Female Sexual Dysfunction and its Associated Risk Factors: An Epidemiological Study in the North-East of Iran

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ARTICLE INFO

Article type: Original article

Background & aim: Female sexual function (FSD) is a multifactorial phenomenon. Sexual function is influenced by different personal and environmental factors. This study aimed to evaluate FSD and its contributing factors using female sexual function index (FSFI).

Methods: This descriptive cross-sectional study was conducted on 264 women referring to 11 health centers of Sabzevar, Iran during October 2012 to January 2013 using a convenience sampling. Data were collected using a validated Persian version of FSFI containing six domains of sexual desire, lubrication, sexual arousal, sexual satisfaction, orgasm and sexual pain as well as demographic questionnaire. A total score of <28 was defined as sexual dysfunction, and higher scores were described as satisfactory sexual function. Data analysis was performed in SPSS V.20, using Chi-square, general linear model and binary logistic regression.

Results: The mean age of women enrolled in this study was 32.2±10.27 years. Considering the cut-off point of sexual dysfunction at 28, 62.1% of the study population had FSD. Highest rate of FSD was estimated at 49.2%, Age was associated with a significant decline in total scores of FSFI (P=0.042). Moreover, a significant correlation was observed between duration of marriage and total scores of FSFI (P<0.001).

Conclusion: According to the results, sexual desire was the most frequent contributing factor among FSD domains, and the majority of women ageing 21-26 years had at least one of the risk factors of FSD. In addition, our findings indicated that despite conventional beliefs, issues such as educational level has no significant effect on FSD in young women.

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Introduction

Female sexual dysfunction (FSD) is a common multifactorial phenomenon in different populations. FSD encompasses four main phases of orgasmic disorders, sexual arousal disorders, sexual desire disorders and sexual pain disorders (1). In the United States, prevalence rate of FSD has been reported to be 43%, while it has been estimated at 5.8% in the United Kingdom (2, 3). As such, it has been proclaimed that approximately 15% of the general population in the United Kingdom suffers from lifelong sexual dysfunction (3). In a study conducted in Iran in 2006, 31.5% of the general population were reported to have FSD (4).

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Negligence or misdiagnosis of FSD could lead to critical conditions for individuals and their family members. Poor sexual health in some regions, especially those with specific cultural inclinations, may result in emotional rejection or divorce (5). According to statistics, as much as 40% of Iranian couples have extramarital affairs due to sexual dysfunction (6).

Laboratory findings on FSD are available in the literature; however, subjective data obtained from women with FSD has been shown to bear higher validity in the accurate diagnosis of FSD compared to laboratory measurements (7). The accepted gold standard for FSD diagnosis is the assessment of patients through interviews conducted by trained sexual therapists in accordance with the criteria of diagnostic and statistical manual of mental disorders (DSM-IV) (8).

One of the alternative methods for FSD assessment is based on questionnaires. Various questionnaires are available for evaluation of FSD. For instance, female sexual function index (FSFI) is one of the most credible questionnaires in this regard, which has been shown to have acceptable internal consistency (Cronbach’s alpha: 0.89-0.98 for total score and scores in each domain). In addition, FSFI has adequate discrimination properties in all its domains. This questionnaire has been validated for the Iranian population, and normative data for this population is available as well (9,10).

Few studies have evaluated the rate of FSD in healthy, adult women in Iran and they were mostly conducted in Tehran city (4,11). Given the substantial effect of FSD on familial and personal relations, as well as the scarcity of regional data on this disorder in the Northeastern part of Iran, this study aimed to determine the prevalence of FSD and its risk factors in Sabzevar city, Iran.

