ABSTRACT

Introduction: Female sexual dysfunction (FSD) is a common health problem that is inadequately investigated in Saudi Arabia.

Aim: To assess the prevalence and predictors of FSD in a sample of Saudi women attending the primary care and gynecology clinics.

Methods: A cross-sectional clinic-based survey involved Saudi women attending primary care and gynecology clinics in a teaching hospital in Riyadh during the period from January to June 2019. Data were collected using a structured interview questionnaire. Female sexual function has been evaluated by the Arabic version of the Female Sexual Function Index.

Main outcome measures: The main outcome measure of this study was female sexual function using the Arabic version of the Female Sexual Function Index.

Results: 200 Saudi women were included in this study. Their age ranged from 18 to 50 years. Most of the participants (88.5%) were fairly satisfied or satisfied with their spouse’s sexual ability and 120 (60%) had a risk of FSD. Participants with FSD reported the lowest scores for arousal and desire domains (3.03 ± 1.3 and 3.12 ± 1.1, respectively) followed by orgasm domain (3.48 ± 1.4). Predictive factors for risk of FSD in our participants were age greater than 40 years (P = .012), unemployment (P = .035), low/moderate family income (P = .014), dissatisfaction with the spouse’s sexual ability (P = .005), and higher weight (P = .010) and height (P = .043). Only age greater than 40 years (P = .041), low family income (P = .007), and dissatisfaction with spouse’s sexual ability (P = .011) sustained independent significance in a multivariate logistic regression analysis.

Conclusion: A high prevalence of FSD was encountered in our sample of Saudi women. Desire and arousal were the most significantly affected domains followed by orgasmic problems. Age greater than 40 years, low socioeconomic level, and dissatisfaction with the spouse’s sexual ability are the most significant predictors.

INTRODUCTION

Sexual function is an essential component of life, and its dysfunction can impose a negative impact on the well-being of an individual. Female sexual dysfunction (FSD) is a highly prevalent, underestimated health problem. According to the Diagnostic and Statistical Manual of Mental Diseases, sexual dysfunction is characterized by a disturbance in the sexual response cycle or by pain associated with sexual intercourse. It is defined as a disorder of sexual desire, arousal, or orgasm and/or sexual pain that leads to...
personal distress and affects quality of life and interpersonal relationships.\textsuperscript{5}

Epidemiological data have estimated that prevalence of FSD may be 30–63%.\textsuperscript{2,6,7} Sexual dysfunction is often multifactorial and can be associated with age, social strata, level of education, employment, religion, and biological, medical, and psychological factors.\textsuperscript{7} The prevalence of FSD and influencing factors is variable among countries and different areas.\textsuperscript{3,8}

Assessment of female sexual function and FSD includes questionnaires, structured interviews, and comprehensive case history. Questionnaires are currently the first choice to screen individuals into different FSD categories.\textsuperscript{1} The Female Sexual Function Index (FSFI) is a brief validated 19-item multidimensional self-reporting measure that quantifies 6 domains, including desire, arousal, lubrication, orgasm, satisfaction, and pain scale for evaluation of sexual function in women.\textsuperscript{9,10} A validated Arabic version of the Female Sexual Function Index (ArFSFI) was shown to be a reliably acceptable tool for FSD local assessment.\textsuperscript{11}

Although FSD is a common health problem, it is still underinvestigated particularly in Eastern communities, where its open discussion is considered a taboo.\textsuperscript{8} Moreover, the Arabic culture is generally conservative toward sex and female sexuality.\textsuperscript{11}

How much risk of FSD is prevalent in Saudi Arabia and what exactly is its magnitude are common questions. Our aim is to evaluate the prevalence and predictors of FSD among a sample of women attending the primary care and gynecology clinics.

MATERIALS AND METHODS

A nonprobability, cross-sectional clinic-based survey involved Saudi women attending primary care and gynecology clinics in King Khalid University Hospital, King Saud University, Riyadh, Saudi Arabia, in the period from January to June 2019. Inclusion criteria were as follows: nonpregnant, nonlactating Saudi women aged between 18 and 50 years, married and sexually active during the past 6 months, able to give consent, and able to read and/or understand Arabic. Women with significant cardiovascular, renal, hepatic, or respiratory diseases that affect their daily activities, those who had undergone major pelvic surgery (eg, hysterectomy, cystectomy), and those with any proven psychiatric or mental illness were excluded.

