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Female sexual dysfunctions: prevalence and related factors in a sample of young university women – a cross-sectional study

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ABSTRACT

This study aims to evaluate the prevalence of female sexual dysfunctions (FSD) and associated factors in young women attending a healthcare degree course. Sexual function and sexual discomfort of 187 young college women were assessed by The Female Sexual Function Index (FSFI) and the Female Sexual Distress Scale-Revised (FSDS-R). A total of 23% of participants reported FSD, and the most affected area was pain, followed by orgasm and lubrication, arousal, desire, and satisfaction. This study provides valuable insights into the sexual behavior of young women in Brazil, including the number of lifetime sexual partners, duration of relationships, type of sexual activities and their frequency, sexual orientation, use of anti-depressant, and contraceptives methods.

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Female sexual dysfunction; sexuality; sexual behavior; sexual experience

Introduction

Female sexual dysfunction (FSD) is a group of disorders involving the sexual response cycle, sometimes characterized by pain during intercourse (Lara et al., 2008; Althof & Needle 2013; Levin et al., 2016; Liu et al., 2016; Weinberger et al., 2019); this multifaceted problem hurts the quality of life of women affected and their interpersonal relationships (Bortolami et al., 2015; Nappi et al., 2016). Sexual wellbeing is currently considered an integral part of reproduction and as a fundamental human right for women's health (Faubion & Rullo, 2015; Khajehei et al., 2015; Rehman et al., 2015).

FSD is a common problem affecting women of all ages (Peixoto et al., 2016; Alvisi et al., 2014; Baldassarre et al., 2016; Moreau et al., 2016), with data reporting that as many as 50% have had or will have at least one episode of sexual dysfunction

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(Bortolami et al., 2015; Khera, 2015). This condition is characterized by persistent disturbances in one or more phases of the sexual response cycle (desire, arousal and plateau, orgasm and resolution), possibly due to different factors such as age, anatomical and/or neurological factors, hormonal status, urinary dysfunction, drug use, psychological factors, and sociocultural factors (*i.e.*, ethnicity and religion) (Barbara et al., 2016; Caruso et al., 2010; Khajehei et al., 2015; Su et al., 2015; Vitale et al., 2016; Vitale, Caruso et al., 2018; Vitale, Laganà et al., 2018). Despite the high prevalence of FSD, the issue still needs to be better elucidated (Filocamo et al., 2014; Levin et al., 2016).

Although FSDs are directly related to the quality of life, the early evaluation of possible alterations of the sexual sphere has been poorly approached. Therefore, the primary objective of this study was to evaluate the prevalence of sexual dysfunction in young women and, as a secondary objective, to investigate the sociodemographic aspects that may potentially be associated with FSD among young college women.

Methods

Study design

An observational, cross-sectional study was carried out between February and March 2016 at the University of Santa Cruz do Sul with a sample of college-aged women and was approved by the Committee of Ethics in Scientific Research of [omission for peer review]. The study was designed according to the Helsinki Declaration and the Committee on Publication Ethics (COPE) guidelines. The design, analysis, interpretation of data, drafting and revisions followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: guidelines for reporting observational studies, available at the EQUATOR (Enhancing the Quality and Transparency Of Health Research) network.

The sample consisted of young college female students and academics of a health-care degree course, who volunteered to participate in the research project after providing their voluntary informed consent. Sexually inactive women were excluded, as were those who did not answer three or more questions per each domain of the questionnaires. The final sample size hence dropped from $n = 200$ to $n = 187$.

A specific form was used to evaluate sociodemographic characteristics: age, sexual orientation, marital status, partner's age, marital age, number of children, gestations, gestational state, type of delivery (*i.e.*, vaginal vs. cesarean), number of people sharing the same house, contraceptive use, use hormone replacement therapy and of psychopharmacological treatments.

The participants responded to the Female Sexual Function Index (FSFI) questionnaire (Thiel et al., 2008), to verify the prevalence of sexual dysfunctions. Based on the results, the women were stratified into two groups: those with FSD ($n = 43$) and without FSD ($n = 144$). The female sexual discomfort was evaluated through The Female Sexual Distress Scale-Revised (FSDS-R) (Carpenter et al., 2015; Limoncin et al., 2013).