Materials and Methods

Study subjects

This cross-sectional study was conducted on 264 women referring to 11 health centers in Sabzevar, Iran during October 2012-January 2013. Health centers were selected based on their geographical location from the north, center and south regions of the city. Married women with sexually active partners who agreed to participate were enrolled in the study, and written informed consent was obtained from all the subjects who met the inclusion criteria. Exclusion criteria of this study were as follows: 1) pregnancy; 2) history of sexual dysfunction; 3) breastfeeding and 4) drug addiction or alcoholism. Subjects completed FSFI and demographic questionnaires.

Data collection

FSFI questionnaire consists of 19 items to evaluate female sexual function within a period of four weeks. In this questionnaire, six main domains of sexual function are evaluated, including sexual desire, lubrication, sexual arousal, sexual satisfaction, orgasm and sexual pain (7,12). Questions are scored based on a Likert scale, and total score of FSFI is obtained by summing up the scores achieved in each domain.

In the present study, cut-off points for FSD were as follows: sexual desire: 3.3, sexual arousal: 3.4, lubrication: 3.7, sexual pain: 3.8, orgasm: 3.4 and sexual satisfaction: 3.8 (9). FSFI has been widely used in clinical and non-clinical settings, and the Persian version of this questionnaire has been validated for the Iranian population (13). Reliability of FSFI was assessed for the entire questionnaire, as well as the items in each domain, using Cronbach’s alpha. Cronbach’s alpha was calculated to be ≥0.70, which was indicative of adequate reliability coefficient. Moreover, sensitivity analysis for the Iranian version of FSFI determined score 28 as the cut-off point (sensitivity: 83%, specificity: 82%). In other words, total score of <28 was defined as sexual dysfunction, and higher scores were described as satisfactory sexual function (9).

Demographic questionnaires were used to collect the following data: age, number of children, duration of relationship with partner, age of partner, menstrual pattern, method of contraception, education level of subject and partner, employment status of partner, presence of diseases, consanguinity with partner, use of medications, family income status and history of sexual abuse.

If participants were not able to read or write, they would be assisted by the researcher to understand and complete the questionnaires
via interviews. Women diagnosed with sexual dysfunction at the end of the study were advised to consult a gynecologist.

This study was approved by the Ethics Committee of Sabzevar University of Medical Sciences, Iran.

**Statistical analysis**

In this study, data analysis was performed using SPSS V.20 (IBM Inc., Chicago, IL, USA). Study variables including age, income status, employment status and education status were presented as frequency and percentage. Normally distributed data were presented as mean and standard deviation (SD), while median and interquartile range (IQR) were used for data without normal distribution.

Chi-square test was used to evaluate the association between study variables and prevalence of FSD. In addition, general linear model (GLM) was applied to assess the effect of study variables on the total score of FSFI. Also, binary logistic regression was used to evaluate the relationship between total FSFI score and other study parameters.

Initially, univariate analysis was performed to verify the association between study variables and presence of FSFI, and variables with significant correlations were used in multiple regression analysis. Moreover, odds ratio with 95% confidence interval was used to describe the relationship between study parameters. It is noteworthy that subjects with history of sexual abuse were excluded from GLM and regression analysis in order to reduce bias. Confidence limit of this study was set at 0.95, and P-value of less than 0.05 was considered as statistically significant.

**Results**

In total, 264 women with mean age of 32.2±10.27 years were enrolled in this study (age range: 15-62 years). Natural birth control was the most common method of contraception among these women (31.1%), and 32.2% of the subjects had no children. The majority of participants had regular menstrual cycle (64%), and 7.6% were in menopause. In addition, 6.8% and 2.3% of the studied subjects were undergoing hormone therapy and psychotherapy, respectively. As for diseases, diabetes mellitus was reported in 2.3% of the subjects, while 3.4% had ovarian cysts, 2.7% had hypertension, and 0.8% of the women were infertile.

Consanguinity was reported in 78 couples (29.5%). With respect to age, only one woman was the same age as her partner, and 96 couples had age difference of less than two years. In terms of education level, more than one third of the participants (34.1%) were below diploma, and 97 women (36.7%) reported the education level of their partners to be below diploma. It is noteworthy that 3% of the study population had history of sexual abuse.

