ ,  $1.69$ , respectively). The ability of the FSFI to differentiate between clinical and nonclinical groups of women lends support for the discriminant validity of the FSFI among these groups of women.

In conclusion, the findings from this study indicate that the FSFI is a reliable and valid measure of sexual functioning for women with FOD and HSDD. This is the first study to validate a measure of sexual functioning on a sample of women with a primary clinical diagnosis of FOD and on a sample of women with a primary clinical diagnosis of HSDD. Future research is needed to examine the sensitivity of the FSFI for detecting treatment-induced changes among these populations of women.

## Acknowledgments

This article was made possible by Grant Number 5 RO1 AT00224-02 from the National Center for Complementary and Alternative Medicine. Its contents are solely the responsibility of the author and do not necessarily represent the official views of the National Center for Complementary and Alternative Medicine. I would like to thank Katie McCall and Monica Calderon for their assistance in data collection.

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TABLE 1

## Participant Characteristics

	Female orgasmic disorder N = 71	Hypoactive sexual desire disorder N = 44	Controls* N = 71
Age			
Mean (+/-SD)	29.4 (8.76)	33.0 (10.42)	29.2 (7.9)
Range	18–53	18–53	18–53
Ethnicity			
Caucasian	58 (81.7)	40 (90.9)	52 (73.2)
African American		1 (2.3)	7 (9.9)
Native-American			2 (2.8)
Hispanic	10 (14.1)	3 (4.2)	8 (11.3)
Asian	3 (4.2)		1 (1.4)
Other			1 (1.4)
Education			
High school/GED	15 (21.2)	8 (18.2)	8 (11.3)
College	48 (67.6)	28 (63.6)	53 (74.7)
Graduate school	8 (11.3)	8 (18.2)	10 (14.1)
Annual Income			
<50,000	37 (52.1)	22 (50)	49 (69)
50,000–100,000	26 (36.6)	16 (36.4)	17 (24)
> 100,000	8 (11.3)	6 (13.6)	5 (7)
Marital status			
Married	18 (25.4)	16 (36.4)	13 (18.3)
Divorced	9 (12.7)	4 (9.1)	10 (14.1)
Single	44 (62.0)	24 (54.5)	48 (67.6)
Children (% yes)			
Hysterectomy (% yes)	2 (2.9)	1 (2.3)	4 (5.6)
Ovaries removed (% yes)			
Hormone replacement	2 (2.9)	1 (2.3)	3 (4.2)
Therapy (% yes)			
Antidepressant use (% yes)	6 (8.6)	1 (2.3)	3 (4.2)
Frequency of sexual activity			
<once per month	1 (1.4)	8 (18.2)	1 (1.4)
1–2 per month	11 (15.5)	26 (59.1)	8 (11.3)
1–2 per week	35 (49.3)	9 (20.5)	30 (42.3)
3–4 per week	19 (26.8)	1 (2.3)	19 (26.8)
4 per week	5 (7.0)		13 (18.3)

\* Controls were the 71 women who were age-matched (+/- 2 years) with the women with female orgasmic disorder.

**TABLE 2**

## FSFI Internal Consistency

	<b>Female orgasmic disorder</b>	<b>Hypoactive sexual desire disorder</b>	<b>Controls *</b>
FSFI domain			
Desire	0.84	0.58	0.83
Arousal	0.91	0.91	0.83
Lubrication	0.95	0.94	0.85
Orgasm	0.90	0.90	0.89
Satisfaction	0.79	0.74	0.84
Pain	0.93	0.94	0.90
All items	0.91	0.92	0.89

*Note:* Internal consistency estimated using Cronbach's alpha (range = -1.00 to +1.00).

\* Data reported here are based on the responses from the 71 control women, who were age-matched with the women with female orgasmic disorder.