Questionnaire

Data were collected using a structured interview questionnaire where each participant was interviewed and given the same questions, in the same way and in the same order. Sexual function was evaluated using the ArFSFI. This is a 19-item questionnaire measuring self-reported female sexual function during the last 4 weeks. The ArFSFI is divided into a 6-domain structure that includes desire (2 questions), arousal (4 questions), lubrication (4 questions), orgasm (3 questions), satisfaction (3 questions), and pain (3 questions).\textsuperscript{11} With a maximum score of 36, a total score of 26.55 or less was confirmed to be indicative of FSD.\textsuperscript{10}

Our assessment questionnaire otherwise included demographic characteristics such as participant’s age, education level, occupation, family income (low or moderate vs high), and living environment (urban or rural). The height and weight of the participants were registered, and the body mass index was calculated. Other aspects of reproductive function were included such as the duration of marriage, menstrual status (regular, irregular, postmenopausal), and the mode of delivery (normal labor, caesarean section, or primary infertility). Evaluation also involved degree of satisfaction with spouse’s sexual ability (severely dissatisfied, dissatisfied, fairly satisfied, or satisfied) according to a subjective personal impression of the female participant and chronic medical disease, for example, diabetes, asthma, hypothyroidism, and so forth.

Ethical Approval

All procedures were consistent with the institutional research committee’s ethical standards (Reference number 18/0279/IRB) and with the Helsinki Declaration of 1964 and its later modifications or comparable ethical standards.

Informed consent has been given by all women who agreed to participate in the study.

Statistical Analysis

The impact of the different demographics and clinical characteristics on female sexual function was assessed using the chi-square test/Fisher’s exact test for categorical variables and Student’s t-test for continuous variables.

The influence of significant parameters was further evaluated by binary logistic regression analysis to determine significant independent predictors. Family income and satisfaction with spouse’s sexual ability were dichotomized for better fit into the logistic regression model. Odds ratios and 95% CI s were calculated separately for each factor. A P-value of less than .05 was considered significant for all tests performed using SPSS statistics (version 21; IBM Corp, Armonk, NY).

RESULTS

The study included a total of 200 Saudi women. Table 1 shows their various sociodemographic and clinical characteristics. Their age ranged from 18 to 50 years, mostly resident in rural areas (87%), with moderate family income (86%), and with high school or above level of education (92%). Of them, 2% were postmenopausal and 3.5% were infertile. Most of the participants (88.5%) were fairly satisfied or satisfied with their spouse’s sexual ability.

Of the participants, 120 (60%) had a risk of FSD using a cut-off score value of 26.55. The overall mean FSFI score was 23.98 ± 5.78. The total FSFI and domains scores were significantly less in participants with the risk of FSD apart from the pain domain score (P = .058). The total FSFI and domains scores are shown in Table 2. The lowest mean score in
participants with the risk of FSD is reported for arousal (3.03 ± 1.3) and desire scores (3.12 ± 1.1) followed by orgasm score (3.48 ± 1.4).

Univariate analysis of possible predictive factors showed that the risk of FSD is more likely in women older than 40 years (P = .012), who are unemployed (P = .035), with low/moderate family income (P = .014), who are not satisfied with the spouse’s sexual ability (P = .005), and with a higher weight (P = .010) and height (P = .043) as demonstrated in Table 3. However, only age greater than 40 years (P = .041), low family income (P = .007), and dissatisfaction with spouse’s sexual ability (P = .011) sustained independent significance in a multivariate logistic regression analysis (Table 4). Women older than 40 years were 5 times more likely to report FSD. Those with low or moderate family income had 6.06 times more risk to have FSD. Likewise, women dissatisfied with their spouse’s sexual ability were 5 times more likely to suffer FSD.

**DISCUSSION**

Female sexual functioning is the ability to achieve sexual arousal, lubrication, orgasm, and satisfaction resulting in well-being and a good quality of life. Diminished sexual function results in significant personal distress and has an impact on quality of life and interpersonal relationships.

Sexual dysfunction has been found to be more prevalent in women than in men and varies according to ethnicity, psychodemographic characteristics, and physical and psychological health status. Our study presents epidemiological data on the prevalence and predictors of FSD in a sample of Saudi women. We emphasize the high prevalence (60%) risk of FSD among our participants. Our data are consistent with reports from Egypt, Jordan, China, and Japan. Slightly lower rates were reported in Turkey (43.4%), Iran (46.2%), and the United States. The difference in the risk of FSD rates recorded by different countries may reflect medical and psychological factors, influence of socioeconomic, cultural, and racial differences, the clinical