Among the studied subjects, prevalence of sexual dysfunction was estimated at 62.1% (n=164). Sexual dysfunction was observed to be most frequent in domains of sexual desire (49.2%), sexual arousal (43.2%), orgasm (38.6%), lubrication (36%), sexual pain (35.2%) and sexual satisfaction (26.1%), respectively (Figure 1).
Compared to women with normal sexual function, subjects with FSD were significantly older (P<0.001) and had lower education level (P<0.001). Moreover, rate of consanguinity was higher among women with FSD (P=0.005), and partners of these women were reported to have lower education level (P<0.001). Also, use of medications was more prevalent among women with FSD compared to subjects with normal sexual function (P=0.01) (Table 1).

According to other results of this study, number of children was significantly higher in women with FSD (median=2.0, IQR=2.0) compared to those with normal sexual function (median=1.0, IQR=2.0) (P<0.001). Additionally, women with FSD had longer marriages (median=3.0 years, IQR=3.0) compared to normal women (median=2.0 years, IQR=1.0) (P<0.001). Distribution of sexual dysfunction in different domains of FSFI is shown in Table 2.

According to the results of GLM analysis, factors such as employment status of spouse (P=0.03), use of medications (P=0.01) and education level of women (P=0.01) had significant effects on FSFI scores. As such, employment status of the spouse and low education level of women significantly reduced total FSFI scores.

Finally, univariate analysis revealed a significant correlation between FSD and variables such as age, personal and spousal education level, number of children, duration of marriage, consanguinity and use of medications. In addition, multiple regression analysis was indicative of a significant correlation between the education level of women and prevalence of FSD (P=0.01) (Table 3).

**Discussion**

Sexual function was first described in 1960 as a linear model consisting of four phases of excitement, plateau, orgasm and resolution. Later in 2002, non-linear model of sexual response was defined, especially for female gender, encompassing social and psychological aspects (1).

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**Table 1.** Distribution of Study Variables between Women with Female Sexual Dysfunction (FSD) and Normal Subjects

<table>
<thead>
<tr>
<th></th>
<th>FSD (N=164)</th>
<th>Normal (N=100)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-26 Years</td>
<td>47 (28.7%)</td>
<td>55 (55.0%)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>27-38 Years</td>
<td>60 (36.6%)</td>
<td>33 (33.0%)</td>
<td></td>
</tr>
<tr>
<td>&gt;39 Years</td>
<td>57 (34.8%)</td>
<td>12 (12.0%)</td>
<td></td>
</tr>
<tr>
<td>Consanguinity</td>
<td>58 (35.4%)</td>
<td>20 (20.0%)</td>
<td>0.005*</td>
</tr>
<tr>
<td>Medication Use</td>
<td>79 (48.2%)</td>
<td>33 (33.0%)</td>
<td>0.01*</td>
</tr>
</tbody>
</table>
Sexual health is a complicated term covering a wide range of health aspects. According to the report published by the World Health Organization (WHO) in 2006, sexual health defines not only as the absence of sexually transmitted diseases, but is also related to mental, physical and emotional well-being of an individual. Any malfunction in the aforementioned aspects could lead to sexual dysfunction. Therefore, a respectful approach free of discrimination is needed as to maintain sexual health in a community (14).

According to the results of the present study, FSD has a relatively high prevalence among Iranian women (62.1%). In a large-scale study, highest rate of sexual function problems in all categories was reported in regions of South-east Asia. As such, low sex drive and inability to reach orgasm were the most prevalent domains of sexual dysfunction in these areas (15). In another population-based study in Iran, FSD status was evaluated in three levels of mild (total FSFI score: 18-23), moderate (total FSFI score: 11-17) and severe (total FSFI score: ≤10). According to the findings, 24.9% of the population had moderate or severe sexual dysfunction. Furthermore, 31.5% of the studied women were reported to have disorders in at
least one of the domains of FSD (4).

