

Bringing the body of the iceberg to the surface: the Female Sexual Dysfunction Index-6 (FSDI-6) in the screening of female sexual dysfunction

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Abstract

Purpose Female Sexual Dysfunction (FSD) is a still poorly studied and underdiagnosed condition. The aim of the study was to produce an improved version of FSFI-6 (6-Item Version of the Female Sexual Function Index), entitled Female Sexual Dysfunction Index-6 (FSDI-6), and to estimate its accuracy as a screening instrument for FSD.

Methods In the new version, an item related to the personal interest in having a satisfying sex life was added, while the item rating the entity of sexual arousal was removed. We administered FSDI-6 in a consecutive series of female adult patients not consulting for sexual problems ($n = 120$, Cohort 1), and in another series of patients specifically consulting for sexual problems, which were considered as the control group ($n = 160$, Cohort 2).

Results FSDI-6 score was significantly higher in patients in Cohort 2 ($p < 0.0001$). Cronbach's alpha for FSDI-6 was 0.784, indicating a high level of reliability. The estimated area under the ROC curve for FSDI-6 was 0.657

($p < 0.0001$, 95 % CI 0.584–0.730). The proportion of subjects with a pathological FSDI-6 score (≥ 16.5) was 29.9 ($n = 32$) and 59.4 % ($n = 95$) in Cohort 1 and 2, respectively ($p < 0.0001$). Among subjects with a pathological FSDI-6 (score ≥ 16.5), those consulting for FSD had been postmenopausal for fewer years, had a higher level of education, a lower BMI and a lower prevalence of chronic diseases than those not consulting for FSD ($p < 0.05$).

Conclusions Although a lower educational level, overweight/obesity, menopause and chronic diseases are risk factors for FSD, they are often associated with the failure in medical consultation for FSD. We propose that FSDI-6 should be performed by health care providers in non-specialist settings to detect potential FSD, which otherwise could remain under-diagnosed.

Keywords Screening · Questionnaire · Female sexual dysfunction · Referral

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Introduction

During the last few years, the World Health Organization has recognized female sexuality not only as an important component of women's health, but also as a basic human right [1]. According to the data of the National Health and Social Life Survey, conducted in the US population [2], sexual dysfunction is more frequent in women (43 %) than in men (31 %). Further studies suggest that approximately 40–50 % of US women could be classified as having at least one sexual difficulty [2–7]. Conversely, a multinational survey reported a prevalence of sexual problems that was generally lower in Europe (25–29 %) than in other regions of the world [8]. Data from the “Women's International Sexuality and Health Survey” (WISHeS), a mail

survey involving 1356 women between the ages of 20 and 70 from Germany, the United Kingdom, France and Italy, reported that 29 % of women had some form of Female Sexual Dysfunction (FSD) [9]. Similar findings have been reported by Nappi and coworkers [10] in a recent Italian survey investigating sexual function in healthy women attending a gynecological office.

Data on the prevalence of FSD are obtained through studies on representative samples, in which symptoms of sexual dysfunction are proactively investigated. However, it is likely that only a fraction of women with FSD seek care for this condition. In many countries, the lack of reporting of sexual problems could be due to socio-cultural factors such as race, ethnicity and religion. In fact, women's difficulty and embarrassment in spontaneously sharing their sexual concerns with physicians can easily prevent medical referral. Indeed, surveys consistently show that patients want to discuss their sexual problems with health care providers, but are reluctant to initiate the conversation [11]. On the other hand, physicians' scarce habit of communicating with women about their sexuality could also contribute to the underestimation of the true prevalence of FSD. A simple, patient-administered assessment tool could be a useful instrument in increasing the likelihood of diagnosing FSD in the majority of clinical settings, and to refer women to appropriate services if needed [11].