Female sexual function index (FSFI)

The FSFI is a universal validated questionnaire, created in 2000, to evaluate female sexual function through multidimensional self-reporting (Caruso et al., 2018; Laganà et al., 2018; Rosen et al., 2000; Vitale et al., 2018). It was validated in the Portuguese language by Thiel et al. and culturally adapted (Thiel et al., 2008). Its appropriateness has been assessed through psychometric evaluation, reliability, convergence and discrimination tests, and it was translated into several languages, including Dutch, Malay, Chinese, Japanese, and Iranian (Wright & O'Connor, 2015). The questionnaire consists of 19 questions about sexual activity concerning the last four weeks, and evaluates six domains (desire, arousal, lubrication, orgasm, satisfaction, and pain). Based on the instructions provided by the authors who validated this questionnaire, the total score ranges from 0 to 36 with 26.55 considered as a significant cut off indicating the presence of FSD (Rosen et al., 2000; Thiel et al., 2008; Wiegel et al., 2005). The authors also established cut-off points for each specific domain: Desire: 4.28; Excitation 5.08; Lubrication 5.45; Orgasm: 5.05; Satisfaction: 5.04 and Pain: 5.51 (Rosen et al., 2000).

Female sexual distress Scale-Revised (FSDS-R)

According to Carpenter et al., the FSDS-R aims to associate psychosocial factors with changes in sexual function, producing a more comprehensive evaluation and more complete and targeted diagnosis and treatments (Carpenter et al., 2015). It was reviewed in 2008 and developed to provide a standardized and quantitative measure of sexually related personal distress in women (Derogatis et al., 2008; Derogatis et al., 2002). The FSDS-R consists of 13 items, and the woman has to classify each item according to its frequency (0 – never, 1 – rarely, 2 – sometimes, 3 – quite, 4 – always). These items are summed and provide a final score that can range from 0 to 52, with a cutoff point that was established being 11 or more (Carpenter et al., 2015; Derogatis et al., 2008).

Statistical analysis

The sample has been described using descriptive statistics; quantitative variables have been presented by mean and standard deviation and qualitative variables have been summarized with absolute and percentage frequencies. The prevalence of FSD has been calculated as the percentage of participants scoring less than 26.55 at the FSFI test. Comparisons between women with FSD and women without FSD have been performed using the Fisher Exact test for categorical variables, the T-test for continuous and normal variables and the Mann Whitney test for continuous and non-normal variables. FSFI global score and domain sub-scores have been calculated by groups and described through minimum, maximum, mean, standard deviation, and median. Comparisons between the prevalence of the dysfunction in a specific domain by groups have been calculated using the Chi-squared test.

To evaluate the existence of sexual dysfunctions predictive factors, a logistic regression has been performed considering the following factors (sociodemographic

Table 1. Descriptive statistics of the main socio-demographic variables.

Variables	
Participants' age	22.44 ± 3.88
Participants partners' age	24.75 ± 5.2
Sexual orientation	
<i>Heterosexual</i>	179 (95.7)
<i>Homosexual</i>	1 (0.5)
<i>Bisexual</i>	6 (3.2)
Marital status	
<i>Single</i>	136 (72.7)
<i>Stable union</i>	38 (20.3)
<i>Married</i>	12 (6.4)
<i>Divorced</i>	1 (0.5)
Time in years with partner	4.02 ± 3.12
Number of children	0.09 ± 0.4
Number of pregnancies	0.10 ± 0.4
Number of vaginal deliveries	0.04 ± 0.26
Number of Cesarean deliveries	0.12 ± 0.5
Age of the youngest child	5.33 ± 4.1
Number of people sharing the house	3 ± 1.2
Number of partners	4.03 ± 4.3
Contraceptive method	
<i>Oral contraceptive</i>	120 (64.2)
<i>condom</i>	56 (29.9)
<i>none</i>	7 (3.7)
<i>injectable contraceptive</i>	4 (2.1)
Hormonal replacement	
<i>No</i>	184 (98.4)
<i>Yes</i>	2 (1.1)
<i>Others</i>	1 (0.5)
Antidepressant use	
<i>No</i>	174 (93.0)
<i>Yes</i>	13 (7.0)
Presence of FSD	
<i>No</i>	144 (77.0)
<i>Yes</i>	43 (23.0)

Data are expressed as mean ± standard deviation or frequencies (percentages).

variables): sexual orientation, participant's age, marital status, partner's age, duration (in years) of the relation, number of children, number of pregnancies, number of vaginal deliveries and number of cesarean deliveries, use of contraceptives, hormonal replacement and use of antidepressants.