In one study conducted in Turkey, rate of FSD was reported to be 43.4% (total FSFI score: <26) (16). Considering total FSFI score of <28 as the presence of FSD, approximately 62% of the study population in Turkey had FSD, which is significantly higher than the rate reported by similar studies. Variations in the reported prevalence rates of FSD could be due to the differences in defining cut-off points for FSFI scores in related studies. In the current study, cut-off point for FSD was determined with 83% sensitivity and 82% specificity (9).

In the present study, sexual desire was the most frequent domain of FSD (49.2%). This finding is inconsistent with the results obtained by a similar study in Iran, which reported orgasmic disorders as the most prevalent domain (37%), and sexual desire as the second most common problem among women with FSD (35%). This difference could be due to variations in cut-off points determined for FSD domains. In the current study, we used different cut-off points for each domain, while previous studies determined the cut-off point at 3.9 for all domains, which is higher than the value considered in the present study (4).

In the current study, rate of FSD was observed to increase with age (Figure 2). Common belief suggests that sexual disorders tend to be more prevalent in middle-aged women, as well as those ageing ≥27 years (4, 16-18). Increased prevalence of FSD is mainly associated with age due to decreased sex drive, reduced sexual intercourse and vaginal dryness caused by menopause (i.e., low estrogen secretion) (19).

![Figure 2. Total Female Sexual Function Index (FSFI) Scores in Different Age Groups](image)

In the present study, a significant correlation was observed between duration of relationship with partner and prevalence of FSD. Another research performed in the same region as the current study indicated that the rate of sexual problems decreased significantly with longer duration of relationship between partners (20). These inconsistencies between the findings could be due to the use of different questionnaires. While previous studies used researcher-designed questionnaires, we used the validated Persian translation of FSFI scale. Furthermore, multiple logistic regression indicated that FSD had no correlations with the education level of spouse, which is in line with the findings of a similar study conducted in Iran (21).

Results of the present study revealed that low education level has a significant effect on the manifestations of FSD, and this finding was confirmed by another study in this regard, which identified low education level as a predictor for sexual complaints (22).

There is controversy regarding the effect of menopause on FSD. While some studies have reported that menopause has no impact on
sexual dysfunction, other researchers believe that menopause could adversely affect FSD (3, 17). For instance, one study performed on the Iranian population found a significant correlation between FSD, menopause and education level of spouse (23). According to their results, menopausal symptoms, such as sleep disturbance and depression, could lead to decreased sex drive in women regardless of hormonal changes associated with menopause (24, 25). Due to this controversy, our subjects were not assessed separately from menopausal women.

**Study limitations**

In the present study, we evaluated women with psychological problems and diabetes, as well as those undergoing hormonal therapy and receiving anti-hypertensive drugs. Including such patients in our analysis could have affected the obtained results. However, it should be noted that the main objective of this study was evaluation of FSD in a random sample of women; therefore, this issue seems justifiable. In addition, male factors involved in the prevalence of FSD were not fully assessed due to cultural restrictions. Researchers had no access to all male partners, and our participants were not allowed to take questionnaire out of the study setting. Furthermore, most women refused to involve their husbands in the study.

Another limitation of the current study was exclusion of cases with missing data from multivariate logistic regression, which resulted in some inconsistencies between the results of univariate and multivariate logistic regression.

**Conclusion**

According to the results of the present study, sexual desire is the most significant contributing factor to FSD. The majority of our participants aged ≥27 years and had at least one of the risk factors of FSD. In conclusion, high prevalence of sexual disorders among women should be alarming for health care providers in Iran. Since sexual dysfunction could pose a serious threat to marriage and familial relations, and education seems to have insignificant effect on FSD, it is recommended that special clinics be established for the improvement of sexual issues in our country.

**Conflicts of Interest**

The authors declare no conflicts of interest.

**References**

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