The purpose addressed by the present study was to further improve a reliable and easy-to-administer questionnaire, validated for the screening of FSD in non-specialist settings [6-Item Version of the Female Sexual Function Index (FSFI)] [12, 13]. A new version of the FSFI was produced and entitled Female Sexual Dysfunction Index-6 (FSDI-6), to identify the presence of FSD in a population not referring for this problem. Since we wanted to focus on the subjective nature of the disorder, we added, as the first item, a question related to the personal interest in having a satisfying sex life. It has been reported that the relationship between women's sexual function and their affective responses is very complex: many women complain about FSD without notable levels of distress, and vice versa [14]. The subjective relevance attributed to sexuality could be one of the factors modulating distress levels, and is worth evaluating. This distinctive feature of FSDI-6 points towards the view that distress is a key criterion for the definition of many mental disorders, as emphasized in the Diagnostic and Statistical Manual of Mental Disorders (DSM)-5 [15]. Furthermore, the item rating the entity of sexual arousal was removed, because one of the major changes of the DSM-5 is the merger of disorders of desire and arousal [15]. The decision to combine the two diagnoses is based on the conclusion that the two disorders cannot be reliably differentiated [16]. However, it has also been

argued that this new criterion could be counterproductive, because women with low desire often complain only of reduced receptivity, and were, therefore, likely to be excluded [17]. Hence, we decided to maintain a question related to genital sensation and lubrication during sexual activity.

We then administered FSDI-6 in a consecutive series of female adult patients not consulting for sexual problems, and in another series of patients specifically consulting for sexual problems, which were considered as the control group. The aim of our study was to estimate the accuracy of FSDI-6 and to validate it as a screening instrument for FSD.

Patients and methods

The study included a consecutive series of 160 women attending the Sexual Medicine and Andrology Outpatient Clinic for sexual dysfunctions at the University of Florence between January and December 2014 (Cohort 2) and a consecutive series of 120 women visited at the Diabetes Clinic of Azienda Ospedaliero-Universitaria Careggi, Florence between January and February 2014 (Cohort 1). As per clinical practice, patients attending the Diabetes Clinic had been referred for suspected or overt diabetes mellitus, dyslipidemia, overweight, obesity and other related disorders. The inclusion criteria required that patients agreed to have a complete sexological assessment and medical examination, were at least 18 years old, and had been in a stable relationship with a male partner for at least the past 6 months. An informed consent for the study was obtained from all participants. Demographic and clinical data were collected from clinical records, including a medical history with detailed information on menopause, on any current pharmacological treatment (in particular oral contraceptives, hormonal replacement therapy and psychiatric medications) and associated medical conditions. At the first visit, patients underwent a physical examination with measurements of body weight and height. Furthermore, all subjects enrolled fulfilled both FSFI-6 [13] and the new modified version, FSDI-6. A question related to the personal interest in having an active sex life was added, whereas the item rating the entity of sexual arousal was removed (see Appendix Table 4). Because the purpose of FSDI-6 is to screen for women suffering from sexual dysfunction, the original score system was inverted and, therefore, higher scores were considered pathological. Patients were also asked to complete the modified Middlesex Hospital Questionnaire (MHQ) [18], a brief self-reported questionnaire for the screening of mental disorders in a non-psychiatric setting, which provides scores for free-floating anxiety (MHQ-A), phobic anxiety (MHQ-P), obsessive-compulsive traits and