TABLE 3

## FSFI Discriminant Validity

FSFI items and domains	Female orgasmic disorder <i>N</i> = 71	Hypoactive sexual desire disorder <i>N</i> = 44	Controls* <i>N</i> = 71	<i>p</i> -value
<i>Desire</i>	5.91 (2.02)	5.21 (1.42)	7.72 (1.56)	< .001 <sup>a,b</sup>
1. Desire: frequency	2.94 (1.13)	2.47 (0.80)	3.97 (.88)	
2. Desire: level	2.97 (1.05)	2.74 (0.89)	3.88 (.81)	
<i>Arousal</i>	12.73 (4.09)	12.03 (3.95)	17.59 (2.07)	< .001 <sup>a,b</sup>
3. Arousal: frequency	3.53 (1.14)	3.32 (1.06)	4.67 (.59)	
4. Arousal: level	3.19 (0.95)	3.08 (1.04)	4.17 (.72)	
5. Arousal: confidence	3.02 (1.16)	2.82 (1.14)	4.27 (.78)	
6. Arousal: satisfaction	3.00 (1.30)	2.89 (1.25)	4.48 (.71)	
<i>Lubrication</i>	14.48 (5.36)	14.58 (5.37)	18.72 (2.32)	< .001 <sup>a,b</sup>
7. Lubrication: frequency	3.49 (1.53)	3.34 (1.62)	4.80 (.54)	
8. Lubrication: difficulty	3.78 (1.33)	3.79 (1.28)	4.77 (.53)	
9. Lubrication: frequency of maintaining	3.44 (1.52)	3.55 (1.57)	4.50 (.76)	
10. Lubrication: difficulty in	3.76 (1.40)	3.89 (1.35)	4.66 (.65)	
<i>Orgasm</i>	7.29 (3.63)	8.53 (4.07)	13.03 (2.71)	< .001 <sup>a,b</sup>
11. Orgasm: frequency	2.40 (1.34)	2.84 (1.50)	4.36 (.82)	
12. Orgasm: difficulty	2.57 (1.36)	2.95 (1.51)	4.41 (.73)	
13. Orgasm: satisfaction	3.23 (1.25)	2.74 (1.45)	4.27 (1.0)	
<i>Satisfaction</i>	9.71 (3.38)	9.71 (2.98)	12.38 (2.71)	< .001 <sup>a,b</sup>
14. Satisfaction: with amount of closeness with partner	3.48 (1.41)	3.68 (1.34)	4.25 (.99)	
15. Satisfaction: with sexual relationship	3.25 (1.24)	3.24 (1.08)	4.08 (1.07)	
16. Satisfaction: with overall sex life	2.98 (1.35)	2.79 (1.23)	4.05 (1.05)	
<i>Pain</i>	13.05 (3.08)	13.00 (2.81)	14.72 (.90)	< .001 <sup>a,b</sup>
17. Pain: frequency during vaginal penetration	4.29 (1.17)	4.42 (0.89)	4.89 (.36)	
18. Pain: frequency following vaginal penetration	4.48 (1.05)	4.34 (1.02)	4.92 (.27)	
19. Pain: level during or following vaginal penetration	4.29 (1.07)	4.24 (1.05)	4.91 (.34)	
<i>Total score</i>		19.70 (4.25)		< .001 <sup>a,b</sup>

\* Data reported here are based on the responses from the 71 control women who were age-matched with the women with female orgasmic disorder.

<sup>a</sup> Significant difference between women with female orgasmic disorder (*N* = 71) and age-matched controls (*N* = 71).

<sup>b</sup> Significant difference between women with hypoactive sexual desire disorder (*N* = 44) and age-matched controls (*N* = 44).



TABLE 4

FSH Divergent Validity with the Locke-Wallace Marital Adjustment Test

	Female orgasmic disorder		Hypoactive sexual desire disorder		Controls*	
	Pearson <i>r</i>	<i>P</i> value	Pearson <i>r</i>	<i>P</i> value	Pearson <i>r</i>	<i>P</i> value
FSFI domain						
Desire	0.23	0.15	0.22	0.29	0.31	0.08
Arousal	0.22	0.19	0.16	0.47	0.34	0.06
Lubrication	-0.21	0.21	-0.10	0.63	0.24	0.18
Orgasm	0.15	0.37	0.09	0.67	0.27	0.14
Satisfaction	0.50	0.00	0.62	0.00	0.65	0.00
Pain	-0.06	0.74	-0.31	0.13	0.09	0.61
All items	0.22	0.18	0.16	0.46	0.52	0.00

\* Data reported here are based on the response from the 71 control women who were age-matched with the women with female orgasmic disorder