



Prevalence and factors associated with sexual dysfunction in Brazilian women: a cross-sectional study

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Received: 25 January 2023 / Accepted: 15 April 2023 / Published online: 24 May 2023
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Abstract

Introduction and hypothesis Changes in the mechanisms that modulate sexual response can contribute to the development of female sexual dysfunction (FSD). Although the prevalence of FSD in Brazil has been established, its associated risk factors have not been thoroughly examined. This study aimed to determine the prevalence of FSD in Brazilian women and identify any factors that may be associated with its presence.

Methods This study used a cross-sectional design and included women aged 18 years or older who had engaged in sexual activity within the past four weeks. Participants completed the Female Sexual Function Index (FSFI) and a sociodemographic and health questionnaire. Two groups were created based on FSFI scores: those with risk for FSD (score >26.55) and those without. The study used *t*-tests for independent samples to compare quantitative variables between the groups, and the chi-squared test, to compare categorical variables. Binomial logistic regression was used to test the association between sociodemographic and health variables and FSD.

Results FSD had a prevalence of 31.7% (95% CI: 28.2%–35.5%). The results indicated that practice of physical activity was inversely associated with FSD (OR: 0.64, 95% CI: 0.45–0.92), whereas urinary incontinence (OR: 2.55, 95% CI: 1.68–3.87) and post-menopause (OR: 4.69, 95% CI: 1.66–13.3) were directly associated with FSD.

Conclusions A high prevalence of FSD was observed among Brazilian women in this study. Physically active women are less likely to have FSD. Menopause and the presence of urinary incontinence can negatively impact female sexual function.

Keywords Female sexual function · Female sexual dysfunction · Female sexual function index (FSFI) · Sexual health · Sexuality · Women's health

Introduction

According to the World Health Organization (WHO), sexual health is a state of physical, emotional, mental, and social well-being related to sexuality, which is considered an essential component of an individual's life [1]. Changes in the mechanisms that modulate female sexual response can lead to various types of female sexual dysfunction (FSD), such

as disorders of sexual interest or arousal, female orgasmic disorder, genito-pelvic pain on penetration, sexual dysfunction induced by medication or substance, as well as other specific or non-specific sexual dysfunctions [2].

The causes of FSD are multifaceted and may involve both biological and psychosocial factors. The prevalence of FSD may also vary [3]. Data on the factors that influence women's sexual health can be a valuable resource, as FSD can significantly affect self-esteem and interpersonal relationships, leading to decreased quality of life [4]. Despite extensive research on the prevalence of FSD and its relevant recent findings [5], the analysis of risk factors for these disorders remains limited on a global scale [6], including in the Brazilian population.

Wolpe et al. (2017) conducted a systematic review on the prevalence of FSD in Brazil and identified several limitations in the studies reviewed, including differences in sample characteristics (especially in terms of age, marital status, and

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underlying diseases) and the use of inadequate assessment instruments that made it difficult to achieve good internal consistency and interpret the results [7]. Based on this limitation, we propose to examine the prevalence of FSD, aiming to clarify the risk factors for FSD in Brazilian women, including age, education, marital status, practice of physical activity, smoking, parity, history of gynecological surgery, urinary incontinence (UI) and postmenopausal.

Materials and methods

Methodological design

This study used a cross-sectional design with a quantitative approach that collected data online. The study was approved by the Ethics Committee for Research on Human Beings of the Federal University of São Carlos (CAAE n° 27822120.7.0000.5504) and was conducted from May to September 2021.

Participants

Eligible participants for this study were women aged 18 years or older, living in Brazil, literate, with internet access, and who reported having engaged in sexual activity in the past four weeks. Participants who did not fully complete the questionnaires were excluded from the study, as it was not possible to score the questionnaire without all of the required information. The sample was selected for convenience and recruited through the dissemination of the research on social media.

Sample size estimation

The sample size estimation was based on the regression analysis. According to Field (2009, p.222-223) for this type of analysis, the recommendation is to include at least 15 cases for each predictor [8]. In our study, we have seven predictors (age, married, pregnancies, use of contraceptive method, practices physical activity, urinary incontinence and post-menopause), then the minimum required sample size is 105 cases.