Table 1 Characteristics of the two cohorts

	Cohort1 (n = 120)	Cohort 2 (n = 160)	p
Age (years)	47.99 ± 10.41	45.72 ± 12.68	NS
BMI (kg/m ²)	30.45 ± 8.16	26.39 ± 6.70	<0.0001
Years of education	13.14 ± 4.47	11.97 ± 4.08	0.045
Menopausal (%)	49.2 (n = 59)	43.2 (n = 76)	NS
Age at menopause (years)	49.64 ± 3.99	48.80 ± 4.81	NS
Years since menopause	4.37 ± 6.60	3.82 ± 5.98	NS
Hormonal replacement therapy (%)	1.7 (n = 1)	13.3 (n = 10)	0.015
History of surgical menopause (%)	6.8 (n = 4)	6.7 (n = 5)	NS
History of mammalian surgery (%)	3.3 (n = 4)	8.3 (n = 15)	NS
History of pelvic surgery (%)	14.2 (n = 17)	38.9 (n = 70)	<0.0001
History of bariatric surgery (%)	32.5 (n = 39)	0 (n = 0)	<0.0001
Diabetes mellitus (%)	44.2 (n = 53)	7.8 (n = 14)	<0.0001
Dyslipidemia (%)	25 (n = 30)	13.3 (n = 24)	0.010
Hypertension (%)	35 (n = 42)	12.2 (n = 22)	<0.0001
Type 1 diabetes (%)	23.1 (n = 12)	7.1 (n = 1)	NS
Type 2 diabetes (%)	76.9 (n = 40)	92.9 (n = 13)	NS
Complications of diabetes mellitus (at least one) (%)	20.8 (n = 11)	1 (n = 7.1)	NS
Psychiatric diseases (%)	15.8 (n = 19)	29.3 (n = 53)	0.007
Reported psychoactive medications (%)	16.7 (n = 20)	23 (n = 42)	NS
History of neoplasm (%)	1.7 (n = 2)	1.7 (n = 3)	NS
Oral contraceptives (%)	11.5 (n = 7)	18 (n = 18)	NS
FSDI-6 score	14.30 ± 6.64	17.13 ± 4.40	<0.0001
FSFI-6 score	16.64 ± 6.99	14.93 ± 7.88	NS
Intrapsychic parameters as derived by MHQ-questionnaire			
MHQ-A score (free-floating anxiety symptoms)	7 [0–14]	8 [0–15]	NS
MHQ-P score (phobic anxiety symptoms)	5.5 [0–14]	5.5 [0–14]	NS
MHQ-O score (obsessive–compulsive traits and symptoms)	5 [0–15]	7 [0–14]	0.001
MHQ-S score (somatized anxiety symptoms)	4 [0–13]	5 [0–15]	NS
MHQ-D score (depressive symptoms)	5 [0–14]	6 [0–15]	NS
MHQ-H score (hysterical symptoms and traits)	5 [0–13]	5 [0–15]	NS

Data are expressed as mean ± SD when normally distributed, median [quartiles] when not normally distributed, and as percentages when categorical

BMI Body Mass Index, FSFI-6 Female Sexual Function Index-6, FSDI-6 Female Sexual Dysfunction Index-6, MHQ Middlesex Hospital Questionnaire, NS not significant

symptoms (MHQ-O), somatized anxiety symptoms (MHQ-S), depressive symptoms (MHQ-D), and histrionic/hysterical traits (MHQ-H).

Statistical analysis

Data were expressed as mean ± standard deviation when normally distributed, median [quartiles] for parameters not normally distributed, and as percentages when categorical. Cronbach’s alpha was used to estimate internal consistency. Student’s test for independent samples was used to compare continuous variables and Chi square test was used for between-group comparisons of categorical variables.

Receiver operating characteristic (ROC) curve analysis was performed for the assessment of sensitivity, specificity, and predictive values of FSD. All statistical analysis was performed on SPSS for Windows 22.0 (SPSS Inc., Chicago, IL, USA), and p < 0.05 was considered statistically significant.

Results

Cohort 1 and 2 were made up of 120 and 160 women, respectively. Table 1 summarizes the main characteristics of the two cohorts.

Table 2 Inter-item correlation matrix and Cronbach's alpha

	q 0	q 1	q 2	q 3	q 4	q 5
q 0	1.000	0.480	0.214	0.253	0.137	0.137
q 1	0.480	1.000	0.485	0.453	0.324	0.109
q 2	0.214	0.485	1.000	0.811	0.748	0.202
q 3	0.253	0.453	0.811	1.000	0.728	0.180
q 4	0.137	0.324	0.748	0.728	1.000	0.123
q 5	0.137	0.109	0.202	0.180	0.123	1.000

Cronbach's Alpha = 0.784; Cronbach's Alpha Based on Standardized Items = 0.771 (N of Items 6)

Patients in Cohort 2 had a significantly lower BMI than those in Cohort 1. The prevalence of diabetes mellitus, dyslipidemia, hypertension and previous bariatric surgery was significantly higher in Cohort 1, whereas, in Cohort 2, previous pelvic surgery was more prevalent (Table 1). The proportion of postmenopausal women was not statistically different between groups; however, postmenopausal women in Cohort 2 more often reported the use of hormonal replacement therapy. In addition, a higher prevalence of psychiatric diseases, but not of use of psychoactive medications, was reported by subjects in Cohort 2. Among MHQ subscales, compulsive traits (MHQ-O) scored higher in Cohort 2.