| Table 1. Participants’ sociodemographic and clinical characteristics |
|--------------------------|--------------------------|--------------------------|
| **Characteristic**       | **Number (%)**           |
| Age (years)              |                          |
| 18–30                    | 74 (37)                  |
| 31–40                    | 111 (55.5)               |
| 41–50                    | 15 (7.5)                 |
| Education level          |                          |
| Primary school           | 5 (2.5)                  |
| Intermediate school      | 11 (5.5)                 |
| High school              | 50 (25)                  |
| College                  | 118 (59)                 |
| Postgraduate             | 16 (8)                   |
| Employment               |                          |
| No                       | 117 (58.5)               |
| Yes                      | 83 (41.5)                |
| Family income            |                          |
| Low                      | 12 (6)                   |
| Moderate                 | 172 (86)                 |
| High                     | 16 (8)                   |
| Residence status         |                          |
| Urban                    | 6 (3)                    |
| Rural                    | 194 (97)                 |
| Circumcision             |                          |
| Circumcised              | 10 (5)                   |
| Uncircumcised            | 190 (95)                 |
| Duration of marriage     |                          |
| <5 yrs                   | 50 (25)                  |
| 5–10 yrs                 | 55 (27.5)                |
| >10 yrs                  | 95 (47.5)                |
| Menstrual status         |                          |
| Regular                  | 155 (77.5)               |
| Irregular                | 41 (22)                  |
| Postmenstrual            | 4 (2)                    |
| Mode of delivery         |                          |
| Normal labor             | 149 (74.5)               |
| Caesarean section        | 44 (22)                  |
| Primary infertility      | 7 (3.5)                  |
| Satisfaction with spouse sexual ability |        |
| Severely dissatisfied    | 5 (2.5)                  |
| Dissatisfied             | 18 (9)                   |
| Fairly satisfied         | 75 (37.5)                |
| Satisfied                | 102 (51)                 |
| Chronic pelvic pain      |                          |
| No                       | 141 (70.5)               |
| Yes                      | 59 (29.5)                |
| Gynecological disease    |                          |
| No                       | 166 (83)                 |
| Yes                      | 34 (17)                  |
| Pelvic surgery           |                          |
| No                       | 190 (95)                 |
| Yes                      | 10 (5)                   |
| Chronic medical disease  |                          |
| No                       | 181 (90.5)               |
| Yes                      | 19 (9.5)                 |

| Table 2. Total female sexual function index and domains score |
|--------------------------|--------------------------|--------------------------|
| **Domain**               | **Sexual dysfunction**   | **No sexual dysfunction** | **Total**           |
| Desire                   | 3.12 (1.1)               | 4.46 (.81)               | 3.66 (1.12)         |
| Arousal                  | 3.03 (1.3)               | 5.04 (.51)               | 3.83 (4.20)         |
| Lubrication              | 4.02 (1.3)               | 5.1 (.73)                | 4.45 (1.26)         |
| Orgasm                   | 3.48 (1.4)               | 5.22 (.73)               | 4.17 (1.48)         |
| Satisfaction             | 3.9 (1.5)                | 5.42 (.66)               | 4.5 (1.42)          |
| Pain                     | 3.26 (1.1)               | 3.4 (.51)                | 3.36 (.97)          |
| Total score              | 20.8 (5.3)               | 28.73 (1.5)              | 23.98 (5.78)        |