All the participants' replied to the Female Sexual Distress Scale-Revised (FSDS-R) questionnaire, and the final score has been evaluated, firstly on the entire sample and secondly on the FSD group and the NO-FSD group. The comparison has been made using the Mann-Whitney U test.

Statistical analysis has been performed with SPSS (Version 25.0. Armonk, NY: IBM Corp.).

Results

A total of 200 women completed the questionnaire with 13 excluded for sexual inactiveness in the previous four weeks. Participants' mean age is 22.44 ± 3.88, and participants' partners' age is 24.75 ± 5.2. The majority (95.7%) of participants are heterosexual and single (72.7%). The contraceptive most used method is the oral one (64.2%). Only 7% of participants use antidepressants. FSFI scores had a minimum

Table 2. Comparisons between women with FSD and women without FSD.

Variables	Without FSD	With FSD	p-value
Participants' age	22.6 ± 4	21.67 ± 3.16	0.15
Participants partners' age	25.1 ± 5.3	23.55 ± 4.5	0.115
Sexual orientation			0.72
<i>Heterosexual</i>	96.5	95.3	
<i>Homosexual</i>	0.7	0	
<i>Bisexual</i>	2.8	4.7	
Marital status			0.374
<i>Single</i>	72.9	72.1	
<i>Stable union</i>	21.5	16.3	
<i>Married</i>	4.9	11.6	
<i>Divorced</i>	0.7	0	
Time in years with partner	4.1 ± 3.2	3.77 ± 2.7	0.762
Number of children	0.10 ± 0.42	0.05 ± 0.2	0.637
Number of pregnancies	0.12 ± 0.44	0.05 ± 0.2	0.381
Number of vaginal deliveries	0.04 ± 0.3	0.03 ± 0.15	0.95
Number of Cesarean deliveries	0.12 ± 0.446	0.15 ± 0.66	0.868
Age of the youngest child	4.6 ± 4.17	9 ± 0.0001	0.121
Number of people sharing the house	3.03 ± 1.15	2.88 ± 1.3	0.251
Number of partners	4.16 ± 4.7	3.59 ± 2.25	0.675
Contraceptive method			0.533
<i>Oral contraceptive</i>			
<i>condom</i>	61.8	72.1	
<i>none</i>	32.6	20.9	
<i>injectable contraceptive</i>	3.5	4.7	
Hormonal replacement	2.1	2.3	
<i>No</i>	98.6	97.7	0.139
<i>Yes</i>	1.4	0	
<i>Others</i>	0	2.3	
Antidepressant use			0.994
<i>No</i>	93.1	93	
<i>Yes</i>	6.9	7	

Data are expressed as mean ± standard deviation or as percentages.

value equal to 20.80, a maximum of 35.70, a mean value of 29.13 and a standard deviation of 3.25. The prevalence of FSD is 23% and two groups have been created, the one with women affected by FSD (N = 43) and the one with women not affected by FSD (N = 144) (Table 1). The comparison of women with FSD and women without FSD did not highlight any significant difference between the two groups (Table 2).

The FSFI score domains are described in Table 3. Women in the FSD group also present the highest prevalence of dysfunctions in each domain. The significance of each p-value is hence an expected result. All the measures presented in Table 3 are smaller in the FSD group than in the no-FSD group, as expected.

The evaluation of the existence of sexual dysfunctions predictive factors (logistic regression) did not highlight any significant results for the considered variables (see methods paragraph for details).

FSDS-R score on the entire sample has the following main descriptive measures: min = 0, Max = 30, mean = 5.59 and standard deviation = 6.4. According to the FSDS-R cut-off, 156 women (83.4%) presented distress and 31 women (16.6%) did not. The comparison between scores in the FSD group versus scores in the no-FSD group did not highlight a statistically significant difference between the two groups (p = 0.104). Table 4 highlights that 20 women (10.7%) are in the NO-FSD group but present some distress and 32 women (17.1%) are in the FSD group but did not

Table 3. Prevalence of dysfunction in each dimension by group and main descriptive measures. P-value of the comparison between groups.