FSDI-6 score was significantly higher in patients in Cohort 2, whereas no difference was detected between the two Cohorts when evaluating FSFI-6 score (Table 1). The proportion of subjects with FSFI-6 ≤ 19 , which is the threshold for suspecting FSD [13], was 53.5 % ($n = 61$) and 66.3 % ($n = 106$) in Cohort 1 and 2, respectively ($p = 0.033$).

The internal consistency of the two tests was first analyzed in Cohort 1. Table 2 reports the inter-item correlation matrix. Cronbach's alpha for FSDI-6 was 0.784, indicating a very high level of reliability.

ROC curve analysis was used to determine the cutoff scores for FSFI-6 (not shown) and FSDI-6 (Fig. 1) for discriminating Cohort 1 from Cohort 2. The estimated area under the ROC curve (AUC) for FSDI-6 was 0.657 ($p < 0.0001$, 95 % CI 0.584–0.730). Conversely, FSFI-6 had poor discriminatory ability, showing ROC values that were not significantly different from 0.5 (AUC = 0.552; $p = 0.170$, CI 0.48–0.63). With a threshold of 16.5, sensitivity and specificity were 70 and 59 %, respectively. For comparison, calculated sensitivity and specificity for the pre-specified FSFI-6 cutoff of 19 were 46.5 and 65 %, respectively. The proportion of subjects with FSDI-6 ≥ 16.5 was 29.9 ($n = 32$) and 59.4 % ($n = 95$) in Cohort 1 and 2, respectively ($p < 0.0001$).

When analyzed separately, subjects with FSDI ≥ 16.5 in Cohort 1 had a significantly higher BMI and prevalence of diabetes mellitus than the rest of the Cohort; they were more often postmenopausal and had been for a longer time,

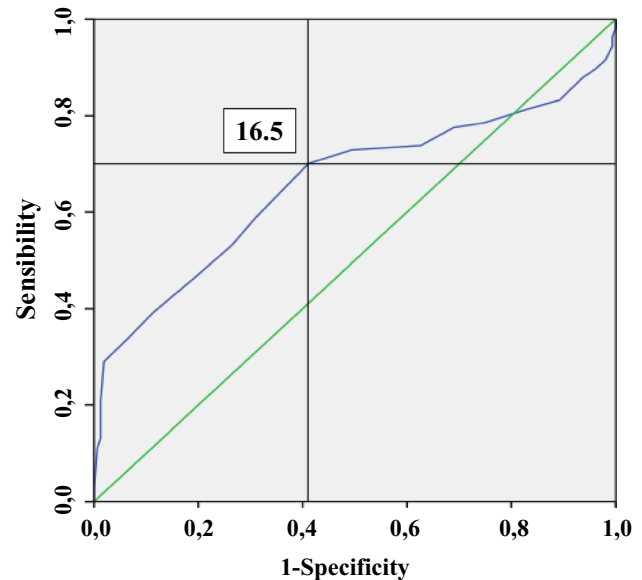


Fig. 1 Receiver operating characteristic curve for Female Sexual Dysfunction Index-6 (FSDI-6). A threshold of 16.5 was found to be the optimal cutoff value. The AUC is 0.657 [p (area = 0.5) < 0.0001 , 95 % CI 0.584–0.730]

and more often reported a history of surgical menopause and pelvic surgery (Table 3). Subjects with FSDI ≥ 16.5 also reported the use of psychoactive medications more frequently and, among MHQ subscales, they reached higher scores for free-floating anxiety and somatization than the rest of Cohort 1. Moreover, subjects with FSDI ≥ 16.5 in Cohort 1 had a significantly lower level of education.

In Cohort 2, an FSDI score ≥ 16.5 was significantly associated only with higher histrionic/hysterical traits as detected by MHQ; no other associations with the parameters evaluated were found (Table 3).

Among subjects with FSDI ≥ 16.5 , those from Cohort 2 (referring for sexual disorder) had been postmenopausal for fewer years and had a higher level of education than those in Cohort 1 (referring for other reasons); among comorbidities, subjects from Cohort 2 had a lower BMI, a lower prevalence of diabetes mellitus, dyslipidemia, hypertension and history of bariatric surgery (Table 3).