Measurement of study variables

To examine the prevalence of FSD and its associated factors in Brazilian women, we administered the following questionnaires via the Google Forms platform:

First, we prepared a sociodemographic and health questionnaire that included items on personal, social, and demographic data, as well as general health information, such as life habits and sexual, obstetric, and gynecological history. These items were primarily evaluated using dichotomous responses of “yes” for the presence of the alteration or symptom and “no” for its absence. To investigate the practice of physical activity,

the following question was asked: "Do you practice physical activity such as walking, running, pilates, yoga, cycling, swimming, gym, among others?". According to the literature, several factors may be associated with FSD, including age [9], marital status [10], number of pregnancies [11], use of contraceptive methods [12], practice of physical activity [13], UI [14], and post-menopause [15].

Second, we adopted the Female Sexual Function Index (FSFI), an instrument developed to assess female sexual response that has been validated for Brazilian Portuguese populations. The FSFI consists of 19 items organized into six subscales that measure the domains desire, excitement, lubrication, orgasm, satisfaction, and pain (dyspareunia). Each domain is scored on a scale of 0 to 5, and the scores for all of the domains are added and corrected to obtain a total score for the FSFI, which ranges from 2 to 36. Higher scores indicate a higher level of female sexual function [16, 17]. In our study, we used the cutoff point ≤ 26.55 in the total score as a criterion to indicate FSD [18].

Data processing and analysis

The data were analyzed using descriptive statistics, including mean, standard deviation, absolute and relative frequency, and 95% confidence intervals. The sample was divided into two groups based on the cutoff point in the total FSFI score: those with risk for FSD (score >26.55) and those without¹⁷. The two groups were compared for sociodemographic characteristics using the *t*-test for independent samples (for continuous variables) and the chi-squared test (for categorical variables).

We examined the association between the presence of FSD and characteristics of the participants using binomial logistic regression analysis, with FSD as the dependent variable (present or absent) and factors from the literature that may be associated with FSD as independent variables. The independent variables were included separately in a univariate analysis and also in a multivariate model, which included all significant variables from the univariate analysis. The data were analyzed using IBM SPSS Statistics for Windows, version 22.0, and a significance level of 5% was used.

Results

Participants

The study included 621 women with a mean age of 29.8 years (SD: 8.9). The flow of the participants is presented in Fig. 1. The other characteristics are presented in Table 1.

Outcome data

Approximately 12% of the women ($n = 76$) reported smoking, and 58% ($n = 362$) reported practicing physical activity.

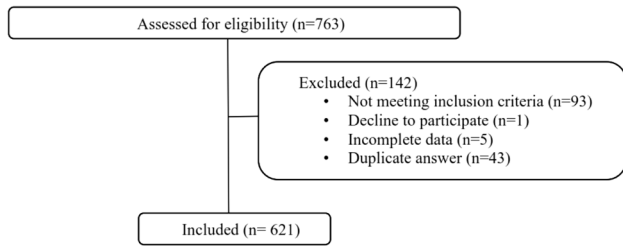


Fig. 1 Data collection flowchart

Women who did not practice physical activity had a higher concentration in the group with FSD (n = 99, 50.3%) compared with the group without FSD (n = 263, 62.0%; p = 0.01). Among the evaluated women, 28 (4.5%) reported being post-menopausal, and of them, 16 (8.1%) had FSD (p <0.01). A higher proportion of women in the group with sexual dysfunction reported having UI, including urgent UI (UUI) is the complaint of involuntary leakage accompanied preceded by urgency (n = 85, 43.1%, p <0.01) and stress UI (SUI) is the complaint of involuntary leakage on effort, or on sneezing or coughing (n = 65, 33.0%, p <0.01). Among women without FSD, both UUI (n = 103, 24.3%) and SUI (n = 92, 21.7%) were less common. The other characteristics are presented in Table 2.

Main results

The results of the univariate and multivariate logistic regression analyses, presented in Table 3, indicated that pregnancy, practice of physical activity, UI, and menopause were associated with risk for FSD in the univariate model. In the multivariate model, the variables that remained significantly associated with FSD were practice of physical activity, UI, and menopause. The practice of physical activity was inversely associated with risk for FSD (OR: 0.64, 95% CI: 0.45–0.92). Meanwhile, both UI and post-menopause were found to be

directly associated with risk for FSD (OR: 2.55; 95% CI: 1.68–3.87 and OR: 4.69; 95% CI: 1.66–13.3, respectively).