		Dimension desire score	Dimension excitation score	Dimension lubrification score	Dimension orgasm score	Dimension satisfaction score	Dimension pain score
no FSD	Prevalence	48.6%	38.2%	59.0%	50.7%	21.5%	49.3%
	Min	3.0	3.3	3.3	1.2	2.8	2.0
	Max	6.0	6.0	6.0	6.0	6.4	6.0
	Median	4.8	5.1	5.4	4.8	5.6	5.6
	Mean	4.5	5.0	5.3	4.9	5.5	5.2
	Standard deviation	0.8	0.6	0.6	0.9	0.6	0.8
FSD	Prevalence	88.4%	90.7%	93.0%	93.0%	58.1%	97.7%
	Min	2.4	2.7	2.7	1.2	2.0	1.6
	Max	5.4	6.0	6.0	5.2	6.0	6.0
	Median	3.6	3.9	4.5	3.6	4.8	4.0
	Mean	3.8	4.1	4.6	3.6	4.6	4.0
	Standard deviation	0.6	0.7	0.7	1.0	1.0	0.8
	p-value	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Table 4. Prevalence of distress in FSD and no FSD groups.

		FSDS-R		Tot
		<11 (no distress)	≥11 (distress)	
FSFI	<26.55 (FSD)	32	11	144
	≥26.55 (no FSD)	124	20	43
	Tot	156	31	187

present any distress. The degree of affection in each domain, according to the FSDS-R score, is described in the [Table 5](#).

Discussion

The frequency of FSD in the young women participating in this study was 23%, with dyspareunia being the most affected domain and satisfaction the least affected, although all domains reported high percentages of dysfunction. The logistic regression did not highlight the existence of sexual dysfunction predictive factors in our sample.

Sexual function related problems are increasingly common in the young population. Other studies evaluated sexual function in young women using FSFI, showing a prevalence of 25.3% of FSD in nursing students in Brazil and of 21.7% in students of the same course in Italy (Bezeera et al., 2018). Another study with female medical students with a mean age of 23.5 years old found that 33.5% of respondents were at risk for FSD (Wallwiener et al., 2017). These data corroborated our findings and showed very high FSD rates.

Our study did not find predictive factors for FSD while other authors (Escajadillo-Vargas et al., 2011; Shindel et al., 2008; Wallwiener et al., 2016) that investigated female sexual function showed that women in a stable relationship had better rates of sexual function in contrast to our data. This data draws our attention to a young population, probably healthy and at the height of their sexual life, and to the consequences of these outcomes on interpersonal relationships of these women (Wallwiener et al., 2016).

Table 5. Degree of affection in each domain according to the FSDS-R score.

		Never	Rarely	Occasionally	Frequently	Always
1. Distressed about sex life	FSDS-R < 11 (no distress)	53.8	35.3	10.9	0	0
	FSDS-R ≥ 11 (distress)	0	29.0	64.5	6.5	0
2. Unhappy about sexual relationship	FSDS-R < 11 (no distress)	70.5	21.8	7.7	0	0
	FSDS-R ≥ 11 (distress)	6.5	35.5	48.4	9.7	0
3. Guilty about sexual difficulties	FSDS-R < 11 (no distress)	69.9	21.2	8.3	0.6	0
	FSDS-R ≥ 11 (distress)	6.5	22.6	45.2	22.6	3.2
4. Frustrated by sexual problems	FSDS-R < 11 (no distress)	80.8	16.7	1.9	0.6	0
	FSDS-R ≥ 11 (distress)	6.5	48.4	29.0	12.9	3.2
5. Stressed about sex	FSDS-R < 11 (no distress)	83.3	16.0	0.6	0	0
	FSDS-R ≥ 11 (distress)	19.4	32.3	38.7	9.7	0
6. Inferior because of sexual problems	FSDS-R < 11 (no distress)	90.4	8.3	1.3	0	0
	FSDS-R ≥ 11 (distress)	16.1	51.6	32.3	0	0
7. Worried about sex	FSDS-R < 11 (no distress)	67.9	23.7	7.7	0.6	0
	FSDS-R ≥ 11 (distress)	9.7	22.6	41.9	16.1	9.7
8. Sexually inadequate	FSDS-R < 11 (no distress)	87.2	10.3	2.6	0	0
	FSDS-R ≥ 11 (distress)	35.5	38.7	22.6	3.2	0
9. Regrets about sexuality	FSDS-R < 11 (no distress)	98.1	1.3	0.6	0	0
	FSDS-R ≥ 11 (distress)	67.7	25.8	6.5	0	0
10. Embarrassed about sexual problems	FSDS-R < 11 (no distress)	91.0	5.8	2.6	0.6	0
	FSDS-R ≥ 11 (distress)	48.4	32.3	16.1	0	3.2
11. Dissatisfied with sex life	FSDS-R < 11 (no distress)	71.2	20.5	7.1	1.3	0
	FSDS-R ≥ 11 (distress)	9.7	35.5	48.4	6.5	0
12. Angry about sex life	FSDS-R < 11 (no distress)	95.5	3.2	0.6	0	0.6
	FSDS-R ≥ 11 (distress)	51.6	25.8	22.6	0	0
13. Bothered by low sexual desire	FSDS-R < 11 (no distress)	83.3	9.6	5.1	1.9	0
	FSDS-R ≥ 11 (distress)	25.8	22.6	25.8	22.6	0