Table 3 Characteristics of the two cohorts

	Cohort 1 (n = 120)			Cohort 2 (n = 160)		
	FSDI-6 score ≥16.5 (n = 32)	FSDI-6 score <16.5 (n = 75)	p	FSDI-6 score ≥16.5 (n = 95)	FSDI score <16.5 (n = 65)	p
Age (years)	49.78 ± 11.78	46.24 ± 9.47	NS	46.15 ± 12.14	45.8 ± 12.44	NS
BMI (kg/m ²)	33.35 ± 9.36	29.34 ± 7.53	0.050	25.78 ± 6.94**	26.93 ± 6.61	NS
Years of education	9.73 ± 3.83	14.44 ± 3.94	<0.0001	11.72 ± 4.13*	12.13 ± 4.04	NS
Menopausal (%)	62.5 (n = 20)	40 (n = 30)	0.033	45.6 (n = 41)	41.3 (n = 26)	NS
Age at menopause (years)	48.84 ± 4.37	50.21 ± 3.53	NS	49.24 ± 4.93	48.23 ± 4.82	NS
Years since menopause	11.95 ± 7.18	7.29 ± 5.52	0.023	7.71 ± 5.77*	8.88 ± 6.98	NS
Hormonal replacement therapy (%)	5 (n = 1)	0 (n = 0)	NS	17.1 (n = 7)	3.8 (n = 1)	NS
History of surgical menopause (%)	20 (n = 4)	0 (n = 0)	0.011	4.9 (n = 2)	7.7 (n = 2)	NS
History of breast surgery (%)	0 (n = 0)	5.3 (n = 4)	NS	5.3 (n = 5)	10.9 (n = 7)	NS
History of pelvic surgery (%)	28.1 (n = 9)	9.3 (n = 7)	0.013	36.2 (n = 34)	40.6 (n = 26)	NS
History of bariatric surgery (%)	31.3 (n = 10)	30.7 (n = 23)	NS	0 (n = 0)**	0 (n = 0)	NS
Diabetes mellitus (%)	59.4 (n = 19)	38.7 (n = 29)	0.049	6.4 (n = 6)**	6.3 (n = 4)	NS
Dyslipidemia (%)	34.4 (n = 11)	22.7 (n = 17)	NS	13.8 (n = 13)*	12.5 (n = 8)	NS
Hypertension (%)	46.9 (n = 15)	30.7 (n = 23)	NS	13.8 (n = 13)**	9.4 (n = 6)	NS
Psychiatric diseases (%)	28.1 (n = 9)	13.3 (n = 10)	NS	29.8 (n = 28)	27.7 (n = 18)	NS
Reported psychoactive medications (%)	31.3 (n = 10)	13.3 (n = 10)	0.030	22.1 (n = 21)	21.5 (n = 14)	NS
Oral contraceptives (%)	8.3 (n = 1)	11.1 (n = 5)	NS	18.4 (n = 9)	13.5 (n = 5)	NS
Intrapsychic parameters as derived by MHQ-questionnaire						
MHQ-A score (free-floating anxiety symptoms)	9 [0–14]	6 [0–14]	<0.0001	8 [1–15]	6 [0–15]	NS
MHQ-P score (phobic anxiety symptoms)	7 [2–12]	5 [0–14]	NS	6 [2–14]	5 [1–12]	NS
MHQ-O score (obsessive–compulsive traits and symptoms)	6 [2–11]	4.5 [0–15]	NS	7 [0–14]	7 [1–14]	NS
MHQ-S score (somatized anxiety symptoms)	7 [0–10]	3 [0–13]	<0.0001	6 [0–15]	5 [0–13]	NS
MHQ-D score (depressive symptoms)	6 [2–14]	5 [0–13]	NS	6 [0–14]	6 [0–15]	NS
MHQ-H score (hysterical symptoms and traits)	5 [0–13]	5 [1–11]	NS	6 [0–12]	5 [1–15]	0.043