*Domain scores are presented as the mean (SD).*
| Characteristic                        | Sexual dysfunction | No sexual dysfunction | P       | Test       |
|--------------------------------------|--------------------|-----------------------|---------|------------|
| Age                                  |                    |                       |         |            |
| 30 yrs or less                       | 36 (48.6%)         | 38 (51.4%)            | .023    | Chi-square |
| 31–40 yrs                            | 72 (64.9%)         | 39 (35.1%)            | .811    | Chi-square |
| Older than 40 yrs                    | 12 (80%)           | 3 (20%)               | .       |            |
| Education level                      |                    |                       |         |            |
| Primary school                       | 3 (60%)            | 2 (40%)               | .811    | Chi-square |
| Intermediate school                  | 5 (45.5%)          | 6 (54.5%)             |         |            |
| High school                          | 31 (62%)           | 19 (38%)              | .       |            |
| College                              | 70 (59.3%)         | 48 (40.7%)            | .       |            |
| Postgraduate                         | 11 (68.8%)         | 5 (31.3%)             | .       |            |
| Employment                           |                    |                       |         |            |
| No                                   | 63 (53.8%)         | 54 (46.2%)            | .035    | Chi-square |
| Yes                                  | 57 (68.7%)         | 26 (31.3%)            | .       |            |
| Family income                        |                    |                       |         |            |
| Low or moderate                      | 115 (62.5%)        | 69 (37.5%)            | .014    | Chi-square |
| High                                 | 5 (31.3%)          | 11 (68.8%)            | .       |            |
| Living environment                   |                    |                       |         |            |
| Urban                                | 5 (83.3%)          | 1 (16.7%)             | .405    | Fisher’s exact |
| Rural                                | 115 (59.3%)        | 79 (40.7%)            |         |            |
| Circumcision                         |                    |                       |         |            |
| Circumcised                          | 7 (70%)            | 3 (30%)               | .743    | Fisher’s exact |
| Uncircumcised                        | 113 (59.5%)        | 77 (40.5%)            |         |            |
| Duration of marriage                 |                    |                       |         |            |
| <5 yrs                               | 25 (50%)           | 25 (50%)              | .154    | Chi-square |
| 5–10 yrs                             | 32 (58.2%)         | 23 (41.8%)            |         |            |
| >10 yrs                              | 63 (66.3%)         | 32 (33.7%)            | .       |            |
| Menstrual status                     |                    |                       |         |            |
| Regular                              | 89 (57.4%)         | 66 (42.6%)            | .372    | Chi-square |
| Irregular                            | 28 (66.3%)         | 13 (31.7%)            |         |            |
| Postmenstrual                        | 3 (75%)            | 1 (25%)               | .       |            |
| Mode of delivery                     |                    |                       |         |            |
| Normal labor                         | 87 (58.4%)         | 62 (41.6%)            | .676    | Chi-square |
| Caesarean section                    | 28 (63.6%)         | 16 (36.4%)            |         |            |
| Primary infertility                  | 5 (71.4%)          | 2 (28.6%)             | .       |            |
| Satisfaction with spouse’s sexual ability |                |                       |         |            |
| Dissatisfied                         | 20 (87%)           | 3 (13%)               | .005    | Chi-square |
| Fair or satisfied                    | 100 (56.5%)        | 77 (43.5%)            | .       |            |
| Chronic pelvic pain                  |                    |                       |         |            |
| No                                   | 82 (58.2%)         | 59 (41.8%)            | .411    | Chi-square |
| Yes                                  | 38 (64.4%)         | 21 (35.6%)            | .       |            |
| Gynecological disease                |                    |                       |         |            |
| No                                   | 98 (59%)           | 68 (41%)              | .539    | Chi-square |
| Yes                                  | 22 (64.7%)         | 12 (35.3%)            |         |            |
| Pelvic surgery                       |                    |                       |         | Fisher’s exact |
| No                                   | 114 (60%)          | 76 (40%)              | 1.000   | Fisher’s exact |
| Yes                                  | 6 (60%)            | 4 (40%)               |         |            |
| Chronic medical disease              |                    |                       |         |            |
| No                                   | 106 (58.6%)        | 75 (41.4%)            | .201    | Chi-square |
| Yes                                  | 14 (73.7%)         | 5 (26.3%)             |         |            |
| Mean weight (kg.)                    | 72.52 (±13.4)      | 67 (±11.7)            | .010    | t-test     |
| Mean height (cm.)                    | 159.79 (±6.7)      | 157 (±6.5)            | .043    | t-test     |
| Mean BMI                             | 28.48 (±5.5)       | 27.19 (±4.5)          | .085    | t-test     |

BMI = body mass index.
Bold values indicate statistical significance.
Table 4. Significant independent predictors of sexual dysfunction in Saudi women

| Predictor                          | P     | Odds ratio | 95% CI     |
|-----------------------------------|-------|------------|------------|
| Age                               | .041  | 4.996      | 1.069−23.344 |
| Family income                      |       |            |            |
| Low or moderate                    | .007  | 6.060      | 1.630−22.531 |
| Satisfaction with spouse’s sexual ability |       |            |            |
| Dissatisfied                       | .011  | 5.991      | 1.507−23.824 |

The definition used for each dysfunction, and the criteria of samples examined (general population vs sexuality clinics).

The total and domain sexual function scores in our study were statistically significant between participants with and without risk of FSD (Table 2), confirming the previously reported high predictive capacity of the FSFI and ArFSFI in discriminating such conditions.9–11

Our results showed that arousal (3.03 ± 1.3) and desire (3.12 ± 1.1) were the most affected domains. Similar results were reported by Aslan et al19 in a study that included 1,009 Turkish women. Desire and arousal disorders are the most frequently reported female sexual problems in the literature.15,16,18,20–23

Based on epidemiological data obtained from a National Health and Social Life Survey of the U.S. population, it has been estimated that a third of women lacked sexual interest and almost a fourth had no orgasms.2 Oberg et al recorded that 45% of Swedish women had reduced desire.24 Higher rates of 60% were reported in Turkish women.25 Rates of 32–43% were reported for sexual arousal disorders.15,17,20,25 Others reported orgasm as the most affected domain.15,26