Data are expressed as percentages.

In this study, the pain was found to be the most common disorder, prevalent in 97.7% of the women classified with FSD, followed by disorders of orgasm and lubrication and excitation. This sequence of findings makes sense, thinking about the cycle of sexual response proposed by Basson (2015), which comprises phases of physiologic response and subjective experience; therefore, factors such as pain during intercourse will cause non-orgasm and decreased lubrication. Du et al. (2016) and Shindel et al. (2008) found similar results, according to which the most affected domains were pain followed by orgasm in young health student women. In a study with young Koreans(Choi et al., 2014), the orgasm domain was the third most affected, preceded by desire and satisfaction, which are the least affected in our study. This is probably due to cultural differences between these countries and because they evaluated young and middle-aged women.

In adult people, sexual distress is associated with low engagement in sexual activities, low self and partner's pleasure, depression, and poor communication(Hayes et al., 2008). Our study reported a total of 16.57% frequency of sexual discomfort in young university women, which is in line with the results of Aydin et al., who found a 12.5% prevalence of sexual distress in a population of Turkish women (Aydin et al., 2016). It is noteworthy that 25.58% of women with FSD reporting discomfort and 13.88% of those classified without dysfunctions had predictive scores of discomfort. In contrast, the study by Lo and Kok (2018) found that 61.8% of women with FSD had discomfort. For those without FSD, these findings corroborate ours with very similar percentages (10.9%). It is hard to make a perfect

comparison between our and this Chinese study because, despite their very similar study designs, cultural differences between populations are an essential factor to consider.

This study provides valuable insights into the sexual behavior of young women in Brazil, including the number of lifetime sexual partners, duration of their relationship, type of sexual activities and their frequency, sexual orientation, use of antidepressants, and contraceptives methods. Besides, it brings information about the discomfort, often neglected in this population, one time since it is present in 13.88% of the subjects of this research. This study helps to provide information about the sexual life of a university woman and psychosocial factors.

Study limitations include that our sample is restricted to health students only while young people in other areas may have less knowledge of sexuality health and higher rates of FSD. Another limitation is that the instrument used is useful only for women who were sexually active in the past four weeks, but the presence of sexual dysfunction can make it difficult to have sexual intercourse and therefore mask higher rates of FSD. Only one woman in the sample identified as lesbian, therefore our results may not be inclusive of women who hold non-heterosexual orientations .

In conclusion, our study represents a valid contribution to the understanding of FSD-related factors in young university women. Further studies about this topic are needed also involving university students from other degree courses to understand any differences regarding the prevalence of FSDs and the related factors. Moreover, our results suggest the importance to conduct further studies on women with non-heterosexual orientations to investigate the prevalence of sexual dysfunctions and sexually related distress in these groups.

According to our data, we strongly encourage the need for adequate training of healthcare professionals, in particular those working in the field of gynecology and women's health, about the management of problems related to sexuality in young women.

Disclosure statement

No potential conflict of interest was reported by the authors.

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