Data are expressed as mean ± SD when normally distributed, median [quartiles] when not normally distributed, and percentages when categorical. *p* in the right columns refer to differences in the investigated parameters between patients with FSDI-6 score ≥16.5 as compared with patients with FSDI-6 score <16.5 in the relative cohort. Asterisks refer to differences (*p* values) in the investigated parameters in patients with FSDI-6 score ≥16.5 in cohort 2 as compared with patients with FSDI-6 score ≥16.5 in cohort 1

FSDI-6 Female Sexual Dysfunction Index-6, BMI Body Mass Index, MHQ Middlesex Hospital Questionnaire

* *p* < 0.05; ** *p* < 0.0001

Discussion

In this study, we provide evidence that FSDI-6 is a valuable tool for a first-line recognition of FSD and for a quick identification of potentially affected women. The ROC analysis showed a sensitivity and specificity of 70 and 59 %, respectively, for a threshold of 16.5, with a higher accuracy

as compared to the original, previous version [13]. We here suggest that this improvement results from the few, but significant, changes made to the questionnaire, which aimed to balance the relative weight assigned to the different domains of FSD. Indeed, the excessive focus on genital arousal is reduced in the new version of FSFI-6 (FSDI-6), since this information is covered by the item related to lubrication. In addition, in the new DSM-5, arousal

disorders are abridged as a separate, definite entity and they are clustered with desire disorders [15]; in fact, arousal and desire are not distinct phases of sexual response and are not experienced as such by women themselves. Hence, FSDI-6 is more timely associated with the updated diagnostic definition, providing a simple, yet accurate, basic assessment of FSD, without losing the original advantage of fast and easy compilation. The other main innovation of FSDI-6 consists in adding an evaluation of FSD-related distress, performed through a question inquiring about one's own interest in having a satisfying sexual life. As it has been reported in other psychopathological areas [19], similar sexual symptoms may affect differently quality of life of individual subjects, depending on the person's values, beliefs and expectations. Hence, in a screening context all the more, investigating the relevance of the symptom could be as important as investigating the symptom itself.

The discriminatory ability found for FSDI-6 was good, but not excellent; this could be explained with the fact that we compared subjects consulting for FSD with subjects visited at a Diabetes clinic for metabolic disorders and, therefore, potentially enriched with sexual problems. However, FSDI-6 can be considered a useful screening tool to be used in general practice, for instance in the initial phase of the diagnostic process, in order to disclose potentially hidden sexual symptoms.

Among the many factors which contribute to making FSD a still poorly studied and under-diagnosed condition, is the fact that, especially in some countries (such as Italy), the socio-cultural and religious context prevents women from seeking medical attention for sexual symptoms. Besides, the preconception that female sexuality is made up of exclusively relational and psychological elements is still pervasive, particularly in the female population [20]. These issues, along with the multidimensionality of the disorder, the relevance of ethnic differences and the lack of universally accepted diagnostic procedures, have resulted in a poor number of data establishing worldwide prevalence and risk factors for FSD [21, 22].

In this context, our analysis offers some interesting insights about demographic and clinical characteristics of subjects diagnosed with FSD according to FSDI-6 and, in particular, not consulting for sexual problems. Quite surprisingly, the literature is not unanimous in identifying a direct correlation between obesity and FSD [23–26]. We found that, in the presence of FSD, women with a lower BMI seem to refer more frequently, even though a higher BMI is associated with FSD. This could be due to the fact that subjects with a lower BMI are more confident in solving their problem and, therefore, more frequently seek medical care for their sexual difficulties. We also found that diabetes mellitus is a predictor for lack of referral, even if significantly associated with FSD (see [27, 28] and present

study). Similarly, subjects suffering from hypertension or with a medical history of bariatric surgery were more likely to have FSD, but also to refrain from referring. Therefore, among sexually dysfunctional patients, those generally healthier (in particular, less frequently affected by diabetes, hypertension and obesity previously requiring bariatric surgery) more often sought specialist medical attention for their sexual problems. It can be speculated that patients suffering from chronic disabling diseases are much more concerned about these conditions and consequently less interested in sexual well-being.