Many potential risk factors for FSD were suggested including biological factors (eg, age, hormone level, pelvic floor disorder, and pelvic surgery), social factors (eg, education level, economic level, social status, local culture, and religion), and psychological factors (eg, mood, intimacy with the spouse, and marital relationship).3

Age, economic level, and satisfaction with spouse’s sexual ability were the only predictive factors shown in our study (Table 4). No significant differences were detected for menstrual status, the mode of delivery, the duration of the marriage, and chronic diseases. Similar findings were recorded by Aslan et al.19 The present study showed the increased risk of FSD with age. Our findings showed that age greater than 40 years increased FSD risk by about 5 times. Lewis et al27 reported that low sexual function prevalence increases as men and women age. The International Women’s Survey on Health and Sexuality investigated participants from Europe (France, Germany, Italy, and the United Kingdom) and the United States aged between 20 and 70 years and reported that sexual activity decreased with aging and the proportion of women with low sexual function, specifically low desire, increased with age.22,28 Similarly, Abduljabbar et al29 recorded a significantly greater incidence risk of FSD greater than the age of 40 years in a group of 194 Saudi women using abridged 6-item version of the FSFI. Similar results were reported in studies of Egyptian,15 Turkish,19 Iranian,30 and Japanese18 women. Elnashar et al16 documented a substantial association between women’s age and sexual problems using a tool other than the FSFI. They reported lower rates of FSD risk in women aged 20–29 years than in women aged between 40 and 49 years. Low sexual function with aging is possibly due to the age-associated physiological changes in hormones, psychosocial and interpersonal factors, medication use, and associated diseases.2

Laumann et al2 reported that low socioeconomic status and low level of education were risk factors for FSD. In 28.1% of respondents in lower Egypt, unfavorable economic conditions were among the aggravating factors for their sexual problems.16 Our findings showed that low sexual function is more common in women with lower family income (odds ratio: 6.06). This may be attributed to the low family income—associated female stress, anxiety, and depression.

Results of studies investigating the level of education as a risk factor were variable. Reports found no relationship,15,21 others showed that higher educational status is associated with a less risk of FSD.3,25,30 The reverse was also reported.31 The education level had no significance as related to the FSD risk in our participants.

Male erectile or other male sexual dysfunctions have significant adverse effects on the sexual function of their female partners.32 Furthermore, the risk of FSD may improve after the treatment of male sexual dysfunction.32,33 Dissatisfaction with spouse’s sexual ability increased the risk of FSD by about 6 times in our respondents (Table 4). Similarly, Lou et al3 reported a 6.94 increased risk of FSD due to dissatisfaction with spouse’s sexual ability in 5,024 women in Beijing, China. A high risk of FSD because of dissatisfaction with spouse’s sexual ability was also reported in Egyptian,15 Turkish,19 Iranian,30 and Japanese18 women.

FSD is a common, underinvestigated health problem. Furthermore, many women are hesitant to discuss their sexuality and sexual health issues with their health-care providers. The situation is even more difficult in Eastern countries where it is considered as a taboo. Published reports on the risk of FSD from Saudi Arabia are scarce. They are limited by the use of either a nonvalidated Arabic version14,35 or abridged 6-item version of the FSFI17 or surveying special participant populations.36,37 The present study is accredited with the use of the ArFSFI, its prospective nature, and the inclusion of married women only meaning that they are in a stable relationship. Furthermore, the structured interview has ensured that all questions from all the participants were answered completely and consistently. However, it is still limited by its cross-sectional hospital-based nature and the relatively small number of participants; thus, the results could not be extrapolated to the whole community without caution. Male partners were not interviewed or evaluated regarding their sexual performance. Data about their sexual abilities were obtained from their female partners, which may be subjective, incompletely accurate, or biased.
Our study addresses a significant and common health problem that is not adequately studied in our community. It emphasizes the high prevalence of the FSD risk that deserves attention as a major public health concern, with a need for more epidemiological, community-based studies. The knowledge and competency of physicians in FSD is increasingly required, so that they can professionally approach women with such dysfunction. We strongly recommend the use of the full version of the ArFSFI in the assessment of women with such dysfunction both in clinical and research settings for better standardization and comparison.

CONCLUSIONS

Female sexual problems are highly prevalent in this sample of Saudi women. The prevalence of low sexual function in the participants was significantly associated with female age, low socioeconomic level, and dissatisfaction with the spouse’s sexual ability. Desire and arousal were the most significantly affected domains followed by orgasmic problems. Larger epidemiologic, community-based studies are strongly warranted.

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