Discussion

The study found a high prevalence of FSD in Brazilian women, with an inverse association between physical activity and the development of FSD. Furthermore, the presence of UI and post-menopause were found to increase the likelihood of FSD by 2.5 and 4.6 times, respectively.

Risk factors associated with FSD include biological components, such as gynecological interventions and/or surgeries, puerperium, menopause genitourinary syndrome, endometriosis, polycystic ovary syndrome, and SUI; psychological components, such as anxiety and depression disorders, negative sexual attitudes, history of sexual violence and/or intimate partner violence, stress, and psychological sequelae of gynecological or breast cancers; and contextual components, such as ethnic and religious issues or the presence or absence of a support network [19, 20]. Many of these factors not only increase the risk of developing FSD but also exacerbate it [20].

Other cross-sectional studies, such as Dabrowska et al.’s (2010) study of 336 healthy perimenopausal Polish women aged 45–55 years, have found that active women have a lower tendency to develop FSD and have higher FSFI scores [21]. These findings are consistent with those of the present study. Esposito et al. (2010) evaluated a sample of 595 Italian women aged 35–70 years with type 2 diabetes using FSFI and found that the benefits of physical activity also extend to women with FSD, acting as a protective and modulating factor with respect to its development [22]. Moreover, one of the mechanisms by which physical activity may reduce the impact of FSD is its positive effect on self-esteem [23, 24].

UI can also have a negative impact on the quality of life and sexual function of women owing to social discomfort and

Table 1 Characterization of the participants. Data are presented in absolute and relative frequency [n (%)], unless otherwise indicated

Characteristic	Total (n = 621)	Without risk for sexual dysfunction (n = 424)	With risk for sexual dysfunction (n = 197)	P
Age, years [mean (SD)]	29.8 (8.9)	29.5 (8.6)	30.5 (9.3)	0.17
Occupation				0.40
Does not engage in paid work	191 (31.7)	130 (30.7)	67 (34.0)	
Engages in paid work	424 (68.3)	294 (69.3)	130 (66.0)	
Education				0.39
Elementary school	6 (1.0)	3 (0.7)	3 (1.5)	
High school	107 (17.2)	68 (16.0)	39 (19.8)	
Higher education	305 (49.1)	216 (50.9)	89 (45.2)	
Postgraduate studies	203 (32.7)	137 (32.3)	66 (33.5)	
Marital status				0.05
Not married	347 (55.9)	248 (58.5)	99 (50.3)	
Married	274 (44.1)	176 (41.5)	98 (49.7)	

Table 2 Participants' characteristics regarding health information. Data are presented in absolute and relative frequency [n(%)], unless otherwise indicated

Characteristic	Total (n = 621)	Without risk for sexual dysfunction (n = 424)	With risk for sexual dysfunction (n = 197)	P
Practices physical activity	362 (58.3)	263 (62.0)	99 (50.3)	0.01
Smoking	76 (12.2)	53 (12.5)	23 (11.7)	0.77
Use of contraceptive method	461 (74.2)	322 (75.9)	139 (70.6)	0.15
Undergone gynecological surgery	77 (12.4)	47 (11.1)	30 (15.2)	0.14
Urinary incontinence	237 (38.2)	135 (31.8)	102 (51.8)	<0.01
Urgent urinary incontinence	188 (30.3)	103 (24.3)	85 (43.1)	<0.01
Stress urinary incontinence	157 (25.3)	92 (21.7)	65 (33.0)	0.01
Menopause	28 (4.5)	12 (2.8)	16 (8.1)	0.01
Pregnancies				0.08
None	374 (60.2)	267 (63.0)	107 (54.3)	
1	111 (17.9)	67 (15.8)	44 (22.3)	
2 or more	136 (21.9)	90 (21.2)	46 (23.4)	

the psychological effects on self-esteem and self-image [25]. Women with UI may experience reduced libido, hypoorgasmia, and decreased vaginal lubrication, which may lead them to avoid sexual activity owing to these symptoms and the possibility of experiencing urine loss during sex²⁴. The fear of urine loss in women with UI can also lead to a resignation toward sexual activity, disrupting female sexuality and leading to feelings of loss of femininity and functionality in society [26].