It has been reported that FSD affects about 50 % of postmenopausal women [29]. The analysis of our non-referral Cohort revealed that the prevalence of menopause was significantly higher in patients with pathological FSDI-6, as compared with non-pathological ones in the same group; however, among dysfunctional women, those consulting our clinic for sexual problems showed the same prevalence of menopause, even if it was associated with a shorter average length, as compared with the non-referral group. This is tantamount to say that, as is well known, menopause negatively affects sexuality; at the same time, menopause-associated FSD remains often undetected and unreported. In line with previous findings [30, 31], we found that pelvic surgery and surgical menopause are associated with a higher prevalence of FSD, but subjects who previously underwent these procedures are not prone to seeking medical attention, despite being affected by its negative consequences on sexuality. This could be explained by a perception of the side effects of surgery on sexual function as definitive.

In agreement with previous epidemiological studies [2, 32, 33], lower educational status was positively associated with the presence of FSD. Interestingly, we also found that it was correlated with a lack of referral. A lower level of education might mirror a poor sociocultural and economic context and, also, both emotionally and sexually unsatisfactory relationship. Furthermore, less educated subjects affected by FSD probably might not recognize sexual health as a priority for their wellbeing.

It has been widely reported that both male and female sexual dysfunctions are potential side effects of psychotropic drugs, in particular antidepressants and antipsychotics, but also of anxiolytics and mood stabilizers (see [34–36] for review). When we evaluated some psychological parameters in women not consulting for sexual symptoms, higher levels of free-floating anxiety and somatization and a wider use of psychoactive medications were associated with FSD. However, these conditions do not seem to be a reason for accessing healthcare services for FSD.

Finally, when patients consulting for FSD were analyzed separately according to their FSDI-6 score, we did not find any significant difference in the investigated parameters

with the exception of hysterical symptoms, which showed a higher prevalence in dysfunctional versus non-dysfunctional subjects. Interestingly, the hysterical trait reflects the stereotype of women as vulnerable and emotionally unbalanced, being also characterized by intense longings for ideal love, capriciousness, sexual jealousy and sexualization. In addition, their self-centeredness and focus on sexual performance, a mirror of their own capacity, could be the reasons for seeking medical care for sexual difficulties [37].

The main limitations of the study lie in its observational nature, which does not allow for the defining of pathogenetic relationships, and in the small size of the samples, not sufficient to exclude the influence of some potential risk factors on FSD. In the future, we intend to evaluate the role of other reported risk factors for FSD, such as hormonal parameters [38], in our sample.

In summary, the present study confirms the role of some known risk factors, such as lower educational level, overweight/obesity, menopause and chronic diseases and psychiatric disorders in determining FSD; however, the novelty of our findings is that the above-mentioned factors are often associated with, or directly determinant for, the failure in medical consultation for FSD.

In light of these conditions, we propose that FSDI-6 should be performed by health care providers in non-specialist settings to detect potential FSD, which otherwise could remain under-diagnosed.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study.

Appendix

See Table 4.

Table 4 Female Sexual Dysfunction Index-6 (FSDI-6)

	Extremely important (1)	Very important (2)	Important (3)	Not very important (4)	Not important at all (5)
1 How would you rate your interest in having an active sexual life?	Very high (1)	High (2)	Moderate (3)	Low (4)	Very low or none at all (5)
2 Over the past 4 weeks, how would you rate your level (degree) of sexual interest/desire?	Most times (1)	Sometimes (2)	A few times (3)	Almost never (4)	No sexual activity (5)
3 Over the past 4 weeks, how often did you become lubricated (“wet”) during sexual activity or intercourse?	Most times (1)	Sometimes (2)	A few times (3)	Almost never (4)	No sexual activity (5)
4 Over the past 4 weeks, when you had sexual stimulation or intercourse, how often did you reach orgasm?	Most times (1)	Sometimes (2)	A few times (3)	Almost never (4)	No sexual activity (5)
5 Over the past 4 weeks, how often did you experience discomfort or pain during vaginal penetration?	Most times (1)	Sometimes (2)	A few times (3)	Almost never (4)	Did not attempt penetration (5)
6 Over the past 4 weeks, how satisfied have you been with your overall sexual life?	Very satisfied (1)	Moderately satisfied (2)	Equally satisfied and dissatisfied (3)	Moderately dissatisfied (4)	Very dissatisfied (5)

The FSDI-6 score is the sum of the ordinal responses to the six items; the score can range from 3 to 30

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