The present study has limitations that must be considered. Due to the cross-sectional design, it is not possible to establish a causal relationship between the dependent and independent variables. Participants' physical activity levels were investigated using a simple question and the use of social media for dissemination may explain the higher prevalence among young women and a small sample of older women. In addition, given the territorial dimension and the differences found in Brazil, the poor population without access to the internet may not be represented in the study. Thus, future studies are suggested that include different regions of Brazil, different levels of education and with women who may not have access to the internet.

The finding that post-menopause is associated with FSD is consistent with previous research, which has identified post-menopause as an exacerbating factor and shown that symptoms of hypoestrogenism can occur during the transition between the reproductive period and menopause, as well as the development of FSD [15, 21, 26]. Given that hypoestrogenism is responsible for the development of the genitourinary syndrome of menopause, which affects the genital system and lower urinary tract, it may have a negative impact on the sexual response of post-menopausal women⁶. During the menopausal transition, women may experience mood swings, depression, reduced libido, anxiety, decreased sleep quality, amenorrhea, hot flashes, and changes in the genital system, such as vulvar and vaginal atrophy and vaginal dryness [27].

The concurrent presence of aging and menopause also has a significant impact on the pelvic floor [28], which undergoes a process of weakening owing to aging and may be exacerbated by the suppression of estrogen, as this hormone is linked to the physiological action of pelvic floor muscles and collagen synthesis, which affects the physiology and functionality of the pelvic region [29].

Table 3 Logistic regression analysis results for the association between presence of risk for sexual dysfunction and associated factors

Factors	Univariate		Multivariate	
	OR (95% CI)	P	OR (95% CI)	P
Age	1.01 (0.99–1.03)	0.17	0.98 (0.94–1.01)	0.16
Married	1.40 (0.99–1.96)	0.06	1.43 (0.90–2.27)	0.14
Pregnancies				
None	–	0.08	–	0.33
1	1.64 (1.05–2.55)	0.03	1.41 (0.81–2.46)	0.23
2 or more	1.28 (0.84–1.94)	0.26	0.97 (0.52–1.83)	0.93
Use of contraceptive method	0.76 (0.52–1.11)	0.15	0.95 (0.61–1.48)	0.83
Practices physical activity	0.62 (0.44–0.87)	<0.01	0.64 (0.45–0.92)	0.01
Urinary incontinence	2.30 (1.63–3.25)	<0.01	2.55 (1.68–3.87)	<0.01
Post-menopause	3.04 (1.41–6.55)	0.01	4.69 (1.66–13.3)	<0.01

Conclusion

Our results indicated a high prevalence FSD in young Brazilian women and highlighted the association between UI and menopause with an increased likelihood of developing FSD. Meanwhile, physical activity was found to be associated with a lower likelihood of FSD. These findings can be incorporated in the care of women, particularly in national health policies related to sexual function, to raise awareness, promote and prevent conditions that affect female sexual health, and facilitate early diagnosis and treatment.

Acknowledgments The authors thank the Fundação de Amparo à Pesquisa do Estado de São Paulo (Process 2019/14666-7) for funding the study, as well as the Federal University of São Carlos (UFSCar) and the University Hospital of UFSCar managed by Empresa Brasileira de Serviços Hospitalares for their support in the development of the study and authorization for data collection. Finally, we thank the participants who made this study possible.

Authors' contribution Fabricio AMF: Project development, Data Collection, Manuscript writing.

Sato TO: Formal analysis, Manuscript review.

Silva SG: Project development, Data Collection, Manuscript writing.

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Souza DPR: Manuscript review.

Driusso P: Project development, Manuscript review.

Beleza ACS: Project development, Manuscript writing and review.

Funding The authors thank the Fundação de Amparo à Pesquisa do Estado de São Paulo (Process 2019/14666-7). The funders did not have any role in the study design, data collection and analysis, manuscript preparation, or publication decision.

Declarations

Conflicts of interest